

Qt gi qp'Qegcp'Rqrlc{ 'Cf xkqt{ 'Eqwpekl'

F tchl'O ggkpi 'Ci gpf c, "

F gego dgt '5^{ff}. '4237"

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, Rngcug'pqvg'y cv'y ku'ci gpf c'ku'cp'cwgo r v'q'i kxg'pqveg'qh'y g'kpvpgf gf 'ugs wpeg'qh'gxgpw'cv'y g'o ggkpi 0"Vko g"
qt'qr leu'o c{ 'ej cpi g'wr 'vq'yj g'ncuv'o kpwg0"Vj g'Ej ckt'y kn't { 'vq'o cng'uwtg'y cv'y gtg'ku'cp'qr r qtwpkv{ 'hqt'r wdrle"
eqo o gpv'r tkqt "q'QRCE"o cnkpi "o clqt'r qrlc{ 'f gekukpu0"Vj g'o quvt gegpvt 'wr f cvgf 'f tchl'ci gpf c'y knldg'r quvgf "cv"
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"

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Rqt v'qhl'Vkrco qqniDc{ "'Qhlegu'o gu'J cni~823: 'J cpi ct 'Tf "'Vkrco qqm'QT', 9363"

"

- 32-22"co " O go dgt "kvtqf wevkpu"o "Ueqw'O eO wmgp"*QRCE'Ej ckt+"
"
- 32-27"co " Tgxkgy 'cpf 'Cr r tqxcn'qh'O ggkpi "Uwo o ct { 'qh'O c{ ". '4237"QRCE'O ggkpi "32"o kp+"o"
" Ueqw'O eO wmgp"*QRCE'Ej ckt+."Eqwpekl'O go dgtu"
"
- 32-37"co " Wf cvgu'htqo 'y g'I qxgtpqtai'Qhleg"*37"o kp+"o "I cdtkgr 'I qf hct d'y kn'r tqxkf g"qegcp"
" tgrcvgf 'wr f cvgu'htqo 'y g'I qxgtpqtai'Qhleg"
"
- 32-52"co " QRCE'Xkukqkpi 'Gz gtekug'o "Hcekkcvgf 'd { "Rcv'Eqt eqt cp"qh'Qtgi qp "Ugc'I tcpv"
"
- 34-22"r o " , , "Y qtnkpi "Nwpej "82"o kp+, , "QRCE'Xkukqkpi 'Gz gtekug"*Eqpvkpwgf +"
"
- 3-22"r o " Rwdrlc'Ego o gpv"*52"o kp+"o "Ueqw'O eO wmgp"o'y kn'eqqtf kpcvg'c'r wdrle"eqo o gpv'r gtlqf "
"
- 3-52"r o " QRCE'Xkukqkpi 'Gz gtekug"*Eqpvkpwgf +"
" ""
- 4-67"r o " Dtgcni*37"o kp+"
"
- 5-22"r o " O ctkpg'T gugt xgu'Rt gupv'kqp"cpf 'F kuewukqp"*82"o kp+"o "Et kmgp 'F qp"*QF HY + 'y kn'
" r tqxkf g'c'r t gupv'kqp"qp'ko r ngo gpv'kqp"qh'y g'O ctkpg'T gugt xgu'Rtqi tco "kpenmf kpi <c"
" ukgt'gr qt v'qp'Ecudef g'J gcf =uj qy ecug't guctej "qp'O qf gkpi 'y g'Geppqo ke'K6 r cew'qh'
" Hkuj kpi "T gutk'v'kpu="cpf "Rtqxkf kpi "Vtcur ctgpe { 0'
"
- 6-22"r o " Qtgi qp'O ctkpg'T gugt xgu'Rct v'p'gtuj kr "Rt gupv'kqp"*37"o kp+"o "Nkuc 'F gdt w'f engt g'y kn'i kxg"
" c'uj qt v'r t gupv'kqp"qp'yj g'Rct v'p'gtuj kr ai'cev'k'k'kgu0"
"
- 6-37"r o " Hwwt g'O ggkpi u"*37"o kp+"o "Ueqw'O eO wmgp"*QRCE'Ej ckt +y kn'rgcf "c'f kuewukqp"qp"
" uej gf w'kpi "qh'hwwt g'o ggkpi u"
"
- 6-52"r o " Cf lqwt p"
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, , 'Rtqxkf gf 'qpn' hqt'QRCE'O go dgtu'cpf 'Uchh0"Vj g'r wdrle'ku'y grego g'v'q'dt kpi "c'ucen'hwpej 'kh'y g{ 'f gult g0 , "

Qt gi qp'Qegcp'Rqrke { 'Cf xluqt { 'Eqwpekl' F tch'O ggvkpi 'Uwo o ct { '6'F ge'5tf . '4237' ""

KuugwF gelf gf IRqukvkpu'Vcngp''

- Vj g'F tch'O ggvkpi 'Uwo o ct { 'qh'vj g'O c { '9. '4237'Qegcp'Rqrke { 'Cf xluqt { 'Eqwpekl'QRCE+' y cu'cr r tqxgf 'd { 'eqpugpuwu'y kj qw'gf ku0''
- Vj g'Eqwpekl'cr r tqxgf 'd { 'eqpugpuwu'c'o qv'kq'v'j' c'xg'vj g'gzgewkxg'eqo o kwgg'f tch'c'rgwgt'' v'NEFE'tgeqo o gpf kpi 'vj cv'v'rgcu'qpg'NEFE'Ego o kuukap'O go dgt'j' c'xg'hpqy r'f i g'qh' Qtgi qp'qegcp'kuugw0''
- Vj g'Eqwpekl'cr r tqxgf 'd { 'eqpugpuwu'vj g'gucdrkuj o gpv'qh'cf'j' qe'y qtni' tqw u'v'q'dgi kp'kpkcn' eqpxgtucv'kpu'qp'vj g'kuugw'qh'O ct'kpg'F gdtku.'Qegcp'Cekf h'kecvkq'.'cpf 'Tguk'k'gpeg0''Vj g'cf' j qe'y qtni' tqw u'ctg'vcungf 'y kj 'f tch'kpi 'cp'cr r tqcej 'vj cv'QRCE'ecp'wug'v'q'cf f t'guu'vj g' kuugw'cdq'xg0''
- Vj g'Eqwpekl'cmuq'cr r tqxgf 'lp'vj g'uco g'eqpugpuwu'o qv'kq'cu'k'ungf 'cdq'xg.'vj g'tg/gucdrkuo gpv' qh'vj g'Vgttkqtkcn'Ugc'R'rcp'Y qtnkpi 'I' tqw 'v'q'cf f t'guu'vj g'Tqem'Uj qt'gu'k'x'gpvt { 'r qt'v'kq'qh' vj g'R'rcp0''

Rt gupvcv'kpu''

- Nqwkug'Uqmkf c { . 'Qegcp'Uek'peg'Vt wu'Gz'gewkxg'F k'gev't' r tqxkf gf 'QRCE'cp'k'p'tqf v'ek'v'q'vj g'Qegcp'Uek'peg'Vt wu0''
- Et'k'ngp'F'qp.'QFHY' 'O ct'kpg'T'gugt'xgu'Rt'qi' tco . 'Ngc'f'gt' r tqxkf gf 'c'r t'gugpvcv'kq'vj g' ko r rgo gpvcv'kq'qh'vj g'O ct'kpg'T'gugt'xgu'Rt'qi' tco . 'k'p'ew'f'kpi <'c't'gr q'tv'q'vj g'o q'pk'qtkpi 'y qtni' cv'E'cu'ec'f'g'J' gcf =vj g'wug'qh'u'qekcn'uel'g'peg'o g'y qf u'k'p'w'p'f'gt'uc'p'f'kpi 'eqo o w'p'k'v'ko r'cew=' cpf 'vj g'p'gy 'eqo o w'p'k'ec'v'kq'w't'c'v'gi { 'cpf 'g'h'q't'w0''
- Nkuc'F'gdt'w'f'eng't'g'.'QOTR'Rt'ql'gev'E'q'q't'f'k'p'c'v'q't' r tqxkf gf 'c'r t'gugpvcv'kq'qp'vj g'Qtgi qp' O ct'kpg'T'gugt'xgu'R'ct'v'p'gt'uj'kr' h'q'to'cv'kq'cpf'ce'v'k'k'ku0''

QRCE'O go dgtu'CWgpf cpeg''

O go dgtu'Rt gupv'x'q'k'pi +<'U'eqw'O eO wngp'P'qt'vj 'Eqcu'v'Eqo o g'tekcn'H'kuj'gt'kgu.'QRCE'Ej'ct'v'=
F'cx'lf' 'Cngp'Eqcu'cn'Ek'v'Q'h'hekcn: 'QRCE'x'leg'ej'ct'v'=
L'gpc'E'ct'v'gt'U'c'v'gy'kf'g'Eq'pugt'x'c'v'kq'qt'
G'p'x'k't'q'p'o'g'p'v'cn'Q'ti'c'p'k'c'v'kq'=
T'q'd'lp'J'ct'v'o'c'pp'Eqcu'cn'Eq'pugt'x'c'v'kq'qt'G'p'x'k't'q'p'o'g'p'v'cn'
Q'ti'c'p'k'c'v'kq'=
Y'c'ng't'E'j'w'em'R'qt'u.'O'ct'k'p'g'V't'c'p'ur'q't'v'k'q'p.'P'c'x'k'i'c'v'kq'=
V'g't't { 'V'j'q'o'r'u'q'p'
P'q't'v'j'Eqcu'cn'Eq'w'p'v'Eqo o k'u'k'q'p'g't'=
L'q'j'p'J'q'm'y'c { 'P'q't'v'j'Eqcu'v'E'j'ct'v'gt.'U'r'q't'v'q't'
T'g'et'g'c'v'k'q'p'cn'H'kuj'gt'kgu'=
U'w'uc'p'O'q't'i'c'p'U'q'w'j'Eqcu'cn'Eq'w'p'v'Eqo o k'u'k'q'p'g't'=
E'j'c't'ng'R'f'd'q'p'
Eqcu'cn'P'q'p/H'kuj'k'pi' T'g'et'g'c'v'k'q'p'+0'D't'c'f' 'R'g'w'k'p'i'g't'U'q'w'j'Eqcu'v'Eqo o g'tekcn'H'kuj'gt'kgu'+]32B6_''

O go dgtu'Cdugp'v'<T'q'd'gt'v'M'g'p'w'c'Qtgi qp'Eqcu'cn'k'p'f'k'p'V't'k'd'gu'=
L'o'R'gz'U'q'w'j'Eqcu'v'
E'j'c't'v'gt.'U'r'q't'v'q't' T'g'et'g'c'v'k'q'p'cn'H'kuj'gt'kgu+'

O go dgtu'Rt gupv'g'z'q'h'h'ek'q'<'I'c'd't'lg'n'I'q'f'h'c't'd'Q'h'h'eg'qh'vj g'I'q'x'g't'p'q't'=
N'q't'g'p'I'q'f'c't'f'
Qtgi qp'Eqcu'cn'q'p'g'O'c'p'ci'go'g'p'v'c'u'u'q'ek'v'k'q'p'=
R'c'w'f'U'p'q'y'F'g'r'c't'v'o'g'p'v'q'h'N'c'p'f'
Eq'pugt'x'c'v'k'q'p'('F'g'x'g'n'r'o'g'p'v'=
U'j'g'u'd { 'Y'c'm'g't'Qtgi qp'U'g'c'I't'c'p'v'=
E'j't'k'u'E'cu'v'g'n'k'
F'g'r'c't'v'o'g'p'v'q'h'U'c'v'g'N'c'p'f'u'=
E'c't'g'p'D't'c'd { 'Qtgi qp'F'g'r'c't'v'o'g'p'v'q'h'H'kuj'('Y'k'f'ri'h'g'=
L'g'p'p'h'g't'
R'w't'eg'n'i'Qtgi qp'F'g'r'v'q'h'G'p'x'k't'q'p'o'g'p'v'cn'S'w'c'k'v'f'=
N'c'w't'g'u'd'k'u'o'c'pp'QR'F'F'+0]: B3_''

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Uch<"Re wiMret lp"*F NEF +=Cpf { 'Ncpkgt '*F NEF . 'QRCE 'Uch+=F cxg'Hqz '*QF HY +=Mgulpc'
Ngg'*I P TQ +=Mgng{ 'Cf nkuqp '*QF HY +0'
"

Rwdre'Ego o gpv'cpf 'Cwgpf cpeg'

Rwdre'Ego o gpv'ur gcngtu*y kj "chhkc vqp'lh'r tqxkf gf +<F cxlf '[co co qvq'*ekk gp."Vkmco qqm'
Eqwpv{ +=F cxlf 'Dt qeniUo kj '*Ewt { 'Eqwpv{ +=Qppq'J wulpi '*Nkpeqp'Eqwpv{ +'
"

Qv'gtu'lp'Cwgpf cpeg*y kj "chhkc vqp'lh'r tqxkf gf +<'Nqwkug'Uqnf c { '*Qegcp'Uekpep'Vt wuv+=I wu'
O g{ gt '*HCEV+=Lo 'Ect nqp'*Eqcu/Tcpi g'Cuqekc vqp+=Nlpf c'Dwgm'*HCEV+=T qd'Dqxgw'
*Cuqekc vqp'qh'Qtgi qp'Eqwpvku+=Nkuc'F gdtw{ engtg"
"

Cetqp{ o u'cpf "kpkkn<"

F NEF /F gr ctwo gpv'qh'Ncpf 'Eqpugtxcvqp'cpf 'F gxgnr o gpv=FI CO K'Qtgi qp'F gr ctwo gpv'qh'I gqmi { "
cpf 'O kpgten'kpf wutlgu=F UN'/F gr ctwo gpv'qh'Ucvg'Ncpf u=QOF 'o'Qtgi qp'O kkket { 'F gr ctwo gpv=QF HY /
Qtgi qp'F gr ctwo gpv'qh'Hkuj 'cpf 'Y kfr klg=QRTF /Qtgi qp'F gr ctwo gpv'qh'Rctm'cpf 'Tgetgc vqp=F QL'o'
F gr ctwo gpv'qh'Lvuleg=HCEV/Hkuj gto gpai'Cf xkuqt { 'Ego o kwgg'qh'Vkmco qqm'Y EI C'o'Y guv'Eqcu'
I qxgtpqtu'Crnkpeg=VP E'o'Vj g'P cwtg'Eqpugtxcpe { "
"

F hwt kd wgf 'O cvgt kni'

- 30 QRCE'O c { '9.'4237'/'F tchn'O ggvpi 'Uwo o ct { ""
- 40 QRCE'Xkukqpkpi 'Gz gtekug'Y qtmuj ggv'
- 50 Qtgi qp'Uj qtgu'Utevgi ke'Rrcppkpi 'hqt'Tqemf 'Uj qtgu'O go q"

Cf f kkpcri'T guqwt egu'

- 30 [F gr ctwo gpv'qh'Ncpf 'Eqpugtxcvqp'cpf 'F gxgnr o gpv'Y gdukug](#)"
*j wr <ly y y Qrtgi qp0 qx lref l'+""
- 40 [QRCE'Y gdukug](#)<*j wr <ly y y Qrtgi qp0 qx INEF QRCE+"

Xlf gq'kpf gz"

Item	Disc #,
Y graqo g'cpf "kvtqf wexkpu"	3"
Tgxky 'cpf 'Crr tqxcl'qh'F tchn'O ggvpi 'Uwo o ct { '*F ku'30'	3"
I qxgtpqtai'Qhleg'Wf cvgu"	3"
QRCE'Xkukqpkpi 'Gz gtekug"	3.'4.'"
Rwdre'Ego o gpv'	4"
QRCE'Xkukqpkpi 'Gz gtekug'*eqpv0'	5"
O ctkpg'T gugt xgu'Rt gupvc vqp"	6"
Qtgi qp'O ctkpg'T gugt xgu'Rct vpgtuj kr 'Rt gupvc vqp"	6"

Hqt 'c'eqr { 'qhl'y g'xkf gq't geqt f 'qhl'y ku'o ggvpi . 'r rncug'eqpwev'Cpf { 'Ncpkgt 'cv'y g'eqpwev'
kplqt o cvkqp'khwgf 'dgrqy . 'cpf 'eqo rrvvg'c 'r wdrke 't geqt f u't gs wgu'cxc krc drg'qprkpg'cv<'"
[j wr <ly y y Qrtgi qp0 qx INEF j qeulr wdrkecvkpuF Oa33204aRwdreCee guag F NEF T geqt f uaTgs wguHqt o 0fh](#)"
[Cpf { Ncpkgt B uacvg Qrt Guu](#)"*725 +; 56/2294"

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Oregon

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State Land Board

Kate Brown
Governor

Jeanne P. Atkins
Secretary of State

Ted Wheeler
State Treasurer

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CWtcVYf`% ž&\$%)`.
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GI 6>97H'

Appointment of five (5) voting members to the Oregon Ocean Science Trust (Trust) by the State Land Board.

=GI 9'

Whether the Land Board should appoint the recommended voting members to the Trust.

5I H<CF#M

Oregon Constitution, Article VIII, Section 5

ORS 196.565; regarding appointment of the Ocean Science Trust

ORS 183; regarding administrative procedures and rules of state agencies

ORS 273; regarding the creation and general powers of the Land Board

ORS 274; regarding submerged and submersible lands in general

657?; FCI B8'

At the October 8, 2013 regular meeting, the Land Board directed the Department to make recommendations for appointments of voting members to the Oregon Ocean Science Trust, which would be presented to the Board at their December 2013 meeting (Appendix A).

Soon after the October 2013 Land Board meeting, the Department was informed that legislation was being introduced to amend some of the requirements of the Trust and Trust membership. As a result of this legislation, the Department suspended its work on finding and recommending voting members to the Trust. Senate Bill 1545 (Appendix B) was introduced and passed during the 2014 legislative session. The Department has

worked with the Governor's Natural Resources Office as well as interested legislators since the 2014 session to identify appropriate candidates for the Trust.

HFI GH'8I H9G'5B8`JCHB; `A9A69F`F9EI `F9A9BHG`

The duties of the Trust include:

1. Promote peer-reviewed, competitive research and monitoring that leads to increased knowledge and understanding of Oregon's ocean and coastal resources;
2. Promote innovative, collaborative, community-oriented, multi-institutional approaches to research and monitoring related to Oregon's ocean and coastal resources;
3. Enhance this state's capacity for peer-reviewed scientific ocean and coastal research; and
4. Subject to available funding, establish and execute a competitive grant program to conduct research and monitoring related to Oregon's ocean and coastal resources.

The Trust is also responsible for submitting a report to the Legislative Assembly by March 31 of each even-numbered year. The report shall describe the progress of the Trust in carrying out its duties, and may include relevant issues and trends of significance, including emerging scientific research and public policy.

Pursuant to the amendments created by SB 1545, the Trust is comprised of seven members. The Land Board is required to appoint the five voting members to the Trust (The President of the Senate and the Speaker of the House appoint one member from each respective chamber).

Voting members need to be residents of this state who demonstrate a commitment and interest in the stewardship of Oregon's ocean and coastal resources; and have not less than five years of experience in competitive granting, marine science, foundations or fiscal assurance.

The term of office of each voting member is four years, but a voting member serves at the pleasure of the Board. Before the expiration of the term of a voting member, the Board shall appoint a successor whose term begins on January 1 next following. A voting member is eligible for reappointment. If there is a vacancy for any cause, the Board shall make an appointment to become immediately effective for the unexpired term.

Section 6 of Senate Bill 737 (Appendix A) directs the appointments to be staggered, with two voting members to serve for a term ending December 31, 2014; and the other three voting members to serve for a term ending December 31, 2015. In order to meet the requirements of the 2013 law, the Department recommends that the Board appoint two voting members to serve for a term ending December 31, 2018; and three voting

members to be appointed for a term ending December 31, 2015, with a recommendation to immediately reappoint these three voting members to a full four-year term that will end on December 31, 2019.

HFI GH'BCA-B99G'

The Governor's Natural Resources Office has coordinated with the Department in selecting nominees to serve on the Trust based on their background and the requirements of ORS 196.565. Below are the nominees for the Board's consideration.

Louise Solliday, retired, former Department of State Lands Director and Governor's natural resources policy advisor (Tidewater, OR).

Laura Anderson, Owner, Local Ocean Seafood and Commissioner, Oregon Fish and Wildlife Commission (Newport, OR).

Emily Goodwin, Executive Director, Cascade Mountain School and former foundation ocean program officer (Hood River, OR).

Jim Sumich, Ph.D., retired, former professor of marine biology and zoology at Grossmont Community College (CA), marine mammal expert and marine biology textbook author (Corvallis, OR).

Krystyna Wolniakowski, Executive Director, Columbia River Gorge Commission and former director, northwest region, National Fish and Wildlife Foundation. (Lake Oswego, OR).

F97CAA9B85HCB'

The Department recommends that the State Land Board appoint the following individuals to the Trust as voting members:

- **@i fU5bXYfgcb** – recommendation of appointment for a term ending December 31, 2015, and reappointment for a 4-year term ending December 31, 2019.
- **9a]mi; ccXk]b** – recommendation of appointment for a term ending December 31, 2018.
- **@i]gY'Gc`]XUm** – recommendation of appointment for a term ending December 31, 2015, and reappointment for a 4-year term ending December 31, 2019.
- **>]a `Gi a]W** – recommendation of appointment for a term ending December 31, 2018.
- **? fng]mbUK c`b]U_ck g_]** – recommendation of appointment for a term ending December 31, 2015, and reappointment for a 4-year term ending December 31, 2019.

5DD9B87-9G'

- A. State Land Board Agenda Item 1e from the October 8, 2013 Regular Meeting
- B. SB 1545, Oregon Laws 2014



Oregon

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G'hU'hY'' @U'b'X''6 'c'Uf'X'

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CWcVYf', ž&\$%'
5 [YbXU=Hya 'a'

GI 6>97H'

Appointment of the Oregon Ocean Science Trust (Trust) by the State Land Board.

=GI 9'

Whether the Land Board should direct the Department to move forward with recommendations for the appointment of trust members.

5I H<CF=IM

Oregon Constitution, Article VIII, Section 5

ORS 183; regarding administrative procedures and rules of state agencies

ORS 273; regarding the creation and general powers of the Land Board

ORS 274; regarding submerged and submersible lands in general

Oregon Laws 776

657?; FCI B8'

Senate Bill 737 was signed into law on August 14, 2013. This bill establishes the Oregon Ocean Science Trust and Fund. The Board is responsible for appointing the 5 member Trust.

The duties of the Trust are to:

- Promote peer-reviewed, competitive research and monitoring that leads to increased knowledge and understanding of Oregon's ocean and coastal resources;
- Promote innovative, collaborative, community-oriented, multi-institutional approaches to research and monitoring related to Oregon's ocean and coastal resources;

- Enhance this state's capacity for peer-reviewed scientific ocean and coastal research; and
- Subject to available funding, establish and execute a competitive grant program to conduct research and monitoring related to Oregon's ocean and coastal resources.

In order to qualify for appointment to the Trust, members must:

- Be residents of this state who demonstrate a commitment and interest in the stewardship of Oregon's ocean and coastal resources; and
- Have not less than five years' experience in competitive granting, marine science, foundations or fiscal assurance.

The first term of the Trust is staggered. Two serve for a term ending December 31, 2014; and three serve for a term ending December 31, 2015. The term of office for each member henceforth is four years, but members serve at the pleasure of the Board. Before the expiration of the term of a member, the Board shall appoint a successor whose term begins on January 1 of the following year. A member is eligible for reappointment. If there is a vacancy for any cause, the Board shall make an appointment to become immediately effective for the remainder of the term.

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The Department recommends that the Land Board direct the Department to move forward with recommendations for appointments to the Oregon Ocean Science Trust, to be presented to the Board at their December 2013 meeting.

5DD9B8L

A. Enrolled Senate Bill 737

77th OREGON LEGISLATIVE ASSEMBLY--2013 Regular Session

Enrolled
Senate Bill 737

Sponsored by Senator ROBLAN; Senators JOHNSON, KRUSE, WHITSETT

CHAPTER

AN ACT

Relating to ocean resources; appropriating money; and declaring an emergency.

Be It Enacted by the People of the State of Oregon:

OREGON OCEAN SCIENCE TRUST

SECTION 1. (1) The Oregon Ocean Science Trust is established, consisting of five members appointed by the State Land Board.

(2) The term of office of each member is four years, but a member serves at the pleasure of the board. Before the expiration of the term of a member, the board shall appoint a successor whose term begins on January 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the board shall make an appointment to become immediately effective for the unexpired term.

(3) The members specified in subsection (1) of this section must:

(a) Be residents of this state who demonstrate a commitment and interest in the stewardship of Oregon's ocean and coastal resources; and

(b) Have not less than five years' experience in competitive granting, marine science, foundations or fiscal assurance.

(4) A majority of the members of the trust constitutes a quorum for the transaction of business.

(5) The trust shall select one of its members to be the executive director of the trust, for such terms and with the duties and powers that the trust determines are necessary for the performance of the office.

(6) The trust shall meet at least twice each year at a place, day and hour determined by the trust. The trust may also meet at other times and places specified by the call of the executive director or of a majority of the members of the trust.

(7) The trust may adopt any rules necessary to carry out the duties of the trust.

(8) Members of the trust are not entitled to compensation or reimbursement for expenses and serve as volunteers for the trust.

(9) The Department of State Lands shall provide a facility and administrative support for the meetings of the trust as requested. Other agencies shall provide support as requested by the trust in order to provide the trust with assistance on the priority marine science needs of the state.

DUTIES OF THE TRUST

SECTION 2. The Oregon Ocean Science Trust shall:

- (1) Promote peer-reviewed, competitive research and monitoring that leads to increased knowledge and understanding of Oregon's ocean and coastal resources;
- (2) Promote innovative, collaborative, community-oriented, multi-institutional approaches to research and monitoring related to Oregon's ocean and coastal resources;
- (3) Enhance this state's capacity for peer-reviewed scientific ocean and coastal research; and
- (4) Subject to available funding, establish and execute a competitive grant program to conduct research and monitoring related to Oregon's ocean and coastal resources.

OREGON OCEAN SCIENCE FUND

SECTION 3. (1) The Oregon Ocean Science Fund is established in the State Treasury, separate and distinct from the General Fund. Interest earned by the Oregon Ocean Science Fund shall be credited to the fund. Moneys in the fund are continuously appropriated to the Oregon Ocean Science Trust for the purpose of carrying out the provisions of sections 1, 2, 4 and 5 of this 2013 Act.

(2) The trust may accept grants, donations, contributions or gifts from any source for deposit in the fund.

(3) The fund shall consist of:

- (a) Moneys accepted by the trust pursuant to subsection (2) of this section;
- (b) Moneys appropriated by the Legislative Assembly;
- (c) Interest earned on moneys in the fund; and
- (d) Any moneys described in subsection (4) of this section.

(4) Subject to and consistent with federal law, any moneys received by the State of Oregon from the federal government that constitute the state's distributive share of the amounts collected under the Outer Continental Shelf Lands Act, 43 U.S.C. 1331 et seq., shall be deposited in the fund.

(5) Of the moneys in the fund that are derived from the state's distributive share of the amounts collected under the Outer Continental Shelf Lands Act, 43 U.S.C. 1331 et seq., the coastal county adjacent to the lands containing tracts for which the moneys are received by the state shall receive 30 percent of the distributive share received by the state for those lands. Where the lands containing tracts for which moneys are received are located adjacent to more than one county of this state, each county adjacent to the lands shall receive a portion of the 30 percent allocation that is proportionate to the area of the lands that are adjacent to the county.

SECTION 4. (1) Moneys deposited in the Oregon Ocean Science Fund may be used to reimburse:

(a) The State Treasurer for the costs of administering the fund as provided in section 3 of this 2013 Act.

(b) The Department of State Lands for the costs of administering the Oregon Ocean Science Trust as provided in section 1 (9) of this 2013 Act.

(c) Other agencies for the costs of providing support to the trust as requested under section 1 (9) of this 2013 Act.

(2) The total amount of costs paid under this section may not exceed five percent of the total amount of moneys deposited in the fund during the biennium.

REPORT TO LEGISLATIVE ASSEMBLY

SECTION 5. The Oregon Ocean Science Trust shall submit a report to the Legislative Assembly, in the manner provided by ORS 192.245, by March 31 of each even-numbered year, describing the progress of the trust in carrying out its duties specified in section 2 of this

2013 Act. The report may include relevant issues and trends of significance, including emerging scientific research and public policy.

MISCELLANEOUS

SECTION 6. Notwithstanding the term of office specified by section 1 of this 2013 Act, of the members first appointed to the Oregon Ocean Science Trust:

- (1) Two shall serve for a term ending December 31, 2014.
(2) Three shall serve for a term ending December 31, 2015.

SECTION 7. The unit captions used in this 2013 Act are provided only for the convenience of the reader and do not become part of the statutory law of this state or express any legislative intent in the enactment of this 2013 Act.

EMERGENCY CLAUSE

SECTION 8. This 2013 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2013 Act takes effect on its passage.

Passed by Senate June 25, 2013

Robert Taylor, Secretary of Senate
Peter Courtney, President of Senate

Passed by House June 28, 2013

Tina Kotek, Speaker of House

Received by Governor:

M., 2013

Approved:

M., 2013

John Kitzhaber, Governor

Filed in Office of Secretary of State:

M., 2013

Kate Brown, Secretary of State

CHAPTER 2

AN ACT

SB 1545

Relating to the Oregon Ocean Science Trust; amending ORS 196.565 and 196.568; and declaring an emergency.

Be It Enacted by the People of the State of Oregon:

SECTION 1. ORS 196.565 is amended to read:

196.565. (1) The Oregon Ocean Science Trust is established, consisting of *[five]* **seven** members appointed *[by the State Land Board.]* **as follows:**

(a) **The President of the Senate shall appoint one member from among members of the Senate.**

(b) **The Speaker of the House of Representatives shall appoint one member from among members of the House of Representatives.**

(c) **The State Land Board shall appoint five members who:**

(A) **Are residents of this state who demonstrate a commitment and interest in the stewardship of Oregon's ocean and coastal resources; and**

(B) **Have not less than five years' experience in competitive granting, marine science, foundations or fiscal assurance.**

(2) The term of office of each **voting** member **appointed under subsection (1)(c) of this section** is four years, but a member serves at the pleasure of the board. Before the expiration of the term of a member, the board shall appoint a successor whose term begins on January 1 next following. A member is eligible for reappointment. If there is a vacancy for any cause, the board shall make an appointment to become immediately effective for the unexpired term.

[(3) The members specified in subsection (1) of this section must:]

[(a) Be residents of this state who demonstrate a commitment and interest in the stewardship of Oregon's ocean and coastal resources; and]

[(b) Have not less than five years' experience in competitive granting, marine science, foundations or fiscal assurance.]

[(4)] (3) A majority of the **voting** members of the trust constitutes a quorum for the transaction of business.

[(5)] (4) The trust shall select one of its **voting** members to be the executive director of the trust, for such terms and with the duties and powers that the trust determines are necessary for the performance of the office.

[(6)] (5) The trust shall meet at least twice each year at a place, day and hour determined by the trust. The trust may also meet at other times and places specified by the call of the executive director or of a majority of the **voting** members of the trust.

[(7)] (6) The trust may adopt any rules necessary to carry out the duties of the trust.

[(8) Members of the trust are not entitled to compensation or reimbursement for expenses and serve as volunteers for the trust.]

(7) **Members of the trust who are not members of the Legislative Assembly are not entitled to compensation, but may be reimbursed for actual and necessary travel and other expenses incurred by them in the performance of their official duties in the manner and amounts provided for in ORS 292.495. Claims for expenses incurred in performing functions of the trust shall be paid out of funds appropriated to the Department of State Lands for purposes of administering the trust.**

(8) **Members of the Legislative Assembly appointed to the trust are nonvoting members of the trust and may act in an advisory capacity only.**

(9) The Department of State Lands shall provide a facility and administrative support for the meetings of the trust as requested. Other agencies shall provide support as requested by the trust in order to provide the trust with assistance on the priority marine science needs of the state.

SECTION 2. ORS 196.568 is amended to read:

196.568. (1) Moneys deposited in the Oregon Ocean Science Fund may be used to reimburse:

(a) The State Treasurer for the costs of administering the fund as provided in ORS 196.567.

(b) The Department of State Lands for the costs of administering the Oregon Ocean Science Trust as provided in ORS 196.565 **(7) and (9).**

(c) Other agencies for the costs of providing support to the trust as requested under ORS 196.565 (9).

(2) The total amount of costs paid under this section may not exceed five percent of the total amount of moneys deposited in the fund during the biennium.

SECTION 3. This 2014 Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this 2014 Act takes effect on its passage.

Approved by the Governor February 26, 2014

Filed in the office of Secretary of State February 26, 2014

Effective date February 26, 2014

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Oceangoing Research Vessel Program

2013-15 Biennium Report



Oceangoing Research Vessel Program

During the 2013 legislative session, the Oregon Legislative Assembly enacted HB 3451 which established an Oceangoing Research Vessel Program at Oregon State University to assist in the research and study of the waters of the Pacific Coast. This state-funded program provides ship days to students and researchers from all of Oregon's public universities and natural resource agencies for the use of the R/V Oceanus to explore key coastal issues, including climate change impacts, ocean acidification and renewable energy. During the 2013-15 biennium, the multi-institutional Research Vessel Council enabled by the bill approved three proposals.

As required by the bill, this report provides a summary of the scholarly findings and research conducted:

“Undergraduate Student Learning Opportunities During a Multidisciplinary Study of the Umpqua Shelf Depocenter” led by Dr. Rob Wheatcroft (OSU) during March 24-27, 2015. Dr. Wheatcroft used four days of ship time to provide field-based experiential learning opportunities for ten OSU undergraduate students and to gather samples and data on the ecology, biogeochemistry and geology of the Oregon margin.

Students helped to understand how sediment is deposited offshore of the Umpqua River and may influence the Oregon shoreline in that region. The following data and samples were collected and are being analyzed: benthic infauna, sediment cores, zooplankton, and vertical profiles of temperature, salinity chlorophyll fluorescence, dissolved oxygen, and light transmission throughout the water column.

“Building Effective Marine Reserve Monitoring Through Research and Education” led by Dr. Angelicque White (OSU) during April 8-12, 2014. Dr. White used four days of ship time to provide field-based experiential learning opportunities for 8 graduates and 3 undergraduates from Oregon State University, the University of Oregon, and Clatsop Community College, and to collect data on the physical and biological variability in and near the Cape Perpetua Marine Reserve. Recently, the Cape Perpetua region has been subject to recurring summertime low-oxygen conditions. The ship days enhanced graduate courses on methods of oceanographic sampling.

A wide range of oceanographic sampling platforms was used including shipboard Acoustic Doppler Current Profilers, Conductivity(salinity)-Temperature-Depth sensors, surface flow-through instrumentation for high resolution measurement of phytoplankton biomass, an autonomous underwater glider, a hyperspectral radiometer for measurement of the euphotic depth, and the sampling equipment necessary for collection and storage of discrete samples for extracted chlorophyll, particles, inorganic carbon and nutrients.

Council Members

- Jack Barth, Oregon State University
- Caren Braby, Oregon Department of Fish and Wildlife
- Paul Klarin, Oregon Department of Land Conservation and Development
- Vicki McConnell, Oregon Department of Geology and Mineral Industries
- Greg Pettit, Oregon Department of Environmental Quality
- Kristen Wilkin, Clatsop Community College
- Craig Young, University of Oregon
- Stewart Lamerdin, Oregon State University
- Wade Blake, NOAA Marine Operations Center



“The one week volunteering on Dr. Goldfinger’s research vessel marks the most pivotal moments of my college career. I am currently working on a senior thesis investigating the level of shaking across Oregon and Washington during large earthquakes events within the past ~15,000 years. I had the pleasure of presenting this work in Zurich this summer at a Paleoseismology conference and will also present at the American Geophysical Union Fall Meeting in December. Dr. Goldfinger and his colleagues have inspired me to start a non-profit organization called the Cascadia Earthquake Initiative to help Oregonians access personalized resources necessary to prepare for a Cascadia quake.”

-Rachel Hausmann, Portland, Ore.

“Geophysical and Geotechnical Investigations to Enable Embedment Anchor Installations in Oregon Wave Energy Study Areas” led by Dr. Chris Goldfinger (OSU) during March 10-13, 2015. Dr. Goldfinger used four days of ship time to conduct seafloor mapping, sub-bottom profiling and coring in support of the Northwest National Marine Renewable Energy Center’s wave energy test site development. A “Marine Field Camp” for 6 OSU geology and geophysics students also provided training in cruise planning, weather strategy, ship operations, paleoseismology, wave energy siting and cable routing, paleoclimate, marine geology, coring, sub-bottom profiling and associated geophysics. One of the undergraduates is from Coos Bay, Oregon, and another, Rachel Hausmann, is using the cruise paleoseismic data in a talk she is presenting at the American Geophysical Union meeting in San Francisco in December, 2015.

The students also conducted geophysical surveys off Seal Rock and Camp Rilea and conducted a “chirp subbottom survey” using the R/V Oceanus 3.5-kHz system, a small boat sub-bottom survey inshore, surface seafloor sampling with a grab sampler, and gravity sediment coring. Three 4-inch gravity cores were collected in two slope basins on the northern Oregon margin, targeted on the lower continental slope to help fill a large gap on core coverage for paleoseismic purposes on the northern Oregon margin.

All three of these cruises also collected standard meteorological (winds, air temperature, etc.) and oceanographic (bottom depth, surface temperature and salinity, water column velocities) data as part of the R/V Oceanus data acquisition system. The majority of data collected during each of these cruises has been submitted to the national oceanographic and geological archive centers. Some samples remain that will require further post-processing and calibration before they are ready to archive.

Participating Institutions and Students

Institution	Undergraduate	Graduate
Oregon State University	17	5
University of Oregon		3
Clatsop Community College	2	
TOTAL = 27	19	8



Additional Research Needed

The three oceanographic research cruises funded during the 2013-2015 biennium spanned a wide range of physical, biological and geological oceanography. Given the importance of understanding ocean acidification in Oregon waters, additional chemical oceanography cruises are critical. These might include large-scale surveys of the entire Oregon shelf and slope, and/or targeted surveys across the shelf in certain locations to understand the link between offshore and nearshore ocean acidification levels.

The funded projects took place primarily off central Oregon. Future projects would ideally focus on south and south-central Oregon, while also returning to designated reference stations (e.g., along the Newport Hydrographic Line) to establish year-to-year variability.

Because the funded projects took place in spring, there is an obvious need for sampling in the other seasons, in particular in fall and winter, when we have the least amount of data. We are particularly excited to see measurements be made in 2016 as an El Niño is forecast for 2015-2016. Measurements in 2016 and 2017 will help document the longevity or dissipation of “the blob,” an unprecedented warming up to 4-6 degrees C (7-11 degrees F) of the upper ocean which started in fall 2015.

Analysis of Federal Funding

The majority of federal funding for the operation of the R/V Oceanus continues to come from the National Science Foundation (~80%), with small amounts of support from the Office of Naval Research and the Army Corp of Engineers. All of these funds are associated with individual principal investigator programs that may or may not match the intent of the Oceangoing Research Vessel Program as set forth in HB 3451 Section 1(1). An analysis of R/V Oceanus use shows that it operated for a total of 357 days during this biennium at a total cost of approximately \$8,925,000 (~\$25,000 per day), and that 304 (85%) of those days took place in “waters of the Pacific Coast” from Washington to Mexico. Of the total Pacific Coast days, two thirds were spent in Oregon waters (207 days at a cost of approximately \$5,175,000).

The state-funded Oceangoing Research Vessel Program is important for maintaining the partnership with federal agencies to continue federal investment in oceangoing research in Oregon coastal waters. Importantly, it positions Oregon, through Oregon State University, to be the operator of the next-generation Regional Class Research Vessel (RCRV) currently being designed by Oregon State University and planned for construction and launching by the end of this decade.



“Being able to actively learn how to utilize the shipboard equipment afforded me the confidence that oceanographic cruises are conceivably an imminent part of my future career path.”
- Coquille Rex, Wilderville, Ore.



“That trip taught me that I really love doing field work. I’m interested in becoming a marine technician, who is the person who goes between the crew of a ship and scientific researchers to make sure everyone is on the same page.”
-Genevieve Guevara, Newport, Ore.

December 8, 2015

PMEC-SETS COLLABORATIVE WORKGROUP MEETING

When We Last Met . . .

April 22
CWG

- Discussed draft PDEA
 - Project Description
 - BMP's
 - Monitoring Topics

May 14
EWG

- Monitoring
 - Proposed Plans
 - Additional Monitoring Topics

. . . Since then

May/June

- Received written feedback on PDEA and Monitoring Plans
- Conference call with ODFW to discuss comments on Project Description

Aug/Sept

- Conducted technical calls to discuss and incorporate feedback for Benthic and Acoustic

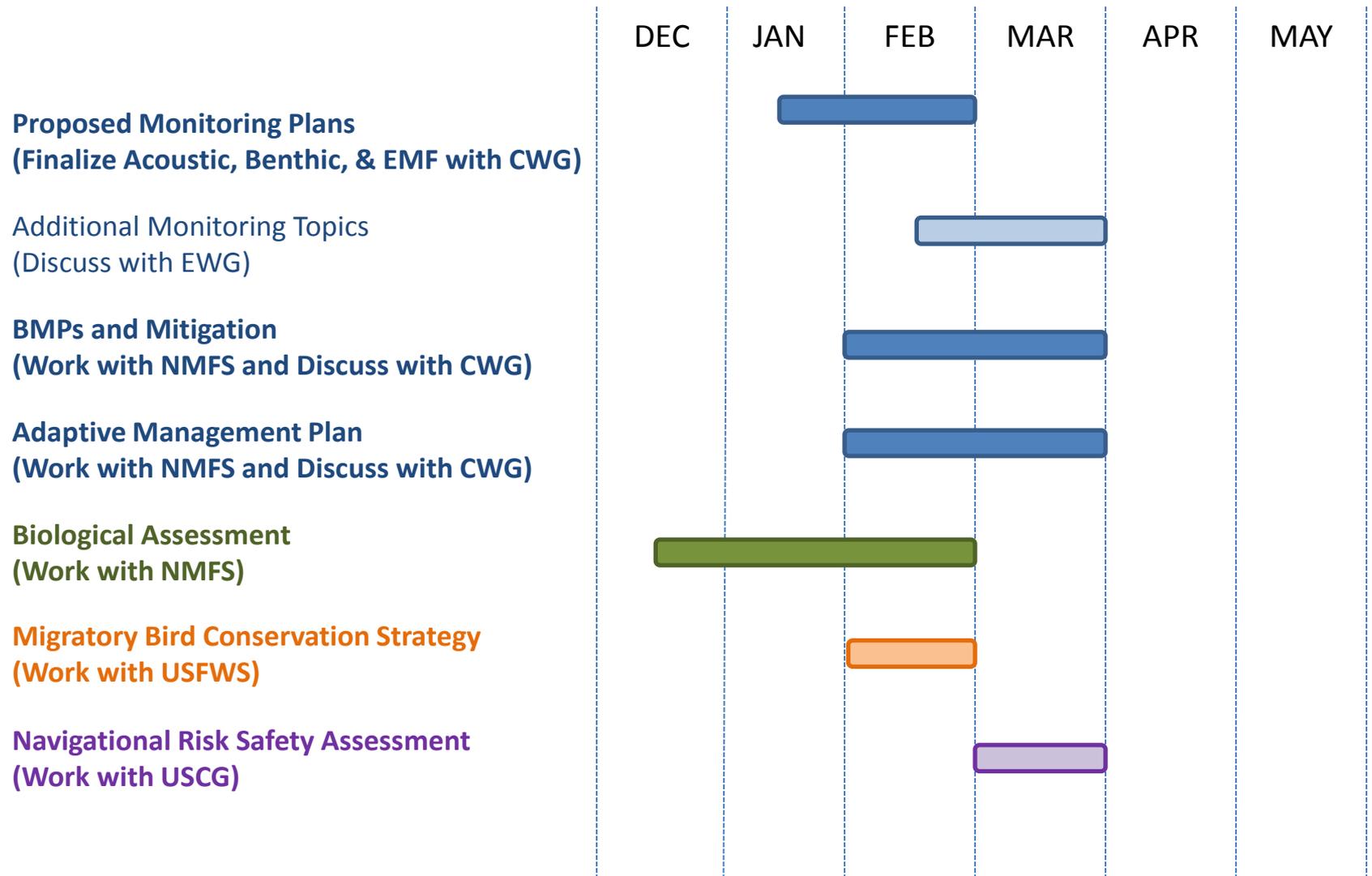
Dec

- Revised EMF and have shared feedback with commenters
- Finalize proposed Monitoring plans

Ongoing

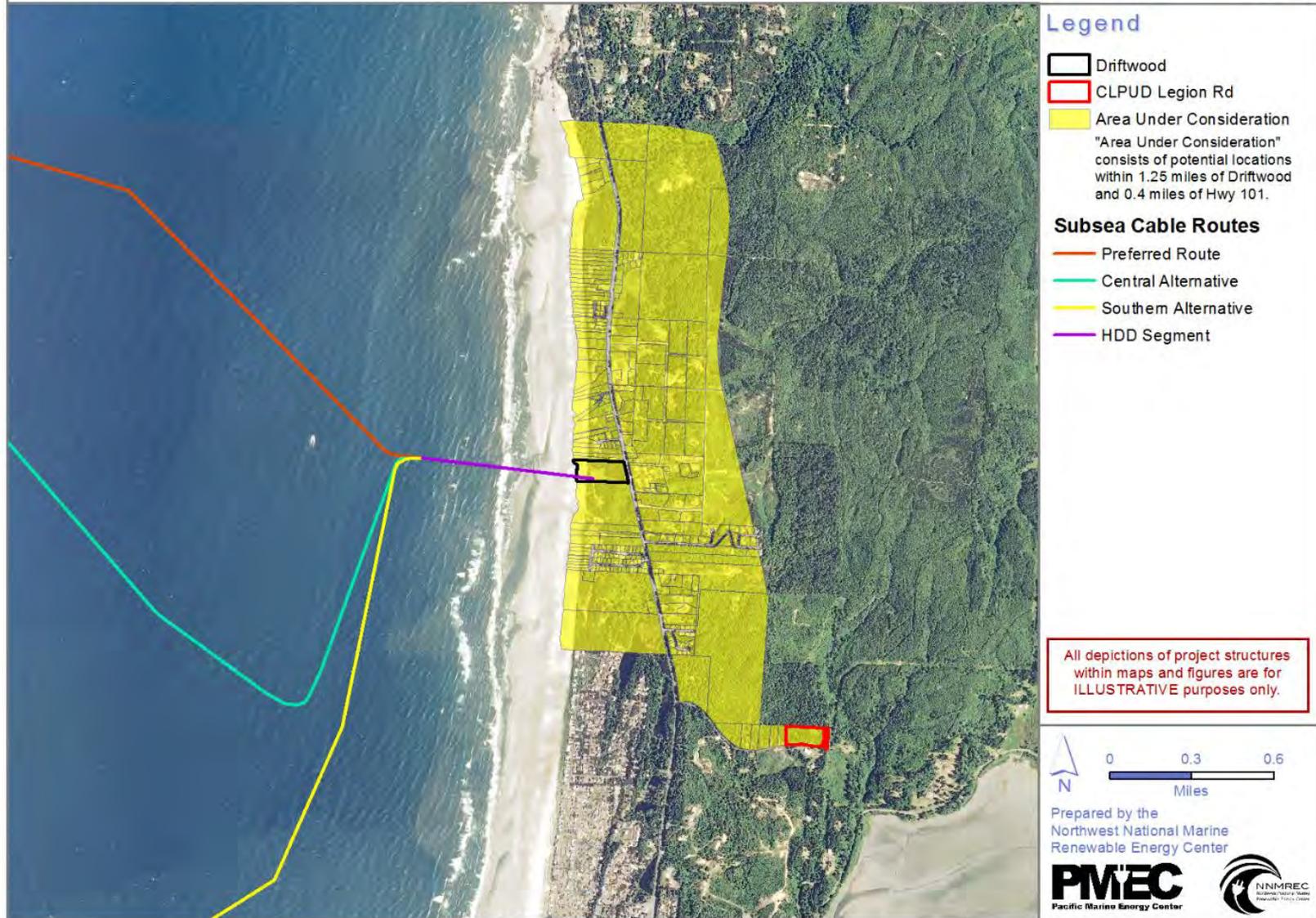
- Evaluating feedback on PDEA and additional monitoring topics

Next Steps



Cable Landing

Pacific Marine Energy Center - South Energy Test Site



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The Oregon Ocean Stewardship Area GLD Project

Oregon's interests in ocean resource policy and management are not limited to state waters. Because the ocean is part of a much larger regional marine ecosystem, ocean uses and activities that occur in federal waters may affect Oregon's coastal environment and communities. For this reason, in 1991, the State of Oregon defined an **Ocean Stewardship Area** in the Ocean Resources Management Plan as the area extending through the state's territorial sea out to the toe of the continental shelf.

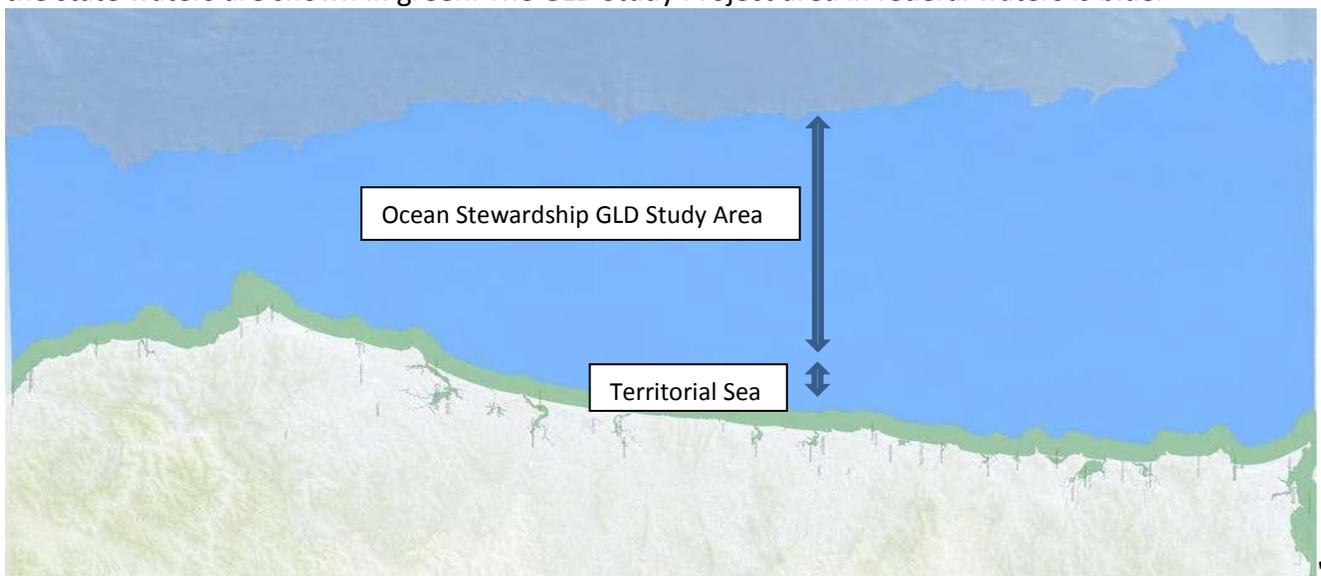
In September 2015, the National Oceanic and Atmospheric Administration (NOAA) approved a Geographic Location Description (GLD) within the Oregon Ocean Stewardship Area for federal activities related to marine renewable energy development. Federal approval of the GLD, and its incorporation into the Oregon Coastal Management Program (OCMP), is the successful culmination of a collaborative effort between those agencies taking several years. In addition to the GLD, the OCMP also updated the list of federal activities that will be reviewed for consistency with the enforceable policies of the OCMP.

What is a GLD and why did Oregon want one?

A GLD is a geographically specific area where listed federal license or permit activities have been demonstrated to have reasonably foreseeable effects on a states coastal uses or resources. The process for creating a GLD is prescribed by the federal consistency provisions of the Coastal Zone Management Act (CZMA). Oregon's GLD is designed to ensure that any marine renewable energy projects within the federal waters delineated by the GLD are automatically subject to the federal consistency review process, and ensures that those actions are consistent with the enforceable policies of a state's coastal management program.

Where is the GLD Study Area?

In the figure below, the Oregon Territorial Sea Plan (TSP) part of the Stewardship Area encompasses the state waters are shown in green. The GLD Study Project area in federal waters is blue.



"

"

How does the GLD work?

A GLD is based on a demonstration that there would be reasonably foreseeable coastal effects from the listed federal license or permit activity in the proposed area. Oregon's GLD applies specifically to federal activities related to marine renewable energy development; which includes leasing and permitting authorized by the federal Bureau of Ocean Energy Management (BOEM). The activities, such as authorizing a permit or lease, are automatically subject to federal consistency within the GLD.

"

What are the "enforceable policies" that would be used in the federal consistency review process?

Enforceable Policies are state policies that meet the definition of an enforceable policy under the CZMA and have been approved by NOAA for use in federal consistency reviews. The OCMP consists of a set of *enforceable policies*, including policies from Goal 19 Ocean Resources, the Territorial Sea Plan, and various other state agency authorities. These enforceable policies may be applied to certain federal actions that have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone through the federal consistency provisions of the CZMA. Basically, the federal agency must provide a determination that their actions are consistent with the state's enforceable policies.

Are there any projects that are within the GLD that will be subject to federal consistency review?

There are two projects currently seeking federal authorizations within the GLD, the Principle Power WindFloat project off of Coos Bay, and, the Northwest National Marine Renewable Energy Center's, Pacific Marine Renewable Energy Center near Newport.

For more information call: Paul Klarin (503) 934-0026 or email paul.klarin@state.or.us
Kris Wall (503) 231-2221 or email kris.wall@noaa.gov

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Rgto ku'cpf "h'egpugu'tgs wkt'gf "hqt'o ctk'p'g'j { f tqnk'p'g'le'r tq'lgew'r wtuwcpv'vq'vj g" Hgf gtcn'Rqy gt'Cev*38'WUE0EE'9; 4/: 45c="ko r ngo gpv'kpi "tgi w'v'k'pu'cv'3: " E(HOΓORctw'6'cpf "7+0'

"

FNEF "r tqr qugu'vj ku'cf f k'k'ap"vq'vj g'h'ku'dgecwug'r gto ku'cpf "h'egpugu'hqt'vj g'uk'k'pi ." eqput wevkap."cpf "qr gtcvkap"qh'o ctk'p'g'j { f tqnk'p'g'le'r tq'lgew'o c { "ch'ge'v'eqcucn'wugu'cpf " tguwtegu'qh'Qt'gi qp'au'eqcucn' qpg0"Hqt'r w'r qugu'qh'vj ku'h'k'k'pi ."o ctk'p'g'j { f tqnk'p'g'le" r tq'lgew'k'p'ew'f g'cp { "gz'k'k'pi "qt'h'w'wt'g'o ctk'p'g't'g'p'gy cdrg'gpgti { "v'ej p'q'q'i k'gu'vj cv" r tqf weg'gpgti { "wuk'pi "vj g'j' { f tqnk'p'g'le'r tqr g'v'ku'qh'vj g'o ctk'p'g'gp'x'k'q'po gpv'k'g'0'gpgti { " i gpgtcv'f "h'qo "vj g'o q'v'kap'qt'h'ny "qh'y cxgu."k'f'gu."qt'q'eg'cp"ew'tt'gpw+0'R'ng'cug'ugg'cd'qx'g" cpf "vj g'cee'qo r cp { k'pi "I gqi tcr j le"Nqecv'kap" f guet'k'v'kap'hqt'c'h'k'k'pi "cpf "c'p'cn'uk'qh'vj g" t'g'cu'q'p'cd'n' "hqt'gugg'cd'rg'gh'ge'w'0""""

"

Tgxlug<"

Rgto ku'cpf 'hēgpugu'tgs wktgf 'hqt'j { f tq/grgevtke'hcekrkv'uklpi 'cpf 'tcpuo kuukqp' rkpgu'r wtuwcpv'v'j g'Hgf gtcn'Rqy gt'Cev*38'WUUE0E9; 4'v': 45c+0'

"

Vj ku'gpvt { 'r t g x k q w u n { 't g h g t t g f 'v q'ōr qy gt 'r r p w'uklpi 'cpf 'tcpuo kuukqp' rkpgu'0'Vj g' co gpf o gpv'ur gekhgu'v'j g'v' r g'qh'r qy gt '*j { f tq/mkpge+.'cpf 'r tqxkf gu'c'rgi cni'ekcvkqp'v'q' vj g'Hgf gtcn'Rqy gt'Cev0''''''

"

Tgxlug<'

Egt wkecvgu.'qtf gtu.'hēgpugu'cpf 'gz go r v k p u' h q t' e q p u t w e v k p p' c p f' q r g t c v k p q h' v g t o k p c n' c p f' k p v t u c v g' h c e k r k v' p g g f g f' v q' k o r q t v' q t' g z r q t v' p c w t c n i' c u' r w t u w c p v' v' q' U g e v k p u' 5' c p f' 9' q h' v' j g' P c w t c n I' c u' C e v' * 3 7' W U U E 0 E' 9 3 9 h 0'

"

Vj ku'r tqr qugf 'co gpf o gpv'eqo dkpgu'v'j q'r t g x k q w u' g p v' k g u' 3+ 'r g t o k u' c p f' ' h e g p u g u' t g s w k t g f' ' h q t' k p v t u c v g' r k r g k p g u. ' c p f' ' 4+ ' h e g p u g u' c p f' ' g z g o r v k p u' h q t' e q p u t w e v k p' c p f' ' q r g t c v k p' q h' h c e k r k v' p g g f g f' ' v q' k o r q t v' q t' g z r q t v' p c w t c n i' c u' 0' Vj g' c o g p f' o g p v' c n u q' r t q x k f g u' c' r g i c n i' e k c v k p' v' q' v' j g' P c w t c n I' c u' C e v' 0''''''''

"

Fgrctwo gpv'qhJ qo grpf 'Ugewt k' '6'WUUEqcuw'I wctf

"

Cff <'

F g v g t o k p c v k p' q h' C r r t q x c n i' q h' R t k c v g' C k f u' v q' P c x l i c v k p' w p f g t' 5 5' E 0 H 0' 0' R c t w' 8 4' e p f' 8 8 0'

"

F N E F ' r t q r q u g u' v' c f f ' v' j g' W U U E q c u w' I w c t f' ' c w j q t k v' { ' v' j c v' t g s w k t g u' c p { ' q h u j q t g' f g x g n r o g p v' v' q' r t q x k f g' c' r r p. ' c p f' ' k p u c m f g x k e g u. ' v q' g p u w t g' v' j g' p c x k i c v k p c n i' u c h g v' { ' q h' o c t k p g t u' k p' r t q z k o k v' ' v q' v' j g' h c e k r k v' { 0' Vj g' W U E I ' f g v g t o k p c v k p' v' { r k e c m f' ' t g s w k t g u' r g e k l e' r k i j v p i' ' c p f' ' q v j g t' o' g c u w t g u' d g' k p u c n g f' ' c e e q t f k p i' ' v q' v' j g k' i' w k f g r k p g u' 0' Vj k u' h g f g t c n i' c e v k p p' k u' i' k u n g f' ' c u' q p g' q h' v' j g' h g f g t c n i' c w j q t k k g u' k p' v' j g' c e e q o r c p { k p i' ' I g q i t e r j k e' N q e c v k p' ' F g u e t k r v k p' y j k e j' ' e q p v k p u' c p' c p c n i' u k u' q h' v' j g' t g c u q p c d n i' ' h q t g u g g c d r g' g h g e v u' 0''''

"

"

Hgf gtcnCi gpef 'Eqo o gpwu'

Qp'Hgdtwct { '42.'4236.'F N E F ' u g p v' r g w g t u' v' q' v' j g' j g c f u' q h' v' j g' H G T E. ' D Q G O. ' v' j g' W U U' E q c u w' I w c t f. ' G R C. ' c p f' ' v' j g' U w t h e g' V t c p u r q t c v k p p' D q c t f. ' c u' y g n i' c u' v' q' t g r x c p v' h k r f' ' u c h t 0' Vj g' r g w g t u' k p h q t o g f' ' v' j g' c i g p e k g u' q h' v' j g' r t q r q u g f' ' e j c p i g u. ' c p f' ' k p x k g f' ' s w g u k p u. ' e q o o g p w u. ' q t' e q p e g t p u' t g i c t f k p i' ' v' j g' w r f c v g f' ' i k u 0''''

"

Kp'c'rgwgt 'f cvgf 'O ctej '39.'4236.'O t0F cxkf 'Cmpww.'F kt gevqt 'qh'v'j g'GRC'T gi kqp'32' Qhheg'qh'Gequ{ ugo u.'Vtkdcn'cpf 'Rwdike'Chcktu.'t gur qpf gf 'qp'dgj cni'qh' Cf o kpkwtcvqt' I kpc'O eEctv j { . 'eqpewtkpi 'y kj 'F N E F ō'r tqr qugf 'tgo qxcn'qh'r gto ku'hqt'cv'ugc' kpekpgtcv'kqp'qh'ej go kecn'qt'v'zle'y cuguo'0'O t0Cmpww'eqpht o gf 'v'j cv'GRC'f qgu'pqv'j cxg'c' i gpgtcnr' gto k'hqt'cv'ugc' kpekpgtcv'kqp.'cpf 'y qwf 'eqpukf gt'uwej 'cp'cev'kqp'w'p'f'gt'v'j g' tgi wv'kpu'cpf 'r qn'ekgu'qh'Ugev'kqp'324'qh'v'j g'O ctkpg'Rtqv'gev'kqp.'T gugctej 'cpf' ' Ucpewctkgu'Cev'qh'3; 940''''''

"

k'c'ngwt'f cvgf 'O c { '3; . '4236. 'DQGO 'pqvgf 'y cv'egt v'kp'kp'k'k'f wcn'r gto ku'F NEF " r tqr qugu'rk'k'pi 'hqt'eqpukv'gpe { 'tgx'kgy '*rk'ngf 'kp'Kgo 'D+'ctg'ecr wt'gf 'y kj'kp'v'j'g'r'rp'u' v'j'cv'ngu'ggu'r tqx'k'f g'v'q' 'DQGO 'r' t'k'qt'v'q'cwj'qt'k'c'v'k'p'q'h'c'p { 'q'h'uj'qt'g'ce'v'k'k'k'gu'c'p'f " v'j'gt'gh'qt'g'f'q'p'q'v't'gs'v'k't'g'eqpukv'gpe { 'tgx'kgy 'qp'v'j'g'k't'q'y'p'o'g't'k'o'F'NEF 't'g'ur'ge'v'hw'k'f " f'k'uc'i't'g'gu'c'p'f 't'g's'w'gu'u'v'q't'g'x'k'gy 'v'j'g'k'p'f'k'k'f'w'cn'r'g't'o'k'u'k'p'q't'f'g't'v'q'g'p'u'w't'g'h'w'n'eqpukv'gpe { " y'k'j'v'j'g'QEO'RO'" "

Vj'g't'gi'k'p'c'n'le'q'o'o'c'p'f'q'h'v'j'g'W'U'W'E'q'c'u'v'I'w'c't'f'eq'p'v'c'v'g'f'v'j'g'f'g'r'c't'w'o'g'p'v'd' { 'r'j'q'p'g'v'q' " t'g'x'k'gy 'v'j'g'r'w'r'q'u'g'q'h'v'j'g'ng'wt'c'p'f'f'k'ue'w'u'v'y'j'c'v'k'h'c'p' { . 't'g'ur'q'p'ug'v'j'g' { 'o'c' { 'u'w'd'o'k'o'V'j'g' " f'g'r'c't'w'o'g'p'v'eq'p'h'k't'o'g'f'v'j'c'v'v'j'g'r'w'r'q'u'g'q'h'rk'k'p'i'v'j'g'W'U'E'I'cw'j'q't'k'c'v'k'p'y'c'u'v'q'c'f'f't'g'u' " eq'p'eg't'p'u't'g'r'v'g'f'v'q'o'c'k'p'v'c'k'p'i'uch'g'p'c'x'k'c'v'k'p'k'p'v'j'g'x'k'k'p'k'v'q'h'c'p' { 'h'w'w't'g'o'c't'k'p'g' " t'g'p'gy'c'd'ng'g'p'g't'i' { 'h'c'ek'k'k'g'u'k'p'h'g'f'g't'c'n'l'y'c'v'g't'u'o'V'j'g'W'U'E'I'x'g't'd'c'm' { 'c'h'k't'o'g'f'k'u't'q'ng'k'p' " g'p'u'w't'k'p'i'uch'g'p'c'x'k'c'v'k'p'."d'w'f'k'f'p'q'v'u'w'd'o'k'v'c'eq'o'o'g'p'v'ng'wt'v'q'v'j'g'f'g'r'c't'w'o'g'p'v'o'" "

HGTE'f'k'f'p'q'v'eq'o'o'g'p'v'o'*****
"
"

Vj'k'v'c'v'k'p'k'v'c'v'k'p'g'R't'q'i't'c'o'E'j'c'p'i'g'

W'r'f'c'v'k'p'i'v'j'g'r'k'ng'f'h'g'f'g't'c'n'r'g't'o'k'v'c'p'f'h'k'g'p'ug'c'v'k'k'k'g'u'v'j'c'v'F'NEF'y'k'n'i't'g'x'k'gy'h'q't' " eq'p'uk'v'g'p'e { 'y'k'j'v'j'g'QEO'R'f'q'g'u'p'q'v'u'w'd'u'c'p'v'k'm' { 'c'n'g't'c'p' { 'q'h'v'j'g'h'k'x'g'r't'q'i't'c'o'c't'g'c'u' " f'g'v'c'k'ng'f'k'p'37'EHT"; 45<" "

30''W'ug'u'w'd'l'g'ev'v'q'o'c'p'c'i'g'o'g'p'v'*U'w'd'r'c't'v'D+'''

Vj'k'u'c'v'k'p'f'q'g'u'p'q'v'u'w'd'u'c'p'v'k'm' { 'e'j'c'p'i'g'v'j'g'w'ug'u'v'j'c'v'v'j'g'QEO'R'ur'g'e'k'h'g'u'c'u'w'd'l'g'ev'v'q' " o'c'p'c'i'g'o'g'p'v'o'W'r'q'p'c'r'r't'q'x'c'n'k'p'3; 99.'v'j'g'QEO'R'k'p'e'n'w'f'g'f'g'p'g't'i' { 'r't'q'f'w'e'v'k'p'c'u'c'w'ug' " u'w'd'l'g'ev'v'q'o'c'p'c'i'g'o'g'p'v'd' { 'v'j'g'w'c'v'g'a'u'eq'c'u'c'n'r't'q'i't'c'o'0'C'u'v'j'g'w'c'v'g'a'u'f'g'u'k'i'p'c'v'g'f'eq'c'u'c'n' " o'c'p'c'i'g'o'g'p'v'c'i'g'p'e { . 'F'NEF'j'c'u'o'c'p'c'i'g'f'v't'c'f'k'k'q'p'c'n'g'p'g't'i' { 'r't'q'f'w'e'v'k'p'*g'r'g'ev't'e' " v't'c'p'u'o'k'u'k'q'p'k'p'g'u.'i'c'u'r'k'r'g'r'k'p'g'u.'g'v'e'0'd' { 't'g'x'k'gy'k'p'i'h'g'f'g't'c'n'l'h'k'g'p'ug'u'c'p'f'r'g't'o'k'u'h'q't' " eq'p'uk'v'g'p'e { 'y'k'j'v'j'g'w'c'v'g'a'u'g'p'h'q't'eg'c'd'ng'r'q'r'k'k'g'u'o'V'j'g'c'f'f'k'k'p'q'h'DQGO'c'p'f'HGTE' " o'c't'k'p'g't'g'p'gy'c'd'ng'g'p'g't'i' { 'c'w'j'q't'k'c'v'k'p'u't'g'h'g'ew'v'j'g'g'x'q'k'k'p'i'w'c'v'g'q'h'g'p'g't'i' { 'r't'q'f'w'e'v'k'p' " k'p'Q't'g'i'q'p'a'u'v'g't't'k'q't'k'n'l'g'c'c'p'f'v'j'g'h'g'f'g't'c'n'l'y'c'v'g't'u'c'f'l'c'eg'p'v'q'Q't'g'i'q'p'a'u'v'g't't'k'q't'k'n'l'g'c.'c'p'f' " g'p'c'd'ng'u'F'NEF'v'q'eq'p'v'k'p'w'g'v'q't'g'ur'q'p'f'v'q'g'p'g't'i' { 'r't'q'f'w'e'v'k'p'c'v'k'p'u'r't'q'r'q'u'g'f'w'p'f'g't'v'j'g' " e'w't'g'p'v'h'g'f'g't'c'n'l'g'i'w'r'v'q't' { 'h'c'o'g'y'q't'n'o'V'j'k'u'c'v'k'p'c'n'q'f'q'g'u'p'q'v'e'j'c'p'i'g'v'j'g'r'rp'p'k'p'i' " r't'q'eg'u'u'q't'g'p'h'q't'eg'c'd'ng'r'q'r'k'k'g'u'c'r'r'k'c'c'd'ng'v'q'g'p'g't'i' { 'h'c'ek'k'k'g'u'q'ec'v'g'f'k'p'q't'y'j'k'ej' "o'c' { " u'k'i'p'h'k'c'p'v' { 'c'h'g'ev'Q't'g'i'q'p'a'u'eq'c'u'c'n'l'q'p'g'0'c'f'f'k'p'i'DQGO'c'p'f'HGTE'o'c't'k'p'g't'g'p'gy'c'd'ng' " g'p'g't'i' { 'c'w'j'q't'k'c'v'k'p'u'v'q'v'j'g'r'k'u'v'q'h'h'g'f'g't'c'n'l'h'k'g'p'ug'u'c'p'f'r'g't'o'k'u'F'NEF'y'k'n'i't'g'x'k'gy'h'q't' " eq'p'uk'v'g'p'e { 'y'k'j'v'j'g'QEO'R'h'w'v'j'g't'f'g'v'c'k'u'v'j'g'v' { 'r'g'q'h'g'p'g't'i' { 'r't'q'f'w'e'v'k'p'u'w'd'l'g'ev'v'q' " o'c'p'c'i'g'o'g'p'v.'d'w'f'q'g'u'p'q'v'u'w'd'u'c'p'v'k'm' { 'e'j'c'p'i'g'v'j'g'w'ug'u'w'd'l'g'ev'v'q'o'c'p'c'i'g'o'g'p'v'o'*****
"

40''''U'r'g'ek'r'b'c'p'c'i'g'o'g'p'v'c't'g'c'u'*U'w'd'r'c't'v'E+'''

Vj'k'u'c'v'k'p'f'q'g'u'p'q'v'e'j'c'p'i'g'v'j'g'et'k'g't'c'h'q't'f'g'u'k'i'p'c'v'k'p'i'c't'g'c'u'q'h'r'c't'v'k'w'w't'eq'p'eg't'p.'q't' " c't'g'c'u'h'q't'r't'g'ug'x'c'v'k'p'q't't'g'u'q't'c'v'k'p'o'*****
"

50''''D'q'w'p'f'c't'k'g'u'*U'w'd'r'c't'v'F+'''

Vj'k'u'c'v'k'p'f'q'g'u'p'q'v'e'j'c'p'i'g'Q't'g'i'q'p'a'u'k'p'r'p'f'q't'ug'cy'c't'f'eq'c'u'c'n'l'q'p'g'd'q'w'p'f'c't' { . 'p'q't'f'q'g'u' " k'v'ej'c'p'i'g'v'j'g'w'c'v'w'u'q'h'g'z'e'n'w'f'g'f'r'c'p'f'u'o'*****

"
"
"

"

60 "Cwj qt klguc'pf 'hti cpk cvkqp '*Udr ct v'G+'

Vj ku'cevqp'f qgu'pqv'udwv'kcm' { 'ej cpi g'Qtgi qpau'cwj qtkv' "qt'qti cpk cvkqp.'pqt'f qgu'kv'
cngt'Qtgi qpau'cf o kpkw'cvkqp'qh'vj g'QEO R0'K'f qgu'pqv'cf f "qt'ej cpi g'cp { "gphqtegcdrg"
r qnkkgu0'Cu'f luewugf "cdqyg.'vj g'cf f kkgp'qh'DQGO "cpf 'HGTE'o ctkpg'tgpgy cdrg"gpgti { "
cwj qtk cvkqp'u'tghgeu'vj g'gxqmkpi "ucvg'qh'gpgti { 'r tqf wekqp'kp'Qtgi qpau'vgttkqtkcn'ugc"
cpf "vj g'hgf gtcn'y cvgtu'cf lcegpv'v'Qtgi qpau'vgttkqtkcn'ugc."cpf "gpcdrgr'F NEF "v'eqpv'kwg"
v'tgur qpf "v'gpgti { 'r tqf wekqp'cevqp'u'r tqr qugf "w'pf gt'vj g'ewt'gpv'hgf gtcn'tgi w'v'qt { "
htco gy qtn'wukpi "gz k'kpi "gphqtegcdrg'r qnkkgu'cpf "hgf gtcn'eqpukv'gpe { 'tgxkgy 'r tqegf vtgu0'"
"

70 "Eqqt f lpcvqp.'r wdile'lpqxqgo gpv'cpf 'pcvqpcnlpvgt guv '*Udr ct v''H+'

Vj ku'cevqp'f qgu'pqv'ej cpi g'cp { "eqqt f lpcvqp.'r wdile'lpqxqgo gpv.'qt'pcvqpcnlpvgt guv'
r tqxkukpu'qh'vj g'QEO R0'Vj g'eqqt f lpcvqp'qh'ucvg'ci gpekgu.'chhgevgf "mecn'i qxgtpo gpw"
cpf "v'kdgu'y kj 'hgf gtcn'ci gpekgu.'tgrv'gf "v'vj g'hgf gtcn'cwj qtk cvkqp'qh'o ctkpg'tgpgy cdrg"
gpgti { 'f gxgmr o gpv.'ku'hcekkv'gf "vj tqwi j "vj g'DQGO 'Qtgi qp'QEU'O ctkpg'Tgpgy cdrg"
Gpgti { "VcunlHqteg0'Vj g'lpvgti qxgtpo gpv'cn'vcunlHqteg'qr gtcv'gu'w'pf gt'c'ej ctv'gt'v'v'v'g"
kpr w'lv'v'DQGO au'f gekukp/o cnkpi 'r tqeguu'qp'kuwgu'tgrv'gf "v'tgpgy cdrg"gpgti { "
cev'k'k'gu'qp'vj g'QEU'qh'vj g'eqcu'qh'Qtgi qp0'Cwj qtk cvkqp'ht'vj g'vcunlHqteg'ku'f gtxgf "
w'pf gt'65'WUUE0E3559*r +9+."d { 'y j lej "DQGO "o wuv'r tqxkf g'ht'vj g'eqqt f lpcvqp'cpf "
eqpuw'ncv'qp'y kj "vj g'I qxgtpq'qh'cp { "ucvg'qt'vj g'gzgew'k'g'qh'cp { 'mecn'i qxgtpo gpv'vj cv'
o c { "dg"chhgevgf "d { 'c'tgpgy cdrg"gpgti { 'm'cug.'gcugo gpv'qt'tki j v'qh/y c { "qp'vj g'QEU.



Participants: Sara Gultinan, Jennifer Hennessey, Paul Klarin, Stefanie Stavrakas, Tim Stearns

Member Updates:

Washington (Jen Hennessey, Tim Stearns):

Marine Spatial Planning (MSP): The State MSP work is in transition; most projects were wrapped up in June (the end of WA's fiscal year). Projects include an economic analysis that includes tribal economic data, a recreational survey by Point 97 and Surfrider, and NOAA NCCOS marine mammal and seabird abundance models, and analysis of ecologically important areas. The MSP team is currently doing spatial analysis on use data (number of uses and intensity of use). The state Department of Fish and Wildlife is updating fishing maps from logbook data and conversations with fishermen. The maps will be presented to the Advisory Council. All project reports are online, and some spatial data are accessible through the MSP viewer (<http://www.msp.wa.gov/>). The team is thinking about how to advertise the wealth of data and information to cities, counties, etc. Surfrider had meetings with visitor bureaus. A Sea Grant extension agent held meetings with community groups, including economic development councils. Planning commissions are another audience for this information. Coordination with the treaty tribes has been ongoing throughout this whole process.

Oregon (Paul Klarin, Stefanie Stavrakas, Sara Gultinan):

WindFloat Pacific Project: Governor Brown's Offshore Wind Advisory Committee met on September 29 to discuss how to make the WindFloat project a reality, especially with regard to a power purchase agreement. No agencies are on the Committee. Next steps for the Committee are somewhat unclear. See appended article for more information.

BOEM and the cooperating agencies are in receipt of Principle Power's Construction and Operations Plan (COP) for the WindFloat project. BOEM is reviewing the COP for completeness (according to requirements in BOEM's regulations) and sufficiency for environmental assessment. The COP is not complete as submitted because it is lacking geophysical survey information. As of Oct 19, this information had not been received, though Principle Power has completed their survey work. USFWS will review for migratory birds and protected species.

Resolute Marine device testing: Resolute is doing preliminary baseline work offshore Camp Rilea. They have acoustic gear in the water. The company is on track to apply for permits to deploy their wave energy device in spring.

Oregon Territorial Sea Plan (TSP): The TSP amendment is being appealed, and all the appeal documents are in. The basis of the challenge is that the Land Conservation and Development Commission does not have the authority to adopt a rule that is not 100% consistent with the Ocean

Protection Advisory Council's recommendations. The state Department of Justice is formulating its response. A decision on the appeal will likely take 1-1.5 years.

California (Sara Gultinan):

Trident Wind potential proposal: Trident Winds LLC is holding preliminary discussions with agencies and stakeholders on a potential floating wind project offshore Morro Bay. The project would consist of 100 floating turbines ~15 miles offshore. The project would take advantage of an outfall pipe from a retired power plant owned by Dynegy, which could be used for power cables. See appended articles.
y : The City of Morro Bay and Trident Wind have signed a Memorandum of Cooperation for the potential project. See appended article.

Other Items of Interest (Tim Stearns, Jen Hennessey, Sara Gultinan):

The draft Seventh Power Plan is now available for public comment and hearings through December 2015 by the Northwest Power and Conservation Council (<https://www.nwcouncil.org/energy/powerplan/7/home/>). The plan considers marine energy to be in the distant future. But, six coal plants will need to be phased out, and so more interest in marine energy may arise.

Regional Wind Energy Resources (from Tim Stearns, thanks Tim!):

Below are some links to efforts to improve wind technology, permitting, planning and siting in the hope that wind can play a larger energy role.

We could ask some of these entities share their vision and work with resource managers. I believe that we can best meet our energy needs if we ensure there is dialogue between

- Technology developers
- Planning & permitting entities
- Energy managers
- Investors
- Local stake holders

The challenging question is how to choreograph constructive engagement. Waiting until the project stage is way too late, while discussing technologies in their formative stages is too early. We know the world needs energy. We need to provide it as efficiently as we can from generation to end use and move toward well sited local renewable resources.

A. DOE wind vision - <http://energy.gov/eere/renewables/wind>

B. Six Regional Wind centers supported by DOE

H Y g]l K]bX 9bYf[mFY[]cbU FYgci fW 7 YbhYfg]b H Y I "G" UfY.

- Northwest Wind Resource and Action Center - <http://nwwindcenter.org/home>
- [Four Corners Wind Resource Center](#)
- [Midwest Wind Energy Center](#)
- (operated by Windustry)

- [Northeast Wind Resource Center](#)
- [Southeast Wind Energy Resource Center](#)
- (operated by Southeastern Coastal Wind Coalition)
- [Islanded Grid Resource Center](#)

C. Northwest Wind Resource & Action Center
<http://nwwindcenter.org/offshore-wind>

The Northwest Wind Resource & Action Center has work groups led by

- Land-based, Utility-scale Wind (Renewable Northwest)
- Distributed and Community-scale Wind (Northwest SEED)
- Offshore Wind (Oregon Department of Energy)

• **K JbX DYfa JhHcc`_jH'** The toolkit includes information on how jurisdictions can standardize their zoning regulations and permitting processes to ensure safe and cost-effective wind energy development that is appropriate for their communities. There is a toolkit tailored to each state in the northwest, with state-specific wind maps and examples. You can download your state's permit toolkit here (sidebar on the upper right of the page):
<http://nwwindcenter.org/standardization-permitting-and-zoning>

D. Northwest National Marine Renewable Energy Center (NNMREC)
<http://nnmrec.oregonstate.edu/>

Belinda Batten
 541-737-9492
belinda.batten@oregonstate.edu

<http://depts.washington.edu/nnmrec/>

- **8 JfYWfcf** (OSU): Dr. Belinda Batten, (541) 737-9492, Belinda.Batten@oregonstate.edu
- **7 c!8 JfYWfcf** (UW): Dr. Brian Polagye, (206) 543-7544, bpolagye@uw.edu
- **7 c!8 JfYWfcf** (UAF): Dr. Jeremy Kasper, (907) 474-5694, jlkasper@alaska.edu
- **Dfc[fUa FYdfYgYbHjY** (OSU): Brenda Langley, (541) 737-6138, Brenda.Langley@oregonstate.edu

E. **I d Jb H Y 5 Jf È K \ Uh H Y BcfH YUghGHUHy G ci `X Xc lc[YH Yf cb cZg\ cfYk JbX VYZfY JHj Hcc `UH** – Clean Energy Group & Navigant – 2015
<http://www.cleanenergygroup.org/assets/2015/Up-in-the-Air.pdf>

Pacific Regional Ocean Uses Atlas (PROUA): The final PROUA data and report are now available. The data is available for download via NOAA's [Digital Coast](#), for download and viewing via the [Marine Cadastre](#), and the report is available on BOEM's [website](#).

The current National Geographic magazine issue is on climate change and includes some discussion of energy. <http://www.nationalgeographic.com/climate-change/special-issue/>

BOEM Studies Ideas Solicitation (not discussed on the call): BOEM invites your input in identifying potential study ideas for consideration on Alaska, Atlantic, Gulf of Mexico and Pacific OCS areas. BOEM's ESP is particularly interested in study ideas that include hypothesis testing, and the

opportunity to include a citizen science component. Please note that ideas submitted must be relevant to BOEM's information requirements in the areas of biological, oceanographic, social, economic and cultural research. See appended notice for more details. Deadline is Nov 20.

REACT Business (Sara Gultinan):

The co-chairs propose that we change our call frequency from monthly to quarterly. There were no objections to this change by the call participants. **Please contact Sara Gultinan if you have any objections.**

Next Call:

Tuesday January 26, 9am PST



Guiltinan, Sara <sara.guiltinan@boem.gov>

Ocean wind project making waves to get guaranteed funding

Romero, John <john.romero@boem.gov>

Tue, Oct 13, 2015 at 4:18 PM

To: BOEM PAC All Employees <boempacallememployees@boem.gov>

PORTLAND TRIBUNE

Tuesday, 13 October 2015

Ocean wind project making waves to get guaranteed funding

Written by [Hillary Borrud](#), Capital Bureau

A committee appointed by Gov. Kate Brown has begun work to figure out how to pay for what would be the first offshore wind project on the West Coast.

The Seattle-based company Principle Power needs a guaranteed stream of money from Oregon ratepayers to move forward with the pilot project known as WindFloat, which could have up to five wind turbines as tall as the Seattle Space Needle and cover as much as 15 square miles in the deep ocean off Coos Bay.

A bill in the Oregon Legislature this year would have required investor-owned utilities to purchase power from the WindFloat project, but the legislation died amid opposition by utilities, a consumer group and industrial businesses. They argued that electricity from offshore wind costs much more than from onshore wind. The commercial fishing and processing industries also opposed the bill and continue to raise concerns about the project.

Susan Chambers, a board member of the Southern Oregon Ocean Resource Coalition in Coos Bay and deputy director of the Portland-based West Coast Seafood Processors Association, said that during the committee's first meeting on Sept. 29, it sounded as though state officials were determined to find a way to fund the project.

"It doesn't sound like there's room for discussion at this point," Chambers said. "That may change. But at this point, it sounds like we have to find a way to pay for this."

In written testimony on the bill to fund WindFloat earlier this year, the Southern Oregon Ocean Resource Coalition said Principle Power initially worked with the fishing industry to identify a location for the wind project. After the company received federal preliminary approval for a larger footprint, Principle Power moved the project site north within that area.

"The project is now located directly in prime shrimp and rockfish fishing areas utilized by several small businesses in Charleston," the coalition wrote. "This action displaces traditional fishermen." The project could also take over some of the area used by a fishing fleet whose members are based in Newport, Astoria and Seattle.

State Rep. David Gomberg, D-Otis, attended part of the committee meeting at the Oregon Department of Transportation building in Salem.

"As we explore these new opportunities, we need to make sure we're doing what we can to explore existing industries and minimizing potential conflicts there," Gomberg said. "I'm thinking of the fishing fleets."

Gomberg said the committee did not discuss the impact to fishermen while he was at the meeting.

The chairwoman of the governor's committee, Rep. Caddy McKeown, D-Coos Bay, did not respond to a request for comment. Kevin Banister, an executive at Principle Power and member of the committee, also

did not respond to a request for comment.

Sen. Betsy Johnson, D-Scappoose, is a member of the committee and said basic questions remained unanswered at the first meeting.

“If there’s a power purchase agreement, the question still remains: at what cost, to whom?”

Chambers said when House Bill 2216, sponsored by Sen. Arnie Roblan, D-Coos Bay, and Rep. Caddy McKeown, D-Coos Bay, was in the Legislature earlier this year, Chambers heard the tariff to subsidize the WindFloat project might have added as little as 35 cents a month to a residential ratepayer’s monthly bill. The cost would be more of an issue for businesses that use large amounts of power.

One way Principle Power could try to sweeten the deal in Johnson’s district would be to handle part of the assembly for the project in her district, at the Port of Astoria.

Mike Weston, director of business development at the Port of Astoria, said Principle Power approached the port four or five months ago to discuss possibly completing final assembly of the wind turbine structures in Astoria. The structures would be too tall to assemble in Coos Bay, because of the bridge that crosses the bay.

“There’s no guarantee it’s going to happen,” Weston said. “For us, it’s kind of hypothetical at this point. It seems like a great concept, though.”

It is unclear when the committee will hold its next meeting. Although the Governor’s Office initially planned to keep the committee meetings private, the first meeting was packed, with some people even sitting on the floor. Spokesman Chris Pair said Thursday that future meetings will be open to the public.

The governor’s WindFloat advisory committee has the following members:

- Kevin Banister, an executive at Principle Power
- State Rep. Sen. Betsy Johnson
- State Rep. Caddy McKeown, D-Coos Bay
- Scott Bolton, a vice president and lobbyist for PacifiCorp
- Varner Seaman, a lobbyist for Portland General Electric
- Dan James, a vice president at Portland-based power cooperative PNGC Power
- Jeff Bissonette, policy director for the Citizens’ Utility Board
- Hillary Barbour, policy director for the advocacy group Renewable Northwest Project
- Debra Smith, general manager of the Central Lincoln People’s Utility District
- Scott McMullen, chairman of the Oregon Fisherman’s Cable Committee
- John Carr, executive director of the industrial business group Industrial Customers of the Northwest Utilities
- Nick Edwards of Coos Bay, who was appointed to represent the fishing community. Edwards is also a member of the Oregon Dungeness Crab Commission and a board member of the Oregon Wave Energy Trust, according to his LinkedIn profile.

—
[John D. Romero, public affairs officer](#)
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[Bureau of Ocean Energy Management](#)
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Guiltinan, Sara <sara.guiltinan@boem.gov>

Trident Winds eyes California floating offshore project

Romero, John <john.romero@boem.gov>

Tue, Sep 22, 2015 at 11:53 AM

To: BOEM PAC All Employees <boempacallememployees@boem.gov>, "Madsen, Caren W" <Caren.Madsen@boem.gov>, Connie Gillette <Connie.Gillette@boem.gov>, "Robinson, Blossom" <Blossom.Robinson@boem.gov>, Tracey B Moriarty <Tracey.Moriarty@boem.gov>

Recharge Magazine

Tuesday, September 22 2015

Trident Winds eyes California floating offshore project

By Richard A. Kessler

Trident Winds is exploring the idea of installing about 100 turbines on floating platforms in Morro Bay, California - technology that it believes will become commercially available and allow cost-competitive development of the west coast's deepwater wind resource, Eric Markell, one of the company's principals, tells Recharge

Trident, a recently formed early-stage development company, is in initial discussions with the City of Morro Bay and key stakeholders there such as fishing interests and local tribes about a potential project that would be located roughly 15 miles (42km) offshore.

Trident's owners were drawn to Morro Bay the location because of its excellent wind resource, existing infrastructure for interconnection and transmission, and electric load. "We think that particular location brings a lot of those advantages to a project we're considering," says Markell.

He cautions that Trident has not made a final, detailed location determination yet. "We think it's very important to get a number of parties on board before we designate a spot and file a preliminary permit (application) with the Bureau of Ocean Energy Management," he says.

BOEM, an agency of the US Interior Department, oversees commercial wind development in federal waters on the outer continental shelf.

"We have no intention to air drop a project into a community without making this very much a collaborative effort," he adds, noting that anyone proposing a major infrastructure project, especially for power generation, needs to be sensitive to the values of that community.

"Our approach to life is that we want to be open and transparent about what we're envisioning here. In particular, we need to come to a sort of conclusion that works for everyone," he says.

The city owns an outfall pipeline from a nearby retired power plant, which Trident believes could be utilized to run transmission cables from the floating turbines in the bay to a switch yard located on plant property. Dynergy, a Houston-based independent power producer, owns the plant and had been leasing the outfall facility.

Markell says Trident is also in discussions with some "key players" in the state such as California Independent System Operator, which manages the grid, and local utilities about interconnect and transmission. "We're in early days in terms of sorting through the needed infrastructure issues," he notes.

West coast potential

The possibility of floating wind next decade and beyond along the west coast of the US holds enormous growth potential for the nascent offshore sector whose focus has been almost exclusively on shallow Atlantic coastal waters from Massachusetts to North Carolina. That makes it easier to use available ocean floor-mounted technology, whereas the continental shelf drops off rapidly near shore along California, Oregon and Washington State.

“There are some attractive features to floating offshore wind that lend themselves to first-mover advantages. We are in the process of exploring that idea,” says Markell, a retired executive at Puget Sound Energy in Washington State, who has 35 years experience in the power sector.

He and his partners in Trident believe the industry faces an “extremely challenging road” to make offshore projects economically pencil out with ocean floor-mounted foundation technology. This is because the US faces enormous challenges and costs to develop the marine infrastructure and engineering to support construction, servicing and decommissioning such projects at sea.

“It makes an already capital intensive industry even more capital intensive,” Markell contends. Floating platforms, by contrast, are manufactured and assembled onshore and towed out and anchored to a pre-existing grid connection system laid on the ocean floor.

“The entire process of production, assembly, transport and also servicing is really quite different and we think a good deal more cost-efficient than floor-mounted,” he says.

By the time Trident obtains approvals and all other “intangible assets” needed to ultimately carry through an offshore project at Morro Bay or elsewhere along the west coast, Markell expects that floating platform technology will become commercially available.

California

He and his partners also believe that the US industry and state electric industry regulators need to take a hard look at ownership and finance models for offshore wind, an area that holds promise for cost-reduction. Offshore wind involved long-dated issues and complex projects that lend themselves to ownership by regulated utilities, Markell believes.

Perhaps California, which views itself as ahead of the nation on renewable energy policy implementation, will also take the lead in modifying their regulatory models about project ownership and financing.

“California is a wonderful place in terms of policy and business model experimentation, trial and error. It’s really a laboratory for what the future is going to look like in the power industry,” he says.

Until now, there has been little talk about possible commercial wind projects off the coast of California, where elected officials led by Governor Jerry Brown and power industry regulators have favored development of utility-scale solar, onshore wind and to a lesser extent, geothermal.

Later this month, Brown is expected to sign a bill that would increase the state’s renewable mandate to 50% by the end of 2030 from 33% by 31 December 2020. That move is seen by environmental activists as a step toward California obtaining 80% of its power from carbon-free sources by 2050.

“One will need an awful lot of incremental renewable energy to serve the state and a good deal of that will come from land-based solar,” says Markell. “But we think there is a niche opportunity for floating offshore wind to be part of that incremental renewable future. That is the opportunity we are pursuing.”

A niche may not sound like much, but California is the second biggest state electricity market after Texas and its \$2.2trn economy is the seventh largest in the world. Economic growth is again outpacing the national average, with state officials confident it will continue to do so in the years ahead. This could open opportunities for gigawatts of offshore wind capacity.

Large solar and onshore wind projects in California are not problem-free. Conservationists are increasingly concerned about the impacts of additional solar projects on desert flora and fauna, while much of the good wind resource has been developed outside more environmentally sensitive areas.

Trident's principals live in Washington State and Colorado.

—

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Guiltinan, Sara <sara.guiltinan@boem.gov>

How a wind-energy project proposed off Morro Bay's coast would work

Romero, John <john.romero@boem.gov>

Thu, Sep 24, 2015 at 11:35 AM

To: BOEM PAC All Employees <boempacallemployees@boem.gov>

SAN LUIS OBISPO TRIBUNE September 23, 2015 Updated 16 hours ago

How a wind-energy project proposed off Morro Bay's coast would work

Wind farms in waters off the California coast could get their start in Morro Bay if one energy company's vision for 100 floating turbines 15 miles offshore comes to fruition



Floating offshore wind turbines have been in development since the mid-2000s. This turbine was installed in 2009 in Norway.
PHOTO COURTESY OF TRIDENT WINDS

Correction: An earlier version of this story should have said the wind farm under construction on the East Coast is off the coast of Rhode Island, not Cape Cod.

By Stephanie Finucane

In a generation or two, offshore wind farms could be as common along the California coast as offshore oil rigs are today. And Morro Bay could be the community where the offshore wind industry gets its start in the Golden State.

Trident Winds LLC has approached the city of Morro Bay with [a proposal to install about 100 floating turbines 15 miles offshore](#). It's a 1,000-megawatt project that would produce enough energy to power 150,000 households. The turbines would rise 360 to 400 feet above sea level, would cover about 63 square miles and would be spaced about half-a-mile apart.

The company is negotiating with the city for use of the outfall line at the northeast side of Morro Rock. A transmission cable would run from the wind farm through the pipeline and on to the Morro Bay Power Plant switch yard, which is connected to the state power grid.

Morro Bay was chosen both for its constant offshore winds and because the existing infrastructure minimizes the onshore work that would be required.

"We would literally have no disturbance on the beach at all," said Alla Weinstein, a co-founder of Trident Energy.

She was involved with a similar pilot project approved in Coos Bay, Ore. That's the first project on the West Coast, though there are others planned on the East Coast, and one — a 30-megawatt, five-turbine project — is under construction off Rhode Island.

While the United States is just starting to embrace the technology, offshore wind farms already are powering homes and businesses in Europe, where there are an estimated 160 offshore farms either in operation, under construction or in the planning stage.

Those differ from the wind farms planned for the West Coast, though.

In most cases, wind turbines (what we often refer to as windmills) are fixed to the ocean floor in Europe, as well as on the East Coast of the United States.

On the West Coast, the ocean is too deep for that. The turbines will float on the surface of the water, where they'll bob up and down with the waves, much as an anchored ship does.

None of this will happen quickly, though, at least not in California.

It took 2 1/2 years for the Coos Bay project to get through the permitting process, Weinstein said. She estimates it could take as long as five years to make it through California's permitting process, since there are state regulatory agencies involved, including the [California Coastal Commission](#) and the [State Lands Commission](#).

Trident has been laying the ground work. In addition to meeting with the city of Morro Bay, it's been working with two groups that have a big stake in the issue: commercial fishermen and the [Northern Chumash Tribal Council](#), which is seeking marine sanctuary status for the offshore area. It's trying to meet with [Dynegy](#), which still owns the shuttered Morro Bay Power Plant.

Trident also plans to sponsor a public meeting to introduce the project, possibly in late October or early November.

The applicants stress that the wind farms are key to reducing reliance on fossil fuels.

"It's clean energy and more consistent than solar," Weinstein said. "Wind is available 24 hours per day."

Andrew Christie, executive director of [the local chapter of the Sierra Club](#), was in agreement about the benefits of wind farms: "We're all for them. It's a great component of getting off fossil fuels."

But as with all projects, there is a caveat: "It's all about location and environmental sensitivity," Christie said.

Bird and bat kill has been one of the big concerns about both onshore and offshore wind farms.

A peer-reviewed study issued last summer estimated turbines kill as many as 368,000 birds annually in North America, [according to an article in USA Today](#), though the newspaper also noted that cats kill between 1.4

billion and 3.7 billion birds per year.

But it isn't just the inadvertent loss-taking of birds that's an issue. According to [BirdLife International](#), offshore wind farms have caused migrating birds to change their routes. That can mean having to travel greater distances, which can affect the survival rates of hatchlings.

In response, there have been increasing calls for turbines designed to deter birds, as well as for locating wind farms outside of bird migration zones.

Weinstein said the turbines planned for Morro Bay will be safer for birds than older-model turbines. For one thing, the blades rotate more slowly in newer models, she said.

Visual impact has been another concern, but at 15 miles or more offshore, the turbines off the Morro Bay coastline won't be visible from the beach.

Cost is another consideration: Wind power is often much more expensive than other types of energy. That's been a sticking point with some potential customers.

"It's nuts to spend all this money on power at three or more times the going cost," was [a comment that a Boston Globe reader offered](#) in response to news that the \$2.6 billion Cape Wind project off the coast of Massachusetts had stalled.

Weinstein declined to give a cost estimate for the Morro Bay project, though she said it's quite different from the Cape Wind project, so the two should not be compared.

She also pointed out that Morro Bay's project is so many years into the future, it's "basically impossible to answer the question today."

As proponents of wind power point out, the objective isn't to produce power as cheaply as possible — it's to reduce reliance on fossil fuels.

"Cape Wind may not be cost-effective in the short term," was the comment from another Boston Globe reader. "But, it is essential that Cape Wind and other projects in New England like it move forward so that New England can have a reliable and sustainable future in clean energy and once again be the guiding light for the rest of the nation."

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Morro Bay enters agreement with Trident Winds

Romero, John <john.romero@boem.gov>

Wed, Nov 4, 2015 at 12:06 PM

To: BOEM PAC All Employees <boempacallememployees@boem.gov>

NEW TIMES (San Luis Obispo, CA)

10/14/15

Morro Bay enters agreement with Trident Winds

By JONO KINKADE

The city of Morro Bay has agreed to cooperate with a company that has lofty plans to build a large wind energy plant 15 miles off the coast of Morro Bay.

The agreement, called a memorandum of cooperation (MOC), is non-binding and largely symbolic, but is a sign of good faith between the two parties as Trident Winds LLC continues to pursue its plans for the project, said Morro Bay City Manager Dave Buckingham.

"In a way, it's simply a public flag that says the city is intrigued by this, and is talking to Trident and to all involved parties as Trident pursues their private activities," Buckingham told New Times.

The City Council voted 4-0 on Oct. 13 to approve the memorandum. The city will be one of several government agencies that may be asked to permit parts of the project in the future.

The project, which is in the early planning stages, would generate one gigawatt of electricity using approximately 100 wind turbines. The turbines, which Buckingham said would be anywhere from 15 to 50 miles off the coast, would be floating on top of the ocean, with large anchors dropped onto the ocean floor.

The project could possibly involve utilizing part of the now-inactive Morro Bay Power Plant (MBPP) to transfer the electricity it generates to transmission lines owned by Pacific Gas and Electric. The MBPP, which city documents say has been rendered inoperable since January 2013, has been a bit of an albatross for the city as officials consider several options for the demolition or conversion of the existing facility.

According to the agreement between Morro Bay and Trident Winds, the two parties will work cooperatively to consider reuse options of the existing plant, owned by Dynegy, and through the extensive permitting process, which will include requirements from several state and federal agencies. Buckingham estimated the process would take approximately five to six years.

The MEMORANDUM OF COOPERATION BY AND BETWEEN THE CITY OF MORRO BAY CALIFORNIA (the "City") AND TRIDENT WINDS LLC ("Trident"), can be viewed at: <http://morro-bay.ca.us/DocumentCenter/View/8884>

—

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BOEM invites ideas for Environmental Studies, Fiscal Year 2017

10-26-2015

The Bureau of Ocean Energy Management (BOEM) is responsible for ensuring that the effects on the natural and human environment are taken into consideration during the leasing and development of oil, natural gas, renewable energy and marine mineral resources on the Outer Continental Shelf (OCS).



To help inform management decisions affecting the OCS, BOEM develops, oversees and funds the collection of environmental information as directed by the Outer Continental Shelf Lands Act through its Environmental Studies Program (ESP). The ESP focuses on applied science, including baseline information about the environment and the effects from activities that result from the leasing and development processes under our authority. The goals of the ESP are to establish the information needed to assess, predict, monitor and manage environmental impacts on marine biota and the human, marine and coastal environments. BOEM is beginning to formulate its FY2017 Environmental Studies Development Plan covering all BOEM energy and minerals activities.

BOEM invites your input in identifying potential study ideas for consideration on Alaska, Atlantic, Gulf of Mexico and Pacific OCS areas. BOEM's ESP is particularly interested in study ideas that include hypothesis testing, and the opportunity to include a citizen-science component. Please note that ideas submitted must be relevant to BOEM's information requirements in the areas of biological, oceanographic, social, economic and cultural research.

Please provide your suggestions in short paragraph form for your geographic or program area of interest by emailing it to the contact identified below by November 20, 2015. Be sure to include why this is an important area of research for BOEM to consider. This will ensure you are providing the relevant information we need to consider your ideas. All submitted ideas become property of the government. While suggestions will be reviewed on a case-by-case basis, there is no guarantee that all ideas will be accepted. In some cases, ideas might be combined with other suggestions. Acceptance of a study idea does not imply that the submitter will receive funding. You may visit the Environmental Studies Program website for a listing of ongoing and completed studies and to view previous study plans. We appreciate your participation in this process and look forward to your suggestions.

Dr. Rodney Cluck
 Department of the Interior
 Bureau of Ocean Energy Management
 Chief, Division of Environmental Sciences
 Environmental Studies Program

Region/Topic	Contact
Alaska Studies	Dr. Dee Williams, Alaska Studies Chief (Dee.Williams@BOEM.gov) (907) 334-5283
Gulf of Mexico Studies and Atlantic Oil and Gas Studies	Dr. Pat Roscigno, Gulf of Mexico Studies Chief (Pasquale.Roscigno@BOEM.gov) (504) 736-2752
Pacific Oil and Gas Studies or Pacific Renewable Energy Studies	Dr. Ann Bull, Pacific Studies Chief (Ann.Bull@BOEM.gov) (805) 384-6385
Atlantic Renewable Energy Studies	Dr. Mary Boatman Renewable Energy Studies Chief (Mary.Boatman@BOEM.gov) (703) 787-1662
Atlantic Marine Minerals Studies or Gulf of Mexico Marine Minerals Studies	Dr. Jeffrey Reidenauer MMP Branch Chief (Jeffrey.Reidenauer@BOEM.gov) (703) 787-1851

For More Information:
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STATE OF OREGON - DLCD

Analysis of Shoreline Armoring & Erosion Policies

Along the Oregon Coast

Meg Gardner

2013-2015 NOAA Coastal Management Fellow

4/30/2015

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Executive Summary

The Oregon coast is a beautiful and dynamic environment that draws people to the area to live, recreate, work, and enjoy. However, the high energy wave and wind environment of the coast can create a challenging setting for development and human life. Strong winter storms and erosion have led to loss of beach and property in many areas. Various adaptation strategies have been employed or discussed for how to both protect property and the public beach, from shoreline armoring to managed retreat. These strategies can be controversial depending on the stakeholder group, but are important to explore collaboratively. The Oregon Coastal Management Program and the Oregon Parks and Recreation Department, in consultation with local and state partners, have created this document in order to analyze and integrate current public policy regarding coastal erosion and shoreline armoring with the latest relevant geospatial and natural science information (including predicted impacts of climate change), in order to understand the most vulnerable coastal areas.

The Oregon coast is currently about 5% armored (22.5 miles). The majority of that armoring (92%) occurs in Clatsop, Tillamook, and Lincoln Counties. Tillamook and Lincoln Counties have the highest vulnerability to coastal erosion and highest potential for increased shoreline armoring, while Clatsop County has moderate vulnerability and the southern coastal counties of Lane, Douglas, Coos, and Curry have the lowest vulnerability to coastal erosion and future shoreline armoring. These differences are due to coastal population and development distribution, types of development, location of publically owned lands, and coastal processes that shape the coastline in different areas. The spatial analysis section of this report further breaks down these assessments by City and County.

Policy ideas are also explored in this report from changing statewide policy related to beachfront protective structure permitting and eligibility requirements, to adopting new local land-use policies to regulate development in coastal hazard zones. The ideas presented here are not exhaustive. In many ways, the state policies are already effective at regulating shoreline armoring equitably and broadly along the coast. On the other hand, local government policy changes or additions may be a more effective way to try to address some of the current policy challenges related to shoreline armoring and coastal erosion risks. Local efforts can be tailored to each jurisdiction and its unique geography and social context, and local efforts can be more restrictive than statewide policies. Several local policy ideas are explored in the Policy Ideas section of this report.

It is hoped that this analysis will help to better inform adaptation discussions and strategies to assist local jurisdictions, with the goal of increasing resiliency of communities to coastal erosion hazards. In addition to this report, new online spatial information about shoreline armoring locations and future eligibility is available through the Oregon Coastal Atlas. This information can be viewed online (www.coastalatlasc.net/oceanshores/) or downloaded as a data service. This data can be used as a decision-support tool for local planners, beachfront homeowners, and coastal managers.

Background

The Oregon coast is a beautiful and dynamic environment that draws people to the area to live, recreate, work, and enjoy. However, the high energy wave and wind environment of the coast can create a challenging setting for development and human life. Strong winter storms and erosion have led to loss of beach and property in many areas.

Various adaptation strategies have been employed or discussed for how to both protect property and the public beach, from shoreline armoring to managed retreat. These strategies can be controversial depending on the stakeholder group, but are important to explore collaboratively. The Oregon Coastal Management Program and the Oregon Parks and Recreation Department, in consultation with local and state partners, have created this document in order to analyze and integrate current public policy regarding coastal erosion and shoreline armoring with the latest relevant geospatial and natural science information (including predicted impacts of climate change), in order to understand the most vulnerable coastal areas. Additionally, it is hoped that this analysis will help to better inform adaptation discussions and strategies to assist local jurisdictions, with the goal of increasing resiliency of communities to coastal erosion hazards.

In addition to this report, new online spatial information about shoreline armoring locations and future eligibility is available through the Oregon Coastal Atlas. This information can be viewed online (www.coastalatlases.net/oceanshores/) or downloaded as a data service. It is hoped that the data can be used as a decision-support tool for local planners, beachfront homeowners, and coastal managers (see *Results* section for coast wide armoring and eligibility statistics). For more details on the methods regarding the creation of these datasets, please refer to the appropriate methods documentation.

THE ISSUE

Coastal erosion and inundation (flooding) are two impacts experienced frequently and widely at the Oregon coast. Local variations and uneven distribution of development on the coast result in more damaging impacts to some areas over others. The northern and central coasts are more highly developed and experience higher impacts to development from coastal erosion. For example, in Tillamook County, the communities of Neskowin, Tierra Del Mar, Rockaway Beach, Cape Meares, and Pacific City experience high levels of erosion and/or ocean flooding. Many of these areas are low-lying, while others are built on highly-erodible dunes or bluffs. Dune-backed shorelines are some of the most highly erodible areas, but also the most attractive places to live. Much of the development in these areas occurred in the 1960s and 1970s, before people knew very much about coastal processes. Gleneden Beach, Salishan Spit, and Bayshore are similarly vulnerable communities in Lincoln County. The southern coast of Oregon, however, remains mostly undeveloped along the oceanfront with large tracts of publically-owned lands. A notable exception is the community of Nesika Beach in Curry County, which is experiencing high levels of erosion to bluff-dwelling homes.

There are several causes of erosion hazards occurring along the coast, including: 1) increases in total water levels (TWL); 2) changes to sand movement in littoral cells due to El Niño; 3) rip embayments; and 4) structural effects of armoring.

- 1) Total water level (combination of tides, surge, wave set-up, wave run-up, and sea level rise) is a way to measure wave damage and flood potential. In some areas, particularly in Neskowin, the width of the beach has decreased substantially; so during high TWL, wave energy has less area to dissipate before coming in contact with a structure, dune, or bluff toe, which can cause significant erosion to those areas.
- 2) During an El Niño event, sand can move dramatically in a littoral cell, taking sand away from one area and depositing it in another area. Typically, the sand will rotate back and the beach will recover; however, this did not happen after that last El Niño event in Neskowin, leaving the beach devoid of sand and vulnerable to high water levels. Conversely, Pacific City, on the north end of the littoral cell, has become sand inundated.
- 3) Rip embayments are localized areas of erosion where sand scour occurs and larger waves can reach shore. They typically form during high wave energy events where sand levels are lower. In some areas of beach, rip embayments are recurring, causing exacerbated erosion in those areas, like in Neskowin and Gleneden Beach.
- 4) Finally, structures built to armor the coastline can cause localized erosion damage. They can fail and/or unravel over time, especially when the structure's toe is not sitting on bedrock or when a structure is overtopped and subsequently becomes saturated from behind/beneath, causing mass failure. The angle of the structure is also usually steeper than a natural beach profile, increasing wave run-up.

CLIMATE CHANGE

There are many ways in which climate change will impact the Pacific Northwest, from increased wildfire hazards to more frequent intense rainstorms. For the Oregon coast, sea level rise (SLR) will likely be one of the most significant effects of climate change that will further exacerbate erosion and other coastal hazards. Additionally, increasing extreme storms and wave heights can be another factor impacting the coast.

Factors influencing SLR in the Pacific Northwest include melting of Alaskan and Greenland ice, tectonic processes, and ocean and atmospheric circulation. According to the National Research Council, the Oregon coast is currently experiencing slight vertical uplift (1.5-3mm per year) or sea level fall, with the southern coast of Oregon experiencing greater tectonic uplift than other areas of the coast (2012). However, the trend will likely reverse around 2030 because the rate of sea level rise will overtake the rate of tectonic uplift. Moreover, an earthquake along the Cascadia subduction zone will suddenly raise local sea level 1-2 meters. Sea levels have already risen in the region about 2.3mm per year over the last 50 years (OPRD, 2010). Current projections suggest sea level along the Northwest coast (Oregon and Washington) will rise 9-143cm by 2100 with large local variations (Dalton et al., 2013). Some of those

variations are due to ENSO (El Niño Southern Oscillation) and PDO (Pacific Decadal Oscillation), which affects sea levels on seasonal or decadal timescales. While the rate of sea level rise is relatively low on the west coast over the next 20-40 years, impacts from high water events and winter storms (which is when most coastal damage occurs) during ENSO, PDO, or even high astronomical tides, will be exacerbated. Additionally, the rate of sea level rise will continue to exponentially increase over time, becoming a more significant challenge. Lastly, some climate models predict that large waves are getting bigger and winds are getting stronger, which will also contribute to increased coastal erosion in Oregon (NRC, 2012).

On the Oregon coast, sea level rise means waves will break closer to the coastline and reach the cliff or bluff bases more frequently, increasing the rate of erosion and cliff retreat. Dunes are also predicted to retreat under rising sea levels and larger waves, threatening their natural buffering function as well as the development that has been constructed on dunes or barrier spits. With higher sea levels, especially in areas with hardened shorelines, beach accessibility is likely to decline as the width of the beach decreases. This is problematic not only for people who wish to access the beach, but also for marine animals who utilize the beach, such as seals for haul-out sites, and other tidally-dependent organisms. Hardened shorelines can also prevent habitat (like dunes or wetlands) from migrating upland with sea level rise. With increased levels of erosion, the threat to oceanfront development will increase, including to private property and public facilities and infrastructure. Under current law, public infrastructure (highways, public utilities, etc.) cannot be armored (see *Current Policies* section).

CURRENT ADAPTATION STRATEGIES

Shoreline armoring is the practice of using physical structures to mitigate the effects of coastal erosion along shorelines. The most common beachfront protective structure is riprap – large rocks placed to absorb the energy from waves. Other protective structures include retaining walls, seawalls and revetments. The number of permit requests to the Oregon parks and Recreation Department (see “Current Policies” section for more information) will likely increase, especially on the north and central coasts, given impacts of climate change and increased erosion.



Example of riprap on Oregon coast.

Shoreline armoring can adversely affect ocean beaches and neighboring properties. They can create erosion and other problems for adjacent areas due to local scour caused by wave reflection; they can alter sand movement and water currents and reduce public access to the beach; and they can create unpleasant visual and aesthetic impacts. Hardening the shoreline can also mean large stretches of the beach may be narrowed or even inaccessible during certain times of the day or year because the structures encroach onto the public beach. Additionally, armoring reduces the ability of beaches and dunes to adapt to new conditions by holding the shoreline in place rather than allowing the normal dynamic process to occur. Coastal development and the occurrence of several strong El Nino events has

led to increased coastal storm damage over the past several decades, despite protection from shoreline protective structures. Additionally, as sea levels and wave heights increase, overtopping of structures will become more frequent. Because seawalls and revetments cannot migrate landward as sea levels increase, they will eventually be inundated as well.

Pros of Riprap:

- Effective at dissipating wave energy
- Provide and maintain stability through weight and interlocking of individual stones
- Most cost effective measure for mitigating erosion hazard problems (since there is an abundance of basalt rock in the Pacific Northwest)
- Offer immediate protection of at-risk private property; help to protect communities and infrastructure behind the immediate oceanfront lots

Cons of Riprap:

- Increase wave energy near structure, which can accelerate erosion to neighboring properties and create rip embayments
- Can lead to domino effect: riprap leads to more riprap of adjacent properties due to localized erosion
- Alter natural character of the beach and can be aesthetically displeasing
- Disrupt natural shoreline erosion processes, locking up material from littoral cells use
- Wave overtopping is already occurring; property is not fully protected
- Designs are not well studied
 - Best practices are based on contractor knowledge and science is not well integrated into structure design
 - Designs may become larger in the future, resulting in further loss of the public beach
- Require constant maintenance over time because of their continual wave exposure; maintenance costs can get expensive and may be prohibitive in the future
- Can cause beach to steepen and lose sand, impacting beach access
- Disrupt natural ecosystems; grain size can increase after a structure is built

ALTERNATIVES TO SHORELINE ARMORING

There are some non-structural options available to help mitigate erosion, but their feasibility varies depending on the area, the costs of implementing such alternative options, and other factors. For example, the current definition of riprap in state law is written in such a way that may preclude some alternatives (see *Policy Discussion* for more details).



**Cobble Berm (dynamic revetment) at
Cape Lookout State Park**



Sand burritos with willow planting in Cannon Beach.
Left: During construction in 2002. Right: Two years after planting (in 2004).

When armoring is necessary, a dynamic revetment might be a feasible alternative that will slow erosion processes and work with the forces of nature rather than against them. A dynamic revetment involves placing cobble or gravel along the beach in front of the property to be protected and may be considered more aesthetically pleasing than traditional engineering solutions (if it matches the natural character of the original beach setting). An example of a cobble revetment is located at Cape Lookout State Park, where a septic field was at risk of severe erosion. This softer solution does reduce wave energy and prevent increased erosion; however, it does require high maintenance to keep the volume and placement of the cobbles at an effective level.

Vegetation and natural landscaping features have also been shown to help slow water or deflect wave energy. Coastal mudflats and marshes, eelgrass, plants and trees, wide beaches, dunes, and other topographic features have been shown in various instances to protect inland areas from inundation and wave damage. However, the effects of these features have not been well documented on the west coast. In particular, the Oregon coast is extremely vulnerable to high wind and waves, making alternative and “soft” solutions more difficult to develop and maintain. In some instances, fill and vegetation plantings have helped to stabilize shorelines in areas that have slightly lower wave energy environments. For example, in Cannon Beach, sand “burritos” (textile bags filled with sand and placed on the beach) together with a willow planting was used to stabilize a low bluff, rather than a traditional riprap, and it has been in place since 2002. Placement of natural materials such as woody debris in front of vulnerable dune or bluff toes can also be effective at mitigating erosion and mimicking the natural character of the beach.

Additional alternative options to riprap may include: beach nourishment; nearshore breakwaters; seawalls design with a return; structural adaptations (e.g. elevating houses on pilings); and managed retreat (e.g. moving houses away from coastline as erosion continues). Many of these alternatives are costly and/or unpopular, which is why they are generally not pursued. For example, offshore breakwaters may help the community of Neskowin by tripping waves in the surf zone; however this solution would cost tens of millions of dollars to build. Likewise, beach nourishment may be a solution in certain areas, but would require a suitable sand source and considerable funding to carry out and maintain over time. The small coastal communities of Oregon do not have the same level of demand

and tourism dollars invested as many coastal communities on the east coast to carry out beach nourishment projects. Land-use considerations and policies (like greater development setbacks) may be a more viable option for Oregon's small coastal communities to address increasing erosion hazards.

Regardless of the type of option, alternatives to traditional riprap should consider adjacent habitats, shoreline energy, and wind and wave dynamics; there is no one-size-fits-all solution. More information about some of these alternatives and how they were considered for the community of Neskowin (in Tillamook County) can be found in the *Neskowin Shoreline Assessment* by ESA PWA. Some of these ideas are also further discussed in the *Policy Discussion* section of this report.

HUMAN ELEMENT

Oregon's coastal cities and counties vary in their capacity to deal with coastal hazards, as well as in their potential for increases in population and development. While the greatest increases in populations are expected to occur in Lane and Douglas Counties by 2050 (according to Oregon's Office of Economic Analysis), those increases will likely occur in the valley and not along the coast (as their coastlines are small and mostly publically-owned). Lincoln, Clatsop, and Tillamook Counties will also experience increases in populations by 2050 and those increases are more likely to happen along the coastal strip. It will be important for these jurisdictions to prepare for this increase by planning for resiliency to all coastal hazards, including erosion.

There may be various options for dealing with coastal erosion hazards, but there are just as many sentiments about what methods should be considered or carried out, as well as political realities and resource constraints, all of which are important to consider in coastal resource management and oceanfront development. The 1967 Beach Bill, signed by Governor Tom McCall, granted the public recreational access to Oregon's beaches, up to the vegetation line. This public resource is strongly treasured by Oregonians. Many oppose shoreline armoring because it does encroach on the public beach to protect private property, while others (namely oceanfront homeowners) wish to be able to do whatever it takes to save their valuable homes and private property investments. This is not a new struggle, nor is it unique to Oregon's coast. Many coastal states, particularly those severely damaged by hurricanes (e.g. Louisiana, Florida, New Jersey), are deciding whether managing the coastline through engineering and natural solutions is more feasible and cost-effective than moving communities away from the shorelines.

While the Oregon coast is much less developed than many other coastal states in the U.S., it does have an extremely dynamic and challenging coastal climate with significant existing development at risk from various coastal hazards. There is good information available about coastal erosion and shoreline armoring, but there are a lack of details addressing cumulative impacts of armoring structures, especially in regards to each littoral cell and its unique geography, development, and coastal environment. There is need for additional research and monitoring of shoreline armoring along the Oregon coast, in order to improve future decision-making regarding this issue.

Finding balance between the protection of private property and the protection of the public beach is a constant challenge that necessitates transparency, sound information, and extensive stakeholder input. Decision makers want to ensure they have the best available information to help them make decisions, as well as public input and support for those decisions. This analysis is meant to serve as a tool for coastal resource managers, land-use planners, and local officials by providing information regarding the challenges presented by coastal erosion, as well as potential options for mitigating its effects along the Oregon coast. The sections that follow provide information about the current policies regarding shoreline armoring, as well as an analysis of the current state of armoring and possible policy changes or additions for consideration, with the ultimate goal of increasing resiliency of communities to coastal erosion hazards.



Emergency riprap being installed during a winter storm event in Neskowin (Tillamook County, OR)

Current Policies

When much of the coast was initially developed, there was a lack of understanding of the coastal hazards and processes at work (i.e. in the 1950's through 1970's). Therefore, development was built on dunes, barrier spits, active landslide areas, and other areas at risk or actively exposed to coastal hazards. This situation in particular creates a tug-of-war between protecting private property and the rights of property owners with protecting the public beach and the beach environment. As a result of these issues and related conflicts, Oregon developed a set of state land-use policies which were put in place in 1977 and further clarified in 1985 to address this struggle.

In addition, under the Beach Bill enacted in 1967, the public has free and uninterrupted use of the beaches along Oregon's entire coastline. The Beach Bill also directs that the ocean shore be administered as a state recreation area. The Oregon Parks and Recreation Department (OPRD) is charged with the protection and preservation of the recreation, scenic, and natural resource values found on Oregon's ocean shore. Through its ocean shore rules, OPRD regulates various uses and activities on the ocean shore, as well as administers a permit program for ocean shore alterations. Ocean shore alterations include the construction of beachfront protective structures, beach access ways, sand alterations, the routing of pipelines and cables beneath the ocean shore, and natural product removal. Both the state land-use policies and the beach alteration rules work together to regulate shoreline armoring on the Oregon coast.

GOAL 18 BEACHFRONT PROTECTIVE STRUCTURE ELIGIBILITY

The State of Oregon has a set of state laws that mandate and regulate land-use, administered by local governments through their local land-use programs. The foundation of that program is a set of 19 Statewide Planning Goals. Oregon Statewide Planning Goal 18, Beaches and Dunes (OAR 660-015-0010), outlines where development and other uses can occur in beach and dunes areas, but also describes limits for the issuance of permits for beachfront protective structures (BPS). Implementation Requirement #5 stipulates that "development" must have existed on a property as of January 1, 1977 to be eligible for a BPS permit. Development is defined as:

- **Houses, commercial and industrial buildings;**
- **Vacant subdivision lots which are physically improved through construction of streets and provision of utilities to the lot; or**
- **Areas where an exception to Goal 18 Implementation Requirement #2 has been approved.**

Statewide Planning Goal 18 also requires that local comprehensive plans identify areas where qualifying development existed as of January 1, 1977 for the purpose of determining eligibility for BPS. However, because this requirement was added after most jurisdictions had already approved their Comprehensive Plans, most coastal jurisdictions do not have an official inventory of coastal parcels that are designated eligible and not eligible for BPS. A case-by-case method of making a determination is currently the most

common practice. However, as of 2014, a coast wide inventory of eligibility determinations now exists as a resource for all coastal jurisdictions to use. It is centrally housed with the Oregon Coastal Management Program, but can also be distributed to other jurisdictions as needed (many jurisdictions already have and are using this newly completed dataset, with some moving towards adoption of the inventory maps into their Comprehensive Plans to be in compliance with Goal 18 requirements).

OPRD BPS PERMITTING

The State also has a set of requirements under OAR (Oregon Administrative Rule) 736 Division 20, specifying the conditions in which a BPS can be permitted. These are implemented by the Oregon Parks and Recreation Department (OPRD). Permits are required for any ocean shore alteration, which includes BPS, because they often encroach on the public beach or are within the area of OPRD's permit authority (which is the area between extreme low water and the vegetation line). Some of the requirements for a BPS application include an analysis of hazard avoidance alternatives (e.g. moving a house back) and a geologic report on potential impacts of the proposed project and non-structural alternatives. In addition, the rule outlines standards (general, scenic, recreation, safety, natural and cultural) by which the permit should be evaluated. In the few cases where new BPS are approved, they must be designed and built to minimize adverse environmental effects.

A geospatial inventory was completed as of the end of 2014 to map the locations of all known BPS and their corresponding permit and repair information along Oregon's outer coast. This inventory and the eligibility inventory have been analyzed to start to address some frequently asked coastal management questions regarding shoreline armoring in Oregon, such as the current length of armoring and the future potential of armoring (see *Spatial Analysis Results* section). Shoreline armoring within estuaries are under the jurisdiction of the Department of State Lands and are not a part of this geospatial inventory.

LOCAL GOVERNMENT REGULATIONS

In addition to statewide policies that address shoreline armoring, local governments may (and some have) adopt land-use regulations (i.e. overlay zones, setback requirements, etc.) to reduce risk and the need for future BPS through such tactics as better geologic report standards (safest site), reduction in dwelling density in hazard areas, and moveable foundations for development in coastal hazard zones.

Both state and local policies are discussed further, with potential options for changes or additions, in the *Policy Discussion* section.

Spatial Analysis Results

The information that follows is in regards to what is currently known about existing beachfront protective structures, as well as eligibility for BPS based on current laws. All beach alteration permits submitted to OPRD have been included in this analysis through the end of 2014; the goal 18 eligibility inventory is complete and verified as of the end of 2014, as well.

Statewide Summary

Existing Beachfront Protective Structures

- 1, 290 total beachfront protective structures were mapped along Oregon’s oceanfront coastline (Figures 3 and 4)

An individual BPS corresponds with the length of one tax lot; however, multiple structures may belong to a single permit record (i.e. many property owners file a permit request jointly so their structures connect for maximum effectiveness). Additionally, multiple permit records may exist for the same structure, likely because the structure was rebuilt or an emergency permit was later replaced with a permanent permit, which is a current OPRD requirement of all emergency permits.

- There are 683 records related to permits for BPS (as of December 2014), though some of these records are for permit applications that were denied or withdrawn, or approved and never built.
 - 119 of those BPS permit records are designated as “unpermitted,” meaning a structure appears to exist in the location, but no formal permit was found corresponding to that structure.

Many undocumented BPS exist on Oregon's coast. Potential reasons for unpermitted structures are:

- They were constructed prior to permitting requirements (or at least before permanent records were kept);
- They were inland of the statutory vegetation line (and a permit was not required);
- Permit documentation may have been misplaced in a transfer between agencies; or
- The structures may be illegal.

Information on the location, characteristics, and condition of all structures on Oregon's ocean shore—not just permitted structures—is important in management decision-making (e.g. consideration of a new BPS permit application) and so an effort was made in this project to capture all (permitted and unpermitted) BPS. BPS can include many different types of designs. The inventory of structures in Oregon includes riprap revetments (most common), seawalls and/or retaining walls, vegetated or clay berms, beach access ways, gabions, geotextile pillows with plantings, cobble berms, and rock and log revetments. (For additional details on the database which houses BPS information, including permit and repair records, please see Appendix B.)

These structures total **22.48 miles of coastline** along Oregon’s coast, which makes up about 5.4% of the total coastline. The length of Oregon’s total coastline used in this analysis is 416.5 miles, which was derived from Oregon’s enhanced CUSP (continually updated shoreline product). A breakdown of miles of armoring per County can be seen in Figure 1.

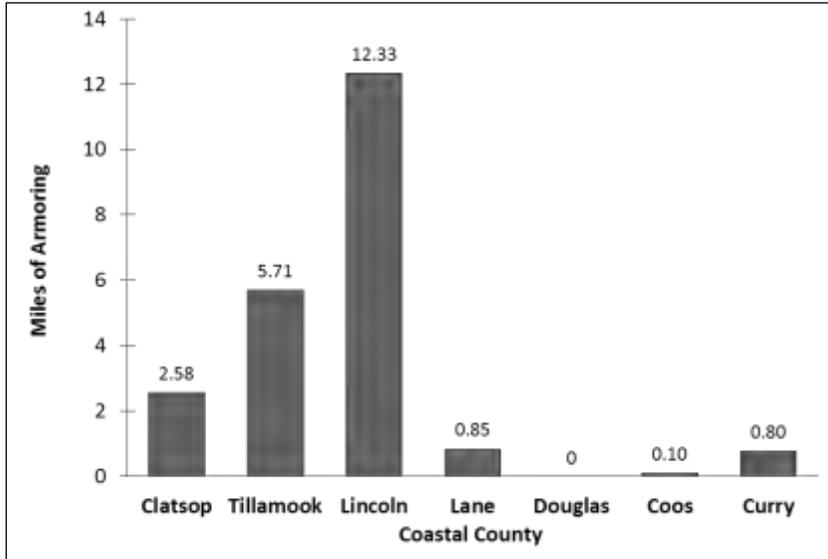


Figure 1 Miles of existing shoreline armoring per coastal county.

From Figures 1, 3, and 4, it is clear that the majority of armoring structures (92%) exist in the coastal counties of Clatsop, Tillamook, and Lincoln along the central and northern coasts. This trend corresponds to the most populated coastal areas. There are far less people living along the coast in Lane, Douglas, Coos, and Curry Counties. However, Tillamook County is an exception. With only about 23 people per square mile, its coastal area is sparsely populated but

extensively armored, indicating it is a highly vulnerable area to coastal erosion hazards. Other outside data and information supports this conclusion, as well. To see a further breakdown of these numbers per County, see the sections that follow.

REPAIRS

Number of BPS permits and repairs per year is shown in Figure 2. It is clear that the most applications for permits and repairs were made in 1999 (52 permits; 127 repairs), which was during and after a severe El Niño winter. Also, repairs appear to be increasing over time, while permits are staying relatively linear. As structures age, they are more likely to need repair and so it makes sense that requests for repairs increase over time.

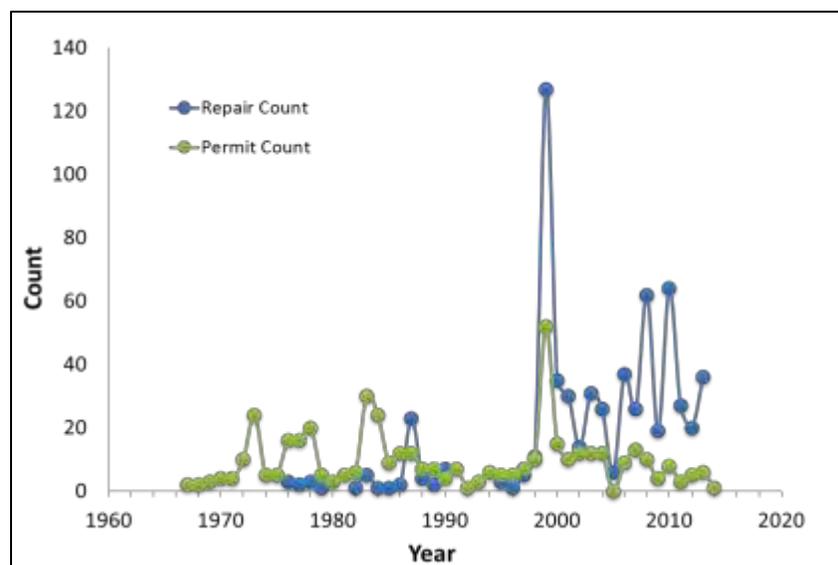


Figure 2 Numbers of BPS Permits and Repairs by Year.



Figure 3 Existing Beachfront Protective Structures (BPS) along the Oregon coast.

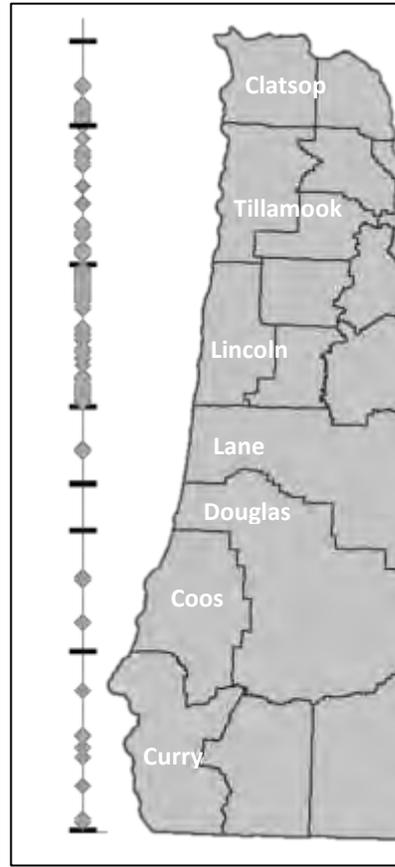


Figure 4 Center points of existing BPS distributed by coastal county.

The inventory contains a total of 631 repair records, all of which were recorded for Clatsop, Tillamook, and Lincoln Counties. The highest number of repairs made to one structure is 12, which was for a condominium unit in Neskowin (Figure 6). Thirteen structures have had six or more repairs. There are no recorded repairs in the southern coastal counties (Figure 5). Repairs may have occurred in these areas, but there is no record of them through OPRD.

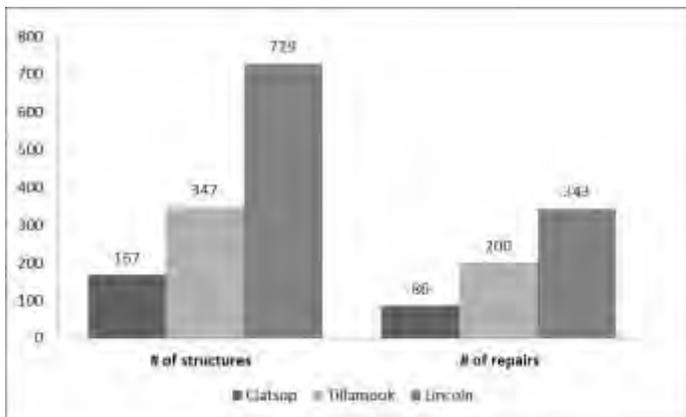


Figure 5 Number of structures and repairs for Clatsop, Tillamook, and Lincoln Counties.

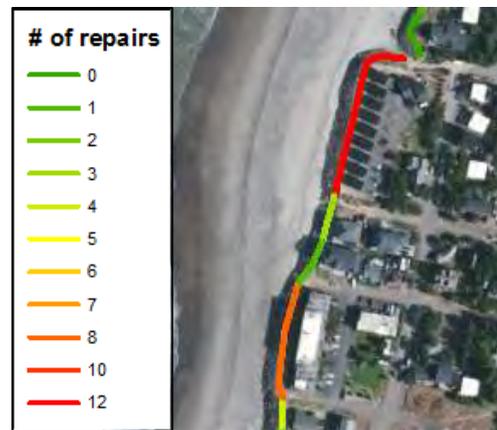


Figure 6 BPS by number of repairs. Red line indicates 12 repairs. Location: Neskowin, Tillamook County.

Eligibility for BPS permitting

For the coast wide inventory of eligibility determination for BPS permits, all coastal tax lots along the Oregon coast were analyzed. For details on the methods used to determine the eligibility status of these coastal tax lots, please see Appendix A. It should be noted that the Oregon coast includes a variety of land forms including rocky shores and some areas include a mix of these landforms. To insure the analysis was comprehensive, a determination was made on all parcels along the coast. Where it is determined through site-specific evaluation that particular properties are not subject to Goal 18, the BPS eligibility designation for these properties contained in the inventory does not apply.

As of the end of 2014, the coast contained 8,104 oceanfront tax lots with eligibility determinations. Of these, **3,332 are eligible and unarmored** and **3,460 are ineligible**. Those eligible and unarmored tax lots make up about 43 miles of coastline, which is almost double the amount of existing armoring. Not all of these areas are experiencing chronic erosion, but it is important to note this potential for future armoring and to look to these areas for alternative options. Most of this potential for armoring (71%) exists in Clatsop, Tillamook, and Lincoln Counties. However, that means the remaining roughly 350 miles of coastline is not subject to armoring, which is also a significant number. The sections that follow break down this information further, in order to determine where armoring exists currently, where it may exist in the future, and to better understand the most vulnerable coastal areas.

Figure 7 shows the number of coastal lots per County in terms of those designated eligible and armored, eligible and unarmored, and not eligible. **The percentages represent the portion of lots that are eligible and unarmored compared to all coastal tax lots for each county.**

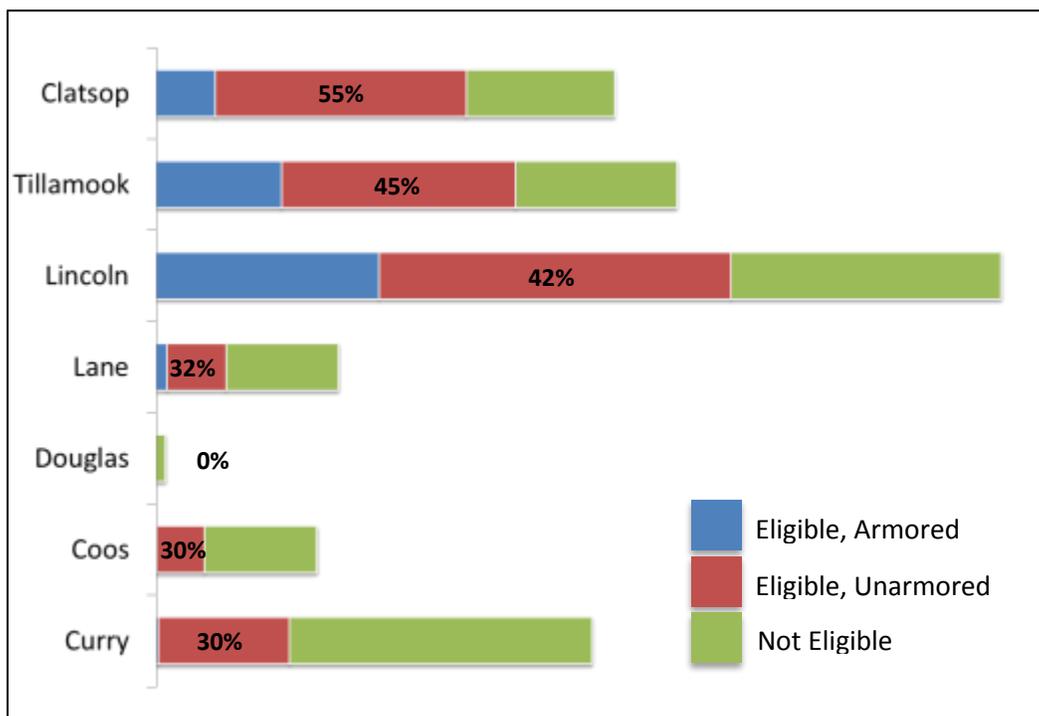


Figure 7 Number of eligible/armored, eligible/unarmored, and ineligible coastal tax lots for each coastal county.

Notes about how statistics were derived (for all jurisdictions):

- Vacant tax lots were derived using DOGAMI's building footprints in the coastal strip dataset, derived from 2009 LiDAR data, as well as visual inspection of aerial imagery.
- Urban Growth Boundaries (from 2012) were used to calculate numbers for each incorporated city with oceanfront mileage.
- Miles of Highway 101 along the oceanfront were approximated using a dataset from ODOT of Highway 101 line segments (those line segments that intersected the Goal 18 BPS Eligibility layer were considered oceanfront highway).
- The Goal 18 BPS Eligibility Inventory for the Oregon coast contains parcels that may not be directly on the oceanfront yet, but may become oceanfront in the future due to erosion. All parcels which contain an eligibility determination within this inventory were used in calculating statistics (except those with Goal 18 status of #5, which were left out since they are generally within the ocean shores state recreation area and are not developable).
- Ownership was used to determine whether coastal tax lots were publically owned. Publically owned tax lots include federal, state, and city or county owned land.

Clatsop County

Quick Facts:

- Population: 37, 474 (2014 estimate, US Census Bureau)
- Land Area: 829 sq miles
- Persons per sq mile: 45
- Oceanfront: 40 miles
- Existing Shoreline Armoring: 2.58 miles (6.5% of County coastline; 0.6% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 167 beachfront protective structures, totaling 2.58 miles
 - Clatsop County contains over 11% of the armoring on the coast and is the 3rd most armored County.
- 88 permit records; 86 recorded repairs to BPS
 - 37 of these repairs occurred in 1999 (El Nino year), most in the City of Cannon Beach.
- Most of Clatsop County's BPS were built before 1990 (73 out of 82 permits).

Eligibility for BPS permitting

Overview:

- 1,422 total coastal tax lots
 - 963 tax lots are eligible (68%)
 - 184 tax lots are eligible and already armored

- 779 tax lots are eligible but not yet armored (81% of eligible lots)
 - 459 tax lots are not eligible (32%)
 - 227 vacant oceanfront tax lots (excludes state parks lots)
 - 58 tax lots are vacant and eligible
 - 15 vacant lots are already armored (which includes 8 ineligible lots)
 - 84 coastal tax lots are publically owned (6% of all tax lots; all are ineligible for BPS permits)
 - 421 coastal tax lots are outside of UGB's in County jurisdiction (30% of all coastal tax lots)
 - Approximately 4 miles of Highway 101 in Clatsop County are oceanfront

CITY OF WARRENTON

- The City's only oceanfront tax lots are part of Fort Stevens State Park or are County owned; all are ineligible to apply for a BPS permit. None of its oceanfront coastline is armored.

CITY OF GEARHART

- 0 BPS
- 230 coastal tax lots
 - 177 tax lots are eligible, all are unarmored (77% of tax lots are eligible)
 - 53 tax lots are ineligible
- 24 vacant oceanfront tax lots (5 eligible, 19 ineligible)

CITY OF SEASIDE

- 8 BPS
 - 4 permit records; 0 recorded repairs
- 396 coastal tax lots
 - 334 tax lots are eligible
 - 62 tax lots are ineligible
- 22 vacant oceanfront tax lots (8 eligible, 14 ineligible)

CITY OF CANNON BEACH

- 113 BPS
 - 61 permit records; 73 recorded repairs
- 363 coastal tax lots
 - 256 tax lots are eligible
 - 107 tax lots are ineligible
- 19 vacant oceanfront tax lots (11 eligible, 8 ineligible)

Tillamook County

Quick Facts:

- Population: 25, 342 (2014 estimate, US Census Bureau)
- Land Area: 1,103 square miles
- Persons per square mile: 23
- Oceanfront (miles): 70 miles
- Existing Shoreline Armoring: 5.71 miles (8.2% of County coastline; 1.4% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 347 beachfront protective structures, totaling 5.71 miles
 - Clatsop County contains over 25% of the armoring on the coast and is the 2nd most armored County.
- 120 permit records; 200 recorded repairs to BPS
 - 32 of these repairs occurred in 1999 (El Nino year), and 45 repairs in 2008
 - Many of these repairs were in the unincorporated community of Neskowin.

Eligibility for BPS permitting

Overview:

- 1,615 total coastal tax lots
 - 1,116 tax lots are eligible (69%)
 - 389 tax lots are eligible and already armored
 - 727 tax lots are eligible but not yet armored
 - 499 tax lots are not eligible (31%)
- 426 vacant oceanfront tax lots (excludes state parks lots)
 - 206 tax lots are vacant and eligible
 - 72 vacant lots are already armored (which includes 5 ineligible lots)
- 72 coastal tax lots are publically owned (5% of all tax lots; all are ineligible for BPS permits)
- 1,094 coastal tax lots are outside of UGB's in County jurisdiction (68% of all coastal tax lots)
- Approximately 12 miles of Highway 101 in Tillamook County are oceanfront

CITY OF MANZANITA

- 1 BPS
 - 1 permit record; 0 recorded repairs
- 120 coastal tax lots
 - 70 tax lots are eligible
 - 23 tax lots are Goal 18 exceptions
 - 27 tax lots are ineligible
- 0 vacant oceanfront tax lots

CITY OF ROCKAWAY BEACH

- 115 BPS
 - 20 permit records; 37 recorded repairs
- 400 coastal tax lots
 - 22 tax lots are eligible
 - 364 tax lots fall with a Goal 18 exception
 - The oceanfront tax lots under a Goal 18 exception are also subject to the ocean setback line; land westerly of this line is not included in the exception area.
 - 14 tax lots are ineligible
- 66 vacant oceanfront tax lots (1 eligible, 61 subject to Goal 18 exception, 4 ineligible)

Lincoln County

Quick Facts:

- Population: 46, 406 (2014 estimate, US Census Bureau)
- Land Area: 980 square miles
- Persons per square mile: 47 (based on 2010 population)
- Oceanfront (miles): 73 miles
- Existing Shoreline Armoring: 12.33 miles (17% of County coastline; 3% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 729 beachfront protective structures, totaling 12.33 miles
 - Lincoln County contains about 55% of the armoring on the coast and is the most armored County.
- 356 permit records; 343 recorded repairs to BPS
 - 66 of these repairs occurred in 1998/1999 (El Nino year)

Eligibility for BPS permitting

Overview:

- 2,621 total coastal tax lots
 - 1,783 tax lots are eligible (68%)
 - 693 tax lots are eligible and already armored
 - 1,090 tax lots are eligible but not yet armored (61% of eligible lots)
 - 838 tax lots are not eligible (32%)
- 604 vacant oceanfront tax lots (excludes state parks lots)
 - 223 tax lots are vacant and eligible
- 97 coastal tax lots are publically owned (4% of all tax lots; all are ineligible for BPS permits)
- 1,201 coastal tax lots are outside of UGB's in County jurisdiction (46% of all coastal tax lots)
- Approximately 33 miles of Highway 101 in Lincoln County are oceanfront

CITY OF LINCOLN CITY

- 242 BPS
 - 2 permit record; 1 recorded repairs
- 537 coastal tax lots
 - 505 tax lots are eligible
 - 32 tax lots are ineligible
- 63 vacant oceanfront tax lots

CITY OF DEPOE BAY

- 2 BPS
 - 136 permit record; 89 recorded repairs
- 112 coastal tax lots
 - 67 tax lots are eligible
 - 45 tax lots are ineligible
 - Most of Depoe Bay’s oceanfront is rocky; the BPS eligibility requirement may not apply to most of this area, but a site specific determination would need to be made.
- 22 vacant oceanfront tax lots

CITY OF NEWPORT

- 26 BPS
 - 16 permit record; 3 recorded repairs
- 647 coastal tax lots
 - 305 tax lots are eligible
 - 342 tax lots are ineligible
- 256 vacant oceanfront tax lots

CITY OF WALDPART

- 9 BPS
 - 3 permit record; 1 recorded repairs
- 38 coastal tax lots
 - 35 tax lots are eligible
 - 3 tax lots are ineligible
- 4 vacant oceanfront tax lots

CITY OF YACHATS

- 20 BPS
 - 7 permit record; 1 recorded repairs
- 78 coastal tax lots
 - 45 tax lots are eligible
 - 33 tax lots are ineligible
- 11 vacant oceanfront tax lots

Lane County

Quick Facts:

- Population: 358,337 (2014 estimate, US Census Bureau)
- Land Area: 4,553 square miles
- Persons per square mile: 77 (based on 2010 population)
- Oceanfront (miles): 35 miles
- Existing Shoreline Armoring: 0.85 miles (2% of County coastline; 0.2% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 29 beachfront protective structures, totaling 0.85 miles
 - BPS accounts for 2.4% of the County's coastline and 0.2% of Oregon's coastline
- 5 permit records; 0 recorded repairs to BPS
 - Tax lots within "The Shores" subdivision are armored, despite not being eligible. In 1983, Division of State Lands (DSL) and the Parks and Recreation Division of the Department of Transportation granted emergency authorization for placement of riprap along the entire westerly boundary of The Shores Subdivision (2,680ft). A subsequent permit was granted by DSL for additional placement of riprap in the northern portion of the subdivision at Sutton Creek with County consistency approval; however, this riprap was not considered by the County to be within an estuary or on the ocean shore. Additionally, it appears that repairs have been made to ocean shore riprap along the northern section of the subdivision but no permit documentation can be located. Although it remains apparent that development within The Shores subdivision is not eligible for beachfront protective structures, this issue may be subject to debate in the future especially for repairs to existing riprap.

Eligibility for BPS permitting

Overview:

- 566 total coastal tax lots
 - 217 tax lots are eligible (38%)
 - 35 tax lots are eligible and already armored
 - 182 tax lots are eligible but not yet armored (84% of eligible lots)
 - 349 tax lots are not eligible (62%)
- 189 vacant oceanfront tax lots (excludes state parks lots)
 - 35 tax lots are vacant and eligible
 - 9 vacant lots are already armored (all of which are ineligible lots)
- 98 coastal tax lots are publically owned (20% of all tax lots; all are ineligible for BPS permits)
- 278 coastal tax lots are outside of UGB's in County jurisdiction (49% of all coastal tax lots)
- Approximately 18 miles of Highway 101 in Lane County are oceanfront

CITY OF FLORENCE

- 29 BPS
 - 5 permit records (4 of which are “unpermitted” – meaning no formal permit record found);
0 recorded repairs
- 287 coastal tax lots
 - 149 tax lots are eligible
 - 138 tax lots are ineligible
- 97 vacant oceanfront tax lots

Douglas County

Quick Facts:

- Population: 106,972 (2014 estimate, US Census Bureau)
- Land Area: 5,036 square miles
- Persons per square mile: 21 (based on 2010 population)
- Oceanfront (miles): 26 miles
- Existing Shoreline Armoring: 0 miles

Existing Beachfront Protective Structures

Overview:

- 0 beachfront protective structures
- 0 permit records; 0 recorded repairs to BPS

Eligibility for BPS permitting

Overview:

- 29 total coastal tax lots (all are in County jurisdiction)
 - 0 tax lots are eligible
 - 29 tax lots are not eligible (100%)
- 3 vacant oceanfront tax lots (excludes state parks lots)
 - 0 tax lots are vacant and eligible
 - 0 vacant lots are already armored
- 26 coastal tax lots are publically owned (90% of coastal tax lots)
- Approximately 3 miles of Highway 101 in Douglas County are oceanfront

Coos County

Quick Facts:

- Population: 62,475 (2014 estimate, US Census Bureau)
- Land Area: 1,596 square miles
- Persons per square mile: 40 (based on 2010 population)
- Oceanfront (miles): 68 miles
- Existing Shoreline Armoring: 0.1 miles (0.2% of County's coastline; 0.02% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 6 beachfront protective structures, totaling 0.1 miles
- 6 permit records; 0 recorded repairs to BPS

Eligibility for BPS permitting

Overview:

- 499 total coastal tax lots
 - 151 tax lots are eligible (30%)
 - 3 tax lots are eligible and already armored
 - 148 tax lots are eligible but not yet armored (98% of eligible lots)
 - 348 tax lots are not eligible (70%)
- 149 vacant oceanfront tax lots (excludes state parks lots)
 - 17 tax lots are vacant and eligible
 - 1 vacant lot are already armored
- 99 coastal tax lots are publically owned (20% of coastal tax lots)
- 223 coastal tax lots are outside of UGB's in County jurisdiction (45% of all coastal tax lots)
- Approximately 1 mile of Highway 101 in Coos County is oceanfront

CITY OF BANDON

- 3 BPS
 - 3 permit record; 0 recorded repairs
- 276 coastal tax lots
 - 110 tax lots are eligible
 - 2 tax lots are Goal 18 exceptions
 - 164 tax lots are ineligible
- 79 vacant oceanfront tax lots (13 eligible, 66 not eligible)

Curry County

Quick Facts:

- Population: 22,335 (2014 estimate, US Census Bureau)
- Land Area: 1,628 square miles
- Persons per square mile: 14 (based on 2010 population)
- Oceanfront (miles): 106 miles
- Existing Shoreline Armoring: 0.8 miles (0.8% of County’s coastline; 0.2% of total coastline)

Existing Beachfront Protective Structures

Overview:

- 12 beachfront protective structures, totaling 0.8 miles
- 13 permit records; 0 recorded repairs to BPS

Eligibility for BPS permitting

Overview:

- 1,352 total coastal tax lots
 - 414 tax lots are eligible (31%)
 - 8 tax lots are eligible and already armored
 - 406 tax lots are eligible but not yet armored (98% of eligible lots)
 - 938 tax lots are not eligible (69%)
- 318 vacant oceanfront tax lots (excludes state parks lots)
 - 54 tax lots are vacant and eligible
 - 0 vacant lots are already armored
- 108 coastal tax lots are publically owned (8% of coastal tax lots)
- 456 coastal tax lots are outside of UGB’s in County jurisdiction (34% of all coastal tax lots)
- Approximately 54 miles of Highway 101 in Curry County are oceanfront

CITY OF PORT ORFORD

- 1 BPS
 - 1 permit record; 0 recorded repairs
- 159 coastal tax lots
 - 48 tax lots are eligible
 - 111 tax lots are ineligible
- 71 vacant oceanfront tax lots (19 eligible, 52 not eligible)

CITY OF GOLD BEACH

- 3 BPS
 - 4 permit records (2 “unpermitted”); 0 recorded repairs
- 190 coastal tax lots
 - 56 tax lots are eligible
 - 134 tax lots are ineligible
- 48 vacant oceanfront tax lots (15 eligible, 33 not eligible)

CITY OF BROOKINGS

- 2 BPS
 - 3 permit record; 0 recorded repairs
- 545 coastal tax lots
 - 175 tax lots are eligible
 - 370 tax lots are ineligible
- 87 vacant oceanfront tax lots (82 eligible, 5 not eligible)

Data Summary

From the spatial analysis and stakeholder interviews (see *Appendix C* for interview summaries), the coast can be qualitatively categorized in terms of vulnerability to coastal erosion hazards and potential for future armoring (high, moderate, or low vulnerability):

- **Clatsop County – Moderate**

- While Clatsop County does have a higher coastal population density than many of the other coastal counties, many areas have employed strict setbacks along the oceanfront and there has been significant sand build up over time which has created a natural buffer to erosion hazards in many areas (especially Clatsop Plains). The exceptions to this are those areas within the urban growth boundaries (UGB's) of Seaside and Cannon Beach, which have highly developed oceanfront areas. The most vulnerable area in County jurisdiction is Arch Cape.

- **Tillamook County – High**

- Tillamook County has a moderately low coastal population density, but has the second highest amount of existing shoreline armoring (5.7 miles, which is about 8.2% of its total coastline length). Also, about 45% of its coastal tax lots are eligible for armoring, but not yet armored. The City of Rockaway Beach and the community of Neskowin are especially prone to erosion and have significant amounts of development right along the oceanfront at risk from coastal erosion. Pacific City (and just north) also has a significant amount of armoring along the oceanfront; however, most of this is currently buried under sand due to sand buildup over the last decade. This area may become vulnerable again in the future because it is low-lying. Most of the oceanfront tax lots in Tillamook are in County jurisdiction (68%), which is important for the management of this area. Overall, with climate change factors and potential future population growth and development, Tillamook County's oceanfront is at high risk from coastal erosion.

- **Lincoln County – High**

- Lincoln County is the most densely populated coastal county and the most developed. It has the highest amount of existing armoring (12 miles, which is 17% of its total coastline length), and a high percentage of coastal tax lots that are eligible but not yet armored (42%). Many of its coastal cities, as well as areas in the County's jurisdiction are right along the oceanfront, with little buffer room, and are highly prone to coastal erosion hazards. Overall, Lincoln County's oceanfront is at high risk from coastal erosion due to its existing development, climate change risk factors, and future predictions for additional growth and development.

- **Lane County – Low**

- Lane County has very little existing armoring (0.9 miles; 2.4% of its coastline) and little oceanfront development along its coastline. Also, about 20% of its oceanfront tax lots are in public ownership (local, state, and/or federal), which will prevent armoring of those areas and provide room for natural erosion processes. Florence is the only City with oceanfront tax lots. Just north of Florence, within its UGM, a significant number of tax lots are already armored (although this armoring fronts ineligible properties that were permitted via an emergency permit by the Department of State Lands). This armoring is also mostly buried currently. Overall, Lane County has low vulnerability to coastal erosion hazards due to its low development and potential for development along the oceanfront.

- **Douglas County – Low**

- Douglas County has the lowest overall vulnerability to coastal erosion because 90% of its oceanfront tax lots are publically owned and 100% of its oceanfront tax lots are ineligible for shoreline armoring. No armoring exists and there is no potential for armoring. Additionally, there is little to no development near the oceanfront, so there is no significant risk from coastal erosion now or into the future.

- **Coos County – Low**

- Coos County also has low overall vulnerability to coastal erosion. Only 0.1 mile is already armored, which is 0.15% of the County’s coastline. While many of its eligible coastal tax are not yet armored (~30%), 70% of its coastal tax lots are not eligible and 20% of its coastal tax lots are publically owned, so there is little potential for future armoring. Additionally, there is little development currently at risk from erosion hazards and future population projections remain low for this area. Bandon is the only city with oceanfront, and while some of its development may be at risk from erosion, it is not currently a coastal erosion “hot spot”. Lastly, sea level rise is not a significant factor here for the next forty years because of tectonic uplift. Even as the rate of SLR increases into the future, it will have little impact on the County if oceanfront development remains low.

- **Curry County – Low/Moderate**

- Curry County has low to moderate overall vulnerability to coastal erosion. Of its 106 miles, 0.8 mile is already armored, which is 0.2% of the County’s coastline. The majority (69%) of the County’s coastal tax lots are not eligible, so there is low potential for future armoring. Port Orford, Gold Beach, and Brookings all have oceanfront tax lots and there is development at risk from erosion hazards in these areas, as well as some areas within the County’s jurisdiction. The community of Nesika Beach (north of Gold Beach) is particularly vulnerable and has experienced significant bluff erosion which has substantially damaged a number of dwellings. Overall, Curry County’s vulnerability is low; however, if more development were to occur along the oceanfront, vulnerability to erosion would increase.

Policy Discussion: Options for the Future

As outlined in the *Current Policies* section of this report, there are several state and local policies already in existence that address the permitting of shoreline armoring and development within coastal hazard areas. Overall, these policies are fairly comprehensive and effective at striving to balance the protection of the public beach and the protection of private property. The following are some strengths and challenges of the policies at the state level related to eligibility (Goal 18) and permitting (OAR 736 Div 20) requirements.

Strengths:

- Current policy limits and discourages shoreline armoring through the eligibility requirements (grandfathering of development on or before January 1, 1977)
- Eligibility for armoring based on this development date can be applied broadly to the entire coast
- Current policy process works well within the existing land-use framework

Challenges:

- Eligibility policy does not correspond with geography or physical processes
 - A “saw-tooth” pattern of eligibility can create problems for BPS permits
- Criteria for permitting structures (within OAR 736, Div 20) is ambiguous
- Vacant lots and street ends sometimes get armored
- Current science is not well integrated into structure design
- Knowledge gaps remain on cumulative impacts of BPS
- Current policies do not address climate change or future adaptation planning



"Saw-tooth" pattern of eligibility

This section aims to provide a few policy options that may strengthen or clarify, as well as expand upon, existing policies aimed at BPS permitting, eligibility, and development in coastal erosion hazard zones. Both state and local policy ideas are put forth for future discussions and next steps. This is not a comprehensive or exhaustive list, but rather a sampling of some of the ideas presented through stakeholder interviews, informal discussions with experts, and trends seen in the spatial data.

Statewide Policy Ideas

BPS PERMITTING REQUIREMENTS

Definition of BPS

Currently, there is no definition of “beachfront protective structure” in law. There is a definition for “riprap” and “structure” in the Definitions section of Oregon’s Statewide Planning Goals, and there is a definition for “improvement/alteration” in the Definition section of OAR 736, Division 20.

- *“Riprap”* – A layer, facing, or protective mound of stones randomly placed to prevent erosion, scour or sloughing of a structure or embankment; also, the stone so used. In local usage, the similar use of other hard material, such as concrete rubble, is also frequently included as riprap.
- *“Structure”* – Anything constructed or installed or portable, the use of which requires a location on a parcel of land.
- *“Improvement”* – Filling a portion of the ocean shore; removal of material from the ocean shore; or a structure, appurtenance or other addition, modification or alteration constructed, placed or made on or to the land (ORS 390.605(1)). For the purpose of these rules, the term “alteration” shall be used in place of “improvement” except as otherwise specified in these rules.

Currently, non-structural alternatives, like cobble revetments, may fall within the definition of riprap and so would need to meet Goal 18 eligibility requirements and OPRD permitting requirements. Many experts do not think a cobble revetment should be considered a riprap or structure because it is meant to mimic natural beach characteristics and move dynamically with beach processes, while others are concerned about cobble revetments as they have the potential to impact the natural beach and associated organisms. These issues will require further collaborative discussion.

Policy Option: Create a definition for beachfront protective structure (BPS) for the Statewide Planning Goals in order to clarify what is meant by BPS and what is subject to the Goal 18 eligibility requirements. It could be written so as not to include dynamic revetments, or other natural and non-structural options, but to ensure that all engineered and structural options are included and are subject to eligibility requirements (e.g. seawalls, riprap). Additionally, the definition of “riprap” should be updated to more accurately reflect what is meant by the word. This option may take some careful discussion and coordination with relevant stakeholders.

Ocean Shore Permit Application Review Process

As mentioned in challenges to current policy, some of the criteria for evaluating a BPS permit under OAR 736, Division 20 are ambiguous, which is acknowledged as an issue by many in this field. In the past (2012), a team of staff from OPRD did review the rule language with potential clarifications and updates. However, the process was never completed, and the rule language has not been updated.

Policy Option: If the issue were to be pursued again, there are many areas that could be further addressed or clarified in the rule language (OAR 736, Div 20), or through updating internal policies related to BPS permitting. Examples of things to address could be:

- Requirements for geologic reports:
 - All BPS permits would require a geologic report (not just for those greater than 50 feet in length). This option would require a rule change.
 - Additional report requirements as proposed by the Coastal Hazards and Processes Working Group, including addressing sea level rise and other climate change factors. This option could be achieved through policy changes.
- BPS built behind the statutory vegetation line – to address those “pre-emptive” structures that are built to protect private property outside of OPRD’s jurisdiction, mostly on properties that do not meet Goal 18 eligibility requirements.
 - A rule change to address these structures directly and clarify OPRD’s authorization to require homeowners to obtain a permit or remove these structures if a permit could not be granted once they are within OPRD’s jurisdiction.
 - Alternatively, local jurisdictions could require a permit process for the construction of these structures on a homeowner’s oceanfront property if proposed landward of OPRD’s jurisdiction. Eligibility could be determined at that time.
- Additional criteria for evaluating a BPS permit:
 - Threshold for relocating a house vs. building a BPS. Cost is usually the most common reason for not moving a house and instead wishing to build a riprap structure. However, additional factors could be evaluated besides cost to make a more objective and fair assessment of the feasibility of house relocation.
 - Cumulative impacts: a new BPS permit could be evaluated on its impacts to the entire littoral cell rather than just what is at risk for one property owner.
 - Include definitions of hard vs. soft engineering solutions so it is clear what is subject to eligibility and OPRD’s permitting requirements.
 - Include an emphasis on trying alternative solutions (e.g. vegetative plantings) to mitigate erosion before asking for a BPS permit. Applicant must show reasons why alternatives did not work.
 - A statement in rule to expressly prohibit homeowners from reclaiming their lost oceanfront property by filling in the beach.
 - Specific criteria for when to allow an emergency permit. For example, an emergency permit can only be considered when oceanfront property is less than 50ft from a house.
 - Criteria for when to allow the armoring of a vacant oceanfront lot. For example, only when BPS is required to protect houses on either side of the vacant lot, but otherwise, a vacant lot cannot be armored.
 - Design standards for riprap and seawalls. Currently OPRD staff depend upon recommendations as outlined in the geologic reports, but there are no design standards for BPS in rule.

DSL vs. OPRD Jurisdiction

Currently, jurisdiction can change between DSL and OPRD around creeks, rivers, and estuaries (e.g. when a creek changes paths). This can make permitting and other jurisdiction functions confusing.

Policy Option: It may make sense for OPRD to have complete jurisdiction over the mouths of small creeks that are subject to constant movement (e.g. Hunter Creek and Sutton Creek). These creek mouths could be mapped and placed into the jurisdiction of OPRD, with consultation from DSL.

Mitigation Banking

Mitigation banking resources could be used in the littoral cell in which a beachfront protective structure project is being built (or rebuilt), in order to offset or compensate for the expected adverse impacts of the BPS to the system. Some of the potential mitigation efforts could include creating or updating public beach access points, research and monitoring of the structure and cumulative impacts of armoring in the littoral cell over time, and/or local beach nourishment projects.

Policy Option: In addition to those revisions discussed above, an additional requirement could be added to OAR 736, Division 20 related to the permitting of BPS. An additional fee would be assessed on the homeowner(s) who submitted the application for: any new BPS built; significant rebuilds of existing structures; any repair over 50 cubic yards in volume; or any repetitive repair. The mitigation fees could be assessed on a sliding scale based on the magnitude of the project or repair and the decisions for how to use and distribute the money could be overseen by OPRD with input from other relevant state agencies and local stakeholders (e.g. OR Department of Fish and Wildlife, the Department of Geology and Mineral Industries, Oregon Surfrider Foundation, Oregon Shores Conservation Coalition, and the local jurisdictions). The main purpose of this requirement would be to try to further understand the impacts of BPS, mitigate for some of these impacts, and to transfer the burden of the costs of BPS to the oceanfront homeowners rather than the public.

GOAL 18 ELIGIBILITY REQUIREMENTS

Highway 101

Currently, under Goal 18, Implementation Requirement 5, only private property and infrastructure may be eligible for a BPS permit. Public facilities and development, including public roads, are not included in the definition of development in the Goal language. Some sections of state Highway 101 are oceanfront and vulnerable to the hazards of coastal erosion – about 123 miles total (though not all of this mileage is vulnerable to erosion). This highway is an essential lifeline road that connects coastal communities and



Figure 8 Sections of Highway 101 that are ocean-fronting.

provides connections back to the rest of the State. If the road were to become inaccessible, it could cause major challenges for transportation and safety. While there may be options for the road to be moved or re-routed in some areas, this option may be extremely costly; impact pristine or sensitive habitats; and/or be infeasible because of the mountainous and landslide-prone terrain.

Policy Option: An option would be to allow some sections of Highway 101 that are ocean-fronting to be included within the definition of “development” in Goal 18 Implementation Requirement 5 and allow them to apply for a BPS permit through OPRD. This option would apply only to Highway 101 (not any other public facility or roads), and only those sections that are at greatest risk from coastal erosion hazards. Most oceanfront sections of highway (Figure 8) occur in Curry County, but there are at least a few areas in Lincoln and Lane Counties that have had erosion issues in the past where this policy option may be needed. In order to move this issue forward, coordination would with the Oregon Department of Transportation would be required, as well as the relevant County and City officials, and any other affected stakeholder groups. These discussions have occurred in the past and were very controversial and would likely continue to be controversial.

Saw-tooth Patterns of Eligibility

There are some areas of the coast that have a problematic “saw-tooth” pattern of eligibility that may make BPS permitting difficult. This pattern occurs when an ineligible tax lot is surrounded by eligible tax lots. A continuous line of armoring is usually the most effective at mitigating the effects of erosion to private property. There is the potential for a few ineligible coastal tax lots to create gaps in an otherwise continuous line of armoring, which can exacerbate localized scour and create an uneven coastline.

Policy Option: For areas where this issue creates a problem for protecting eligible properties, a local jurisdiction could propose a Goal 18 exception to those properties that are currently ineligible. A strong case would have to be made for why the ineligible properties should be granted eligibility; for example, only those lots located on high bluffs and where the space between ineligible and eligible lots is no more than 150ft. This allowance would take some more in-depth thinking about criteria for granting an exception, which should include applicable state agencies. This option might include a tradeoff which potentially increases setbacks in some less developed areas (which would decrease the potential need for a BPS) if “saw-tooth” areas received decreased regulation.



“Saw-tooth” pattern in Gleneden Beach,

To reiterate, the ideas presented here for changes and additions to statewide policies are not exhaustive. In many ways, the state policies are already effective at regulating shoreline armoring equitably and broadly along the coast. Opening the policies up for revisions may prove problematic or politically infeasible. On the other hand, local government policy changes or additions may be a more

effective way to try to address some of the current policy challenges related to shoreline armoring and coastal erosion risks. Local efforts can be tailored to each jurisdiction and its unique geography and social context, and local efforts can be more restrictive than statewide policies. Several local policy ideas are explored next.

Local Government Policy Ideas

NESKOWIN MODEL:

The community of Neskowin in Tillamook County is particularly vulnerable to coastal erosion. The oceanfront lots are almost completely armored along the entire length of the community and there is little to no buffer of land between houses and the beach. The community came together in 2009, with help from the County and several state agencies, and developed a Coastal Erosion Adaptation Plan in 2013. This plan contains recommendations and actions, which strive to maintain the public beach and protect the community over the short and long term. These items have now been adopted into Tillamook County's Comprehensive Plan and Implementing ordinances.

Local Policy Option: The process Neskowin used to plan for coastal erosion, as well as the final recommendations, actions, and documents produced along the way, are all great resources that can be adapted and utilized by any local jurisdiction along the Oregon coast. This model may be a valuable resource to DLCDC moving forward in assisting coastal jurisdictions dealing with coastal erosion and other coastal hazards. All of the recommendations can be utilized, though only a handful of those items will be discussed in this section.

ADDITIONAL LAND-USE REQUIREMENTS

A good way to reduce risk to coastal hazards is to reduce exposure. Removing or preventing development from occurring in the most vulnerable areas to coastal erosion and other coastal hazards is one way to reduce risk by reducing exposure.

Coastal Hazards Overlay Zone

Policy Option: Communities could adopt a coastal hazard overlay zone to identify areas subject to chronic coastal natural hazards (including ocean flooding, dune and bluff erosion, dune accretion, landslides, and inlet migration); and to manage development in these areas to reduce risk to life and property. Neskowin used mapping done by DOGAMI to outline their coastal hazard overlay zone. Any land that falls within this zone is subject to a set of additional provisions aimed at reducing exposure to coastal hazards. Some of the following ideas are from the work of the Neskowin Coastal Hazards Committee, while other ideas are from other stakeholder groups. Potential requirements for land within the Coastal Hazard Overlay Zone include:

- Strong setback minimums imposed on any new development or substantial improvement. This would be especially important in areas with vacant oceanfront areas that are still developable.
- A geologic report by a certified engineering geologist for any new development or substantial improvements, which should follow best practice guidelines for publishing such reports.
- Safest site – all new construction and substantial improvement should be located within the area most suitable for development based on the least exposure to risk from coastal hazards as determined in the geologic report.
- Not allowing development to occur if the geologic report says a house will only be safe if a BPS is constructed in front of the lot first. This is not consistent with the original intention of the Goal 18 eligibility requirement which was a grandfathering clause to protect homes that were already built. New development should take coastal hazards into consideration.
- Density restrictions – only single family homes permitted for new construction and substantial improvements. Additional dwelling units prohibited on lots with existing dwellings.
- Moveable structure design – to facilitate the relocation of structures that become threatened by coastal hazards (e.g. stem wall foundation systems). Alternatively, break-away walls on structures built on pilings may be an appropriate design for communities prone to coastal flooding.
- Hazard disclosure statement – signed by property owner acknowledging the property is subject to potential chronic natural hazards and the development is at risk of damage from such hazards; accepts and assumes all risks of damage from natural hazards; and understands the content of the geologic report for their property.
 - Local jurisdiction should also notify the landowner of the parameters of the Goal 18 eligibility requirement and let them know that partitions and further divisions of land may take away their eligibility status.

BPS Permitting at Local Level

As mentioned already, some homeowners have built beachfront protective structures behind OPRD’s jurisdiction. At least in some circumstances, it appears that the intent could be to circumvent OPRD and Ocean Shore regulations as these structures are purposely built to protect the subject property at some future date. They can usually be found at properties that are ineligible and do not meet Goal18 requirements. OPRD cannot permit these structures, but local jurisdictions could.

Policy Option: If a homeowner wants to engineer a structure on their property to protect themselves from erosion at a later date, the local jurisdiction could require a development permit for this action. The permit could require compliance with Goal 18 eligibility since the structure’s intention is to armor the coastline. Alternatively, this permit could notify the homeowner that once the structure becomes exposed and falls under OPRD’s jurisdiction, they will be required to remove it (if the property is not eligible), or that an OPRD permit will be required.

Additionally, a local jurisdiction could require their own BPS permit for any BPS, even those that are already permitted by OPRD. This additional permit could further specify criteria for approving a new

structure, such as a more stringent alternatives analysis that focuses on moving development further back on the lot (regardless of cost), or requires a structure to be built at or behind the actual vegetation line wherever possible to minimize impacts to the public beach. This option would require significant coordination between the local government and OPRD.

Stormwater and Erosion Control

Coastal processes are not the only factors that cause erosion. Development practices and stormwater discharge can also cause erosion to land, which can lead to failure of dunes, bluffs, and BPS along the oceanfront. It is important for development practices in a community to address ways to reduce stormwater and implement erosion control measures.

Policy Option: All applications for development must show plans for control of erosion and sedimentation during construction and other ground disturbing activities. Applications for development should also include plans for long-term management of stormwater that accommodates increased runoff and provides permanent drainage.

Planning for the Future

Most jurisdictions do not have a plan in place for how to deal with development and infrastructure that becomes threatened by coastal hazards or for development and infrastructure that may become subject to hazards in the future. As sea levels rise and storms intensify, there may be a point at which houses are no longer safe to live in because of the risk. Not only will there be issues of displacement of the property owners, but also issues associated with the unsafe house (e.g. loose debris and beach impacts, septic system leaks, hazardous fuels and chemicals, etc.).

Policy Option: It may be of interest for communities, particularly those vulnerable to coastal hazards, such as erosion, sea level rise, flooding, and tsunami inundation, to initiate future planning for recovery from many different types of disasters and potentially reserving land away from the oceanfront for those who become displaced. This may include developing a local taxing district to help offset some of the costs associated with disaster relief or resilience capacity building.

Moving Forward

The challenge with changing land-use policies at the local or state level is that it can conflict with private property rights. Some of these ideas may be politically infeasible in certain jurisdictions; however, as time progresses and erosion and other coastal hazards continue to plague coastal communities, these ideas and others may gain traction. Options such as buyouts may become more feasible. The more proactive a community can be to start to think about and discuss these options, the more resilient they will potentially be moving forward. In addition, it is important to remember that planning for a tsunami, climate change, and/or natural hazards can be integrative and complementary; planning for one can help alleviate challenges from another.

With any of these policy options, especially those at the local level, funding and adequate staffing will be critical in implementing these changes. It will be important for the relevant state agencies to continue to give technical assistance, guidance, and financial support to local communities dealing with the effects of coastal hazards.

These policy options are meant to be a springboard for additional discussions around issues of shoreline armoring and coastal erosion along the Oregon coast. It is recommended that these and other ideas continued to be explored with interested and relevant stakeholder groups, especially in those communities most affected by coastal erosion (i.e. Tillamook County, Lincoln County, Rockaway Beach, Lincoln City, etc.), in order to refine ideas and decide whether changing or creating new policies is the right course to pursue.

Additional Resources

The following resources were used for background information in this report. They also may be useful resources for those interested in this issue and in the policy ideas section.

American Shore and Beach Preservation Association. 2013. *Storm protection: it's way more than that* [press release]. Retrieved from:
http://www.asbpa.org/news/newsroom_13BN0924_storm_protection_more.htm.

Dalton, M.M., P.W. Mote, and A.K. Snover [Eds.]. 2013. *Climate Change in the Northwest: Implications for Our Landscapes, Waters, and Communities*. Washington, DC: Island Press.

Envision – Tillamook County Coastal Futures Project:
<http://envision.bioe.orst.edu/StudyAreas/Tillamook/>.

National Research Council. 2012. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present and Future*. The National Academies Press, Washington DC.
http://www.nap.edu/catalog.php?record_id=13389

Neskowin Coastal Hazards Committee. June 2013. *The Neskowin Coastal Erosion Adaption Plan*. Tillamook County, OR. <http://www.co.tillamook.or.us/gov/ComDev/>.

The Oregon Climate Change Adaptation Framework (OCCAF). Dec 2010. State of Oregon.
<http://oregonexplorer.info/FacingClimateChange>

OPRD (M.S. Lorang). 1994. *Coastal Erosion and Shore Protection: Conceptual Alternatives to Conventional Rip-rap Shore Protection Structures*. Corvallis, OR: Applied Coastal Science, Inc.

Oregon Parks and Recreation Department (OPRD). October 2010. *Climate Change Response: Preparedness and Action Plan*.
http://www.oregon.gov/oprd/NATRES/docs/oprdclimatechangeplan_forcommission_forweb.pdf

Oregon Coastal Planners Network

Fall 2015 Webinar



October 22nd, 2015
10:00am

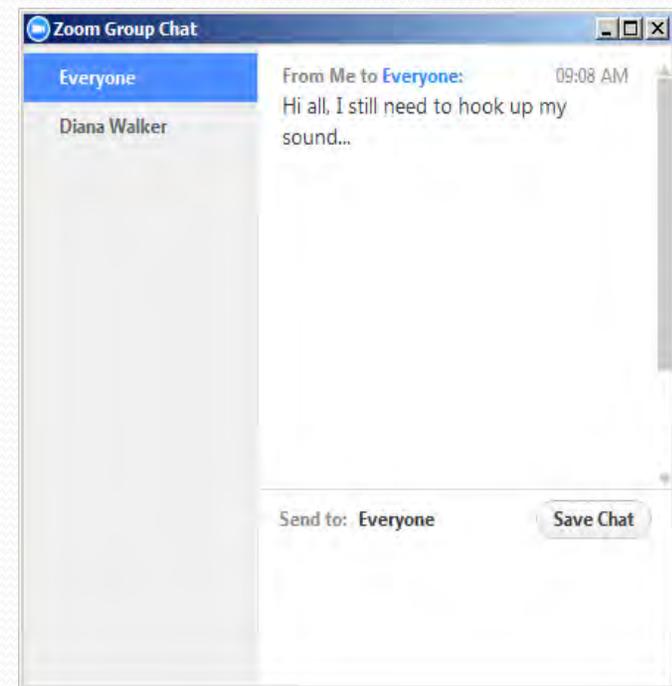
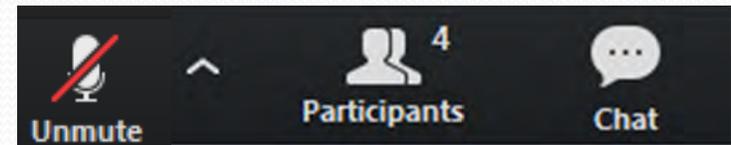


Webinar Agenda

- Federal and State Funding Update - Patty Snow
- Status of the HUD Natural Disaster Resilience Grant - Dave Perry
- Introduction of Sea-level Rise Vulnerability Inventory - Julie Sepanik
- Introduction of New Estuary Project of Special Merit - Andy Lanier
- Shorezone Project Update and New Products- Andy Lanier
- Coastal Hazard Planning Updates - Laren Woolley
- Input on Spring Meeting Topics

Housekeeping

- To improve the quality of the audio for everyone, please mute yourself while presentations are in progress 😊
- Feel free to unmute yourself when you have a question
- If you have trouble with audio, or want to ask a question but do not have a microphone, use the Zoom Group Chat option, and we will read it to everyone.





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State and Federal Funding Updates

- 30% of NOAA Section 306 Grant Withheld Due to Coastal Nonpoint Source Pollution Program Disapproval
- No E-board this year
- Board of Forestry November Rule Making
- General Fund Request at February Legislative Session
- Application for NOAA Community Resilience Grant (1 of 140 nationwide)
- NOAA 312 Evaluation of the OCMP in 2016



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HUD Natural Disaster Resilience Grant

- Oregon is applying for HUD National Disaster Resilience Competition (NDRC) funds.
- The objective is to create a cohesive coastal resilience program that will strengthen partnerships among governments, non-profits and philanthropists and create a unified mission.
- Oregon will utilize the Governor's Regional Solutions framework to identify the best and most effective projects



HUD Natural Disaster Resilience Grant

- The State's main objective is to coordinate a resiliency strategy, which will be called the *Oregon Rural Resilience Incubator*.
- The *Oregon Rural Resilience Incubator* will be pilot tested in the coastal communities of Brookings and Reedsport, that have experienced qualifying disaster events and are prepared to support the program with local participation and other resources.



HUD Natural Disaster Resilience Grant

- The NDRC grant would provide much needed resources to these communities.
- The *Oregon Rural Resilience Incubator* will allow our target areas to frame their needs and then work closely with partners to identify and implement the most impactful CDBG-NDR eligible projects.





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Sea-level Rise Vulnerability Inventory

NOAA Coastal Management Fellow Project (ongoing until December 2017)

- Goals

1. Provide useful information to local communities on their asset exposure to sea-level rise.
2. Provide an asset inventory to be used as the first step in adaptation planning at the local level.

- Project Area

- 22 estuaries and adjacent shorelands with estuary management plans

- Create sea-level rise planning areas

- Three current water levels plus 2030, 2050, and 2100 sea-level rise estimates



Photo Credit: Outlier Solutions, Inc., and LightHawk



Sea-level Rise Vulnerability Inventory

- Inventory assets within the planning areas
 - Potential categories: infrastructure, socioeconomics, natural resources
- Deliver inventory to county and local planners
- Any guidance/input welcome
 - Assets of concern
 - Data gaps
 - Data sources
 - Final product format
 - Map viewers, database, reports??



Julie Sepanik

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(503) 934-0035

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Oregon Estuary & Shorelands Habitat Project of Special Merit



CMECS Products

Phase II



Project Contact

Andy Lanier, Andy.Lanier@state.or.us, 503-934-0072



Phase II Activities

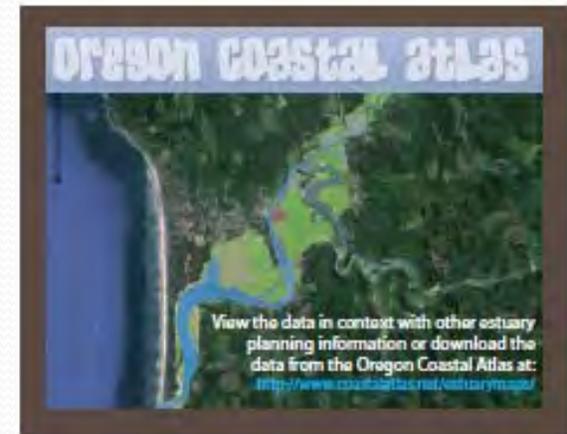
OCMP will work closely with key data stewards and partner agencies to incorporate specific high-value data sets into the existing first generation Oregon Estuaries CMECS data products:

- Biological Data
 - Shellfish: ODFW Marine Resources Program for integration of datasets generated by the Shellfish and Estuarine Assessment of Coastal Oregon (SEACOR);
 - South Slough National Estuarine Research Reserve for integration of data for the Coos Estuary Inventory data;
 - Tillamook Bay National Estuary Program for integration of tidal wetlands data; and
 - US EPA Pacific Coastal Ecology Lab for integration of detailed data to characterizing submerged aquatic vegetation and information about faunal communities.
- Site Specific Bathymetric Data
- Site Specific Estuary assessments:
 - Necanicum, Nehalem, Tillamook, Yaquina, Alsea, Siuslaw, and Umpqua estuaries conducted by the Estuary Technical Group, Institute for Applied Ecology and Green Point Consulting

Products will include updated CMECS component data layers, updated web applications, and new hard copy publications similar to the original Estuary Plan Book.

Phase I Resources:

- Download the data at:
<http://www.coastalatlasing.com>
- Browse the data on the Estuary Planning Viewer:
<http://www.coastalatlasing.com/estuaryviewer>
- Electronic Version of the Estuaries Summit Poster available at:
http://www.coastalatlasing.com/documents/cmecs/RAE_2014_Poster.pdf
- Dig into the methods at:
http://www.coastalatlasing.com/documents/cmecs/ESM_CoreGISMethods.pdf



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Oregon ShoreZone



Andy Lanier
Oregon Coastal Management Program
Andy.Lanier@state.or.us



Welcome to Oregon ShoreZone

Oregon ShoreZone is a project that builds upon several decades of previous work. There are existing ShoreZone projects covering the shorelines of [Alaska](#), British Columbia, and [Washington](#). The addition of Oregon to the ShoreZone family extends this valuable dataset from the Columbia River mouth down to the California border.

ShoreZone Images

Oblique low-altitude digital still imagery of the Oregon shorezone was collected to supplement ShoreZone video. Browse these image locations via an online map and link to full resolution downloads.

[Browse Photos](#)

ShoreZone Data

ShoreZone georeferenced aerial imagery is collected specifically for the interpretation and integration of geological and biological features of the intertidal zone and nearshore environment. This information is now available in an ESRI Geodatabase.

[Get Data](#)

ShoreZone Videos

Oblique low-altitude aerial video and digital still imagery of the Oregon coastal zone was collected during the lowest tides of the year in June 2011 from a helicopter flying at altitudes of 100-300m altitude. These videos are now available to stream online.

[Watch Videos](#)

<http://www.oregonshorezone.info>

Project Scope

- Initial Survey(2011)
 - 2,071 km of Oregon ocean and estuary shoreline photographed
- Shoreline Mapped (2014)
 - 95% of video imagery classified
- Video Application Developed (June 2015)
- Website Developed (Oct 2015)



Figure 2. Map of the study area in Oregon (2,633 km based on CUSP shoreline length)

A New ShoreZone Video App



Video Panel



Photo Panel



Map Panel



System Selection Menu

A Focus on the Video Imagery

- Videos can be played from two different sources to optimize playback (YouTube, Oregon Coastal Atlas)
- Named system segments are provided in the menu for ease of browsing the imagery (Littoral Cells, Rocky Shores, Estuaries, Communities).
- Adjacent systems are suggested to the N, S



The Photo Panel:

Access to the Photos (Full Resolution!)



The Map Panel:

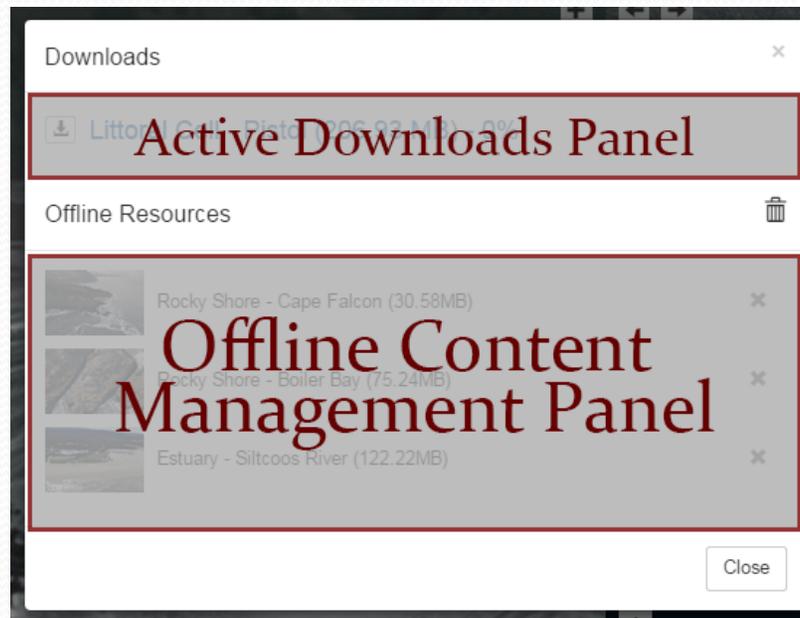
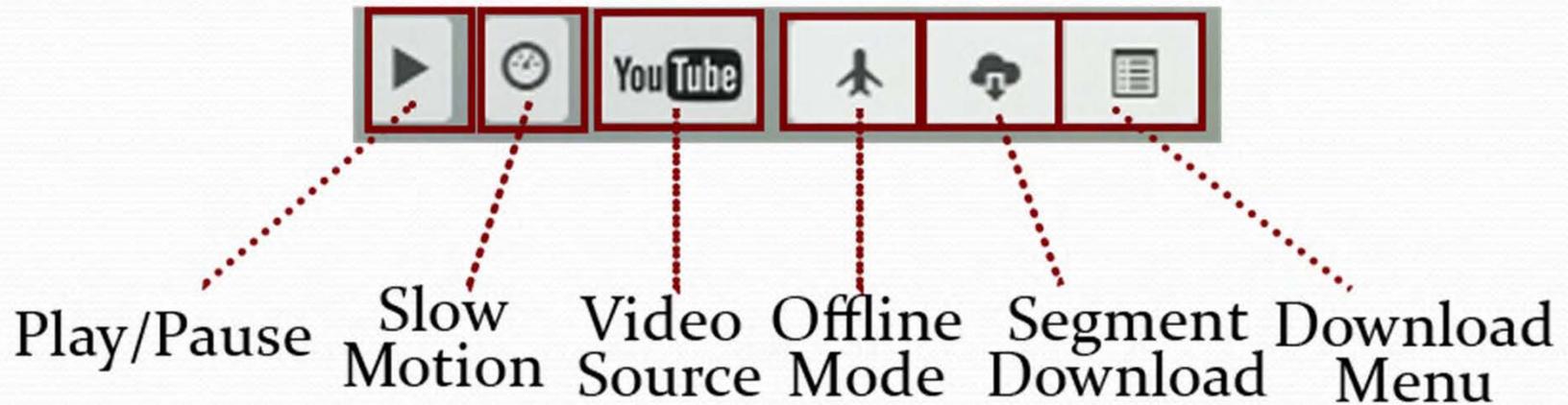
Easily navigate to areas of interest

The panel shows the extent of the ShoreZone segment selected for display while also enabling navigation to specific locations by moving the blue dot from its current location to the desired one (and then clicking play button on the video panel).

Basemap Toggle provided to switch between imagery and map background.



ShoreZone To Go - Offline Mode!



ShoreZone Acknowledgements

Project Partners

ODFW - Dave Fox

DLCD- Andy Lanier, Tanya Haddad

ShoreZone Contractors

Coastal and Ocean Resources - Dr. John Harper,

Coastal and Ocean Resources - Dr. Carl Schoch

Archipelago Marine Research - Mary Morris

Mapiworks - Mario Pilz

Funding

State of Oregon

Department of Fish and Wildlife

Department of Land Conservation and Development

Department of Administrative Services - Oregon

Geographic Information Council

NOAA Office of Ocean and Coastal Resource Management

USFWS State Wildlife Grants





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Coastal Hazard Planning Updates

Laren Woolley
Coastal Shores Specialist

- NOAA Coastal Resilience Grant Application
- Ongoing Tsunami Land Use Work
- Neskowin Coastal Erosion Adaptation Plan Update
- Potential for Winter Coastal Erosion - High!



NOAA Coastal Resilience Grant

- DOGAMI and DLCD applied for this grant

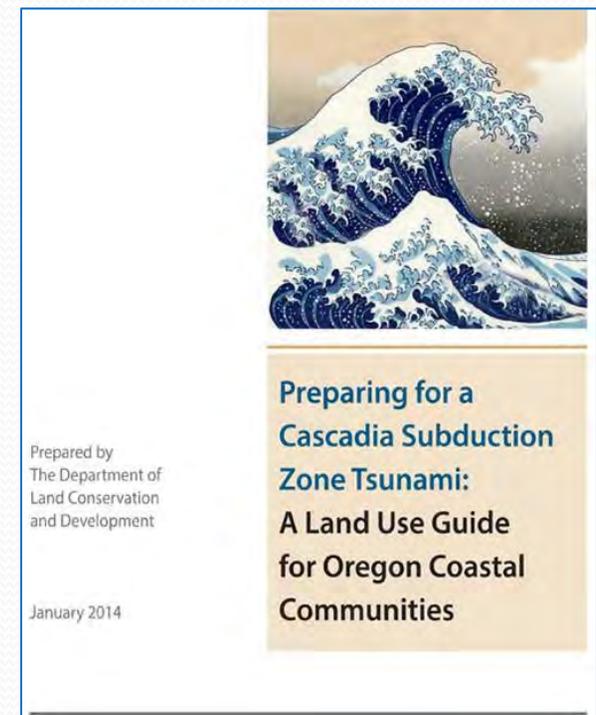
Proposal includes:

- DOGAMI Time and Distance Modeling for selected communities
 - \$\$\$\$ / support for tsunami land use work for a number of jurisdictions
- We should know something by the end of November
- The grant is very competitive
- We are also looking for additional / alternative resources for this work



Tsunami Land Use Work

- Tsunami Guide Update - More robust Chapter 6 completed this past Spring
 - Planned and anticipated
 - Detailed guidance on tsunami evacuation facilities improvement planning
 - Similar to a land use public facility plan
 - Necessary for development financing tools/land use code provisions to work
- Ongoing Work
 - Preliminary discussions - Numerous communities have engaged and want to move forward
 - More formal work:
 - Clatsop County
 - Coos County
 - Curry County
 - 11 jurisdictions have committed in writing to move forward, utilizing the DLCD guidance, when resources becomes available



Neskowin Coastal Erosion Adaptation Plan

- Tillamook County has adopted the amendments which include:
 - Comprehensive plan text, policies and maps
 - Development code provisions including:
 - New Overlay - "Neskowin Coastal Hazard Overlay Zone" with associated requirements
 - Erosion control and stormwater management provisions
- Amendments became final in August 2015
- Tillamook County and Neskowin community members did a great job

- Contact me for more information
- Possibly a panel on this effort in the Spring...

**The Neskowin Coastal Erosion
Adaptation Plan**
Completed August 2015



Tillamook County
Department of Community Development
1510 B Third Street, Tillamook, OR 97141
<http://www.co.tillamook.or.us/gov/ComDev/>

Development of this plan was supported through financial assistance provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

Potential for Winter Coastal Erosion - High!

- Super El Nino Potential
 - Setting up much like the 1997/98 "Super El Nino"
 - Pacific Northwest generally: Warmer temperatures, drought persisting
 - Oregon coast: Could receive a number of high energy storm systems which could cause significant erosion - similar to 1997/98
- Quick "Beachfront Protective Structure" Refresher
 - Goal 18 limits BPS eligibility to development that occurred prior to 1977
 - Local governments make official eligibility determination
 - OCMP developed a comprehensive inventory (Ocean Shores Data Viewer):
<http://coastalatlantlas.net/oceanshores>
- OPRD Contact Information:
Jay Sennewald
Ocean Shores Permit Coordinator
Email: jay.sennewald@oregon.gov
Phone: 541-563-8504



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Input on Spring Meeting Topics?

- Neskowin Adaptation Planning Panel
- Affordable Housing Panel
- Involvement of Academia in Planning Projects
- DOGAMI Time and Distance Modeling
- Tribal Panel
- DSL Wetland Notice Process

Questions?



Photograph by: Andy Lanier

Program Staff Contact Info:

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- Dave Perry, Dave.Perry@state.or.us, (541) 574 - 1584
- Julie Sepanik, Julie.Sepanik@state.or.us, (503) 934-0035
- Andy Lanier, Andy.Lanier@state.or.us, (503) 934 - 0072
- Laren Woolley, Laren.Woolley@state.or.us, (541) 574 - 0811



Attachment 306-9-A-2

Course Name: **Climate Adaptation for Coastal Communities**

Date: Oct. 6-8, 2015

Host: South Slough National Estuarine Research Reserve, Oregon Coastal Management Program, Oregon Disaster Resilience Partnership, Oregon Sea Grant

Host Email: john.bragg@state.or.us

First Name	Last Name	Email	Telephone	Organization	Which best describes your organization?	Mobile
Denise	Lofman	dlofman@columbiaestuary.org	503-325-0435 x218	CREST (Columbia River Estuary Study Taskforce)	NGO/Non-Profit	
Ryan	Crater	rcrater@columbiaestuary.org	503-325-0435 x213	CREST	NGO/Non-Profit	
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Mark	Nicholson	markn@lincolncity.org	541-921-5286	Lincoln City Emergency Preparedness	Local Government	
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John	Bragg	john.bragg@state.or.us	541-888-5558 ext. 129	South Slough NERR	National Estuarine Research Reserve	
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Kyle	Kerns	kyle.kearns@oregon.gov	503-842-4045	Business Oregon Infrastructure Finance Authority	State Agency	513-240-4393
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Patrick	Winguard			Dept. of Land Conservation and Development	State Agency	

Kyle Kearns | RARE Participant
 Business Oregon - Infrastructure Finance Authority
 2108 Fourth Street
 Tillamook, OR 97141

[503-842-4045 office](tel:503-842-4045)
[513-240-4593 mobile](tel:513-240-4593)

Oregon Fish and Wildlife Commission
Major Issues Report
Western Association of Fish and Wildlife Agencies
November 2015

MARINE RESOURCES PROGRAM (MRP)

MRP is responsible for ocean and estuarine (lower estuary) fish and wildlife management for the state, including both policy development and implementation. Updates below highlight activities by marine staff during the second half of 2015, including research, management activities, public input processes and community outreach.

Marine Fisheries - Jointly Managed

Federal Groundfish Management

The MRP represents Oregon's fisheries interests by participating in both the Pacific and North Pacific Fisheries Management Councils. The Councils are voting panels that in principle sets the seasons, quotas, and regulations for groundfish species based on the input from scientists, fishermen, and environmentalists.

Pacific Fishery Management Council (PFMC): Since the June 2015 update, ODFW staff worked with the PFMC to finalize regulations, quotas, and seasons for the 2015-2016 groundfish fisheries. The PFMC is charged with sustainably managing more than ninety different groundfish species, and allocating fish among multiple valuable fisheries – worth just shy of \$100 million per year, in combination. After each of the fisheries receives their allotment, the PFMC must assess and establish regulations and seasons for each group. Work continues on important commercial fishery items, such as electronic monitoring and actions following the implementation of the trawl rationalization program.

North Pacific Fishery Management Council (NPFMC): A large segment of Oregon's commercial fleet also participates in Alaskan federal fisheries each year. An MRP staff member sits on the Science and Statistical Committee for the NPFMC, which manages federal fisheries in the Bering Sea, Aleutian Islands (131 groundfish species), Gulf of Alaska (134 groundfish species) and the Arctic. ODFW staff worked with Oregon representatives on other committees and with Council members on various issues, upcoming groundfish rationalization in the Gulf of Alaska, annual crab and groundfish harvest specifications, fishery restrictions for ESA-listed species, and other regulatory actions.

Albacore Tuna

The commercial albacore fleet landed 7.4 million pounds in 2015 worth over \$9.0 million in ex-vessel revenue. Fishing success off Oregon was poor, especially for larger albacore (over 75 cm). Albacore abundance appeared to be greater in more northerly waters, possibly due to the widespread distribution of very warm waters off the Pacific Northwest. Total landings into Oregon were about 23% below the recent ten-year average while total ex-vessel revenue was about 25% below average.

The recreational fishery for albacore is very popular with about 11,100 angler trips during 2015, slightly lower than the recent five-year average of 12,000 angler trips per year. Angler success is high when albacore are abundant in areas within reach of the recreational fleet and ocean conditions are favorable. In 2015, fishery success was about average during July and August, but conditions worsened during September. As a result, anglers experienced a below average season, landing about 34,400 fish with an average catch rate of 3.1 fish per angler. Over the past five years, annual sport catches ranged from 21,577 to 63,167 albacore and averaged 40,000 per year. .

Coastal Pelagic Species

Since 2000, Astoria has been home port to a commercial purse seine fleet of about 25 vessels that targeted sardines, but also landed mackerels incidentally and small amounts of anchovies occasionally. In recent years,

sardine abundance off the west coast declined substantially to very low levels. As a result, federal harvest limits were reduced, and landings into Oregon recently fell by about 75%, from 40,000mt in 2012 to slightly over 9,800mt during the July 2014-June 15 season. Sardine prices rose so that ex-vessel revenues dropped by about half, from \$8.4 million in 2012 to \$4.3 million for the 2014-2015 season. As sardine harvest limits were reduced, the number of active vessels in the commercial fleet fell and a few vessels began targeting mackerels and anchovy. During the 2014-2015 season, purse seiners landed 1,200mt of Pacific mackerel and nearly 600mt of jack mackerel. Since June 2015, purse seiners have landed about 355mt of anchovies. For the 2015-16 season, directed fishing for sardines by the purse seine fleet is prohibited.

Sport Pacific Halibut

Oregon supports a sustainable, productive and popular Pacific halibut fishery. There is no greater long-term success story than Pacific halibut, which has been managed sustainably since the 1920s through a cooperative management program between the United States and Canada.

The 2015 quota, set by the International Pacific Halibut Commission for Oregon, Washington and California, was 1.0 percent lower than 2014. Halibut seasons opened in May, with most concluding in August, though some continue until the end of October. Based on input from anglers, beginning in 2014, the Central Oregon Coast nearshore fishery start date was moved to July 1. The later start date is intended to allow for more halibut opportunities later in the summer. Beginning in 2014 and continuing in 2015, the area between Humbug Mountain and the Oregon/California border (ports of Gold Beach and Brookings) is a new subarea with its own quota. The quota for this subarea was similar in 2015 to 2014, and the season is anticipated to be similar.



Angler filling out her tag after successfully landing a Pacific halibut

Sport Groundfish (rockfish, lingcod, flatfish, and others)

The sport groundfish fishery is currently the backbone of Oregon's ocean sport fisheries. It is the largest fishery in both catch and angler activity in most recent years. Some years it is larger than all the other saltwater fisheries combined (e.g., 2008 and 2011). The sport groundfish fishery is the most stable and reliable fishery, as opposed to the salmon and tuna fisheries that have boom-and-bust cycles. The importance of this fishery is most clearly seen in the distribution of the charter industry; only ports with groundfish reefs (and thus fisheries) are able to sustain charter boat businesses. Due to changes in federal allocations and regulations, there are some changes to retention regulations for some rockfish species. Beginning in 2015 China, copper, and quillback rockfish are prohibited, and there is a three fish sub-bag limit for blue rockfish (both varieties combined). On a more positive note, anglers are now able to keep one canary rockfish. Canary rockfish had been prohibited since 2004.



A canary rockfish

Angler activity during the winter months in recent years has been increasing, with 2015 having the highest effort in the last ten years. This pulse of angler spending during the tourism offseason has been beneficial to coastal economies. The value of tourism to coastal economies is important, since the only other primary revenue stream of note is other natural resource extraction.

MRP continues to promote the successful “No Floaters – Release at Depth” public outreach campaign, which includes providing free descender devices for anglers to use at sea, to help them increase the survivability of catch and release rockfish species (of concern). Through partnerships with angler groups, a zoo, and the Pacific States Marine Fisheries Commission, and a variety of grants over the last five years, MRP has been able to purchase and distribute over 12,000 descending devices to anglers and charter captains. This combined with the outreach campaign has more than doubled the rate of usage of descending devices.



Rockfish recompression/descending device logo being used to “brand” outreach activities and one type of descending device distributed.

Commercial Nearshore Fishery

The commercial nearshore fishery targets black rockfish, blue rockfish, and several other nearshore species including other nearshore rockfish (primarily China rockfish, quillback rockfish, and copper rockfish), cabezon, and greenlings. Although these species are part of the federal Pacific Coast Groundfish Fishery Management Plan, this fishery takes place primarily in state waters and is managed by the state through a limited-entry permit program.

Stock assessments for three nearshore species including black rockfish, China rockfish and kelp greenling were completed this summer and have been adopted by PFMC to set harvest for the 2017-2018 cycle. Several ODFW staff played key roles in each of these assessments, in collaboration with the lead federal stock assessors, to help with interpretation and use of biological and fishery data that were included. ODFW plans to continue close coordination with federal counterparts on future stock assessments, in order to maximize both the sustainability and harvest of these species along our coast.

Commercial Finfish Sampling

The Commercial Finfish Sampling project collects information on commercial groundfish and albacore tuna fisheries, including catch composition and biological data such as size, sex, reproductive maturity and age structures. These staff, stationed across the Oregon coast, provide an invaluable communication conduit with

the commercial fishing industry. As time allows, they also conduct and assist with fishery research projects, which provide additional information that is not traditionally available from fisheries but that helps support fisheries management.

During the reporting period, biologists worked with the nearshore fleet to educate industry members on potential curtailments of commercially important species, including kelp greenling, due to changes in stock accounting methods. Significant public comment was generated, motivating the PFMC's Scientific and Statistical Committee to re-examine the kelp greenling stock assessments. The result was a determination that the assessments were not viable and no change to management or harvest levels were warranted in 2015 or 2016. This is one example of public input greatly altering the management or policy decision making. For landings in commercial fisheries in Oregon, see this website here:

<http://www.dfw.state.or.us/fish/commercial/>

Recreational fisheries sampling

The Marine Resources Program operates a recreational ocean fishery sampling project (Ocean Recreational Boat Survey or ORBS) that is stratified by port, boat type (pleasure boat and charter boat), and sampling period. ORBS operates March through October at the five major fishing ports of Garibaldi, Depoe Bay, Newport, Charleston and Brookings, and at the ports of Astoria/Warrenton/Hammond, Pacific City, Florence, Winchester Bay, Bandon, and Gold Beach for typically 3.5 or five months. During these months, ORBS makes estimates of fishing effort and catch on a weekly basis. Harvest estimation at this detailed level is especially important for quota monitoring during the late spring and summer Pacific halibut, coho salmon, and Chinook salmon ocean seasons. Additional over-winter (November through February) sampling also regularly occurs at the ports of Depoe Bay, Newport, and Brookings and is reported on a monthly basis. For effort and catch estimates, see these webpages:

<http://www.dfw.state.or.us/MRP/salmon/catchindex.asp>,

<http://www.dfw.state.or.us/MRP/finfish/halibut/estimates/halcatch2014.asp> and

http://www.dfw.state.or.us/MRP/finfish/groundfish_sport/estimates.asp.

Marine Fisheries - State-Managed

In January 2015 MRP presented a Marine Fishery Management Plan Framework to the Oregon Fish and Wildlife Commission. This Framework was drafted under the umbrella of Oregon's Native Fish Conservation Policy to provide resource managers with a consistent approach for designing fishery management plans for Oregon's marine and estuarine fishery resources. It sets the structure for the components for plans and identifies a number of the important considerations and challenges that managers should take into account. The Oregon Marine Fisheries Management Plan Framework can be found at:

http://www.dfw.state.or.us/MRP/publications/docs/MFMP%20Framework_01-09-15.pdf. Over the summer and fall of 2015, ODFW has begun developing the first FMP developed under this new framework – the Forage Fish Management Plan. This plan is intended to have protections in state waters that mirror federal actions to protect forage fish from new fishing pressure, without careful review by federal and state managers. This action is a positive step toward ecosystem-based management of the West Coast fisheries.

Commercial Dungeness Crab

The 2014-15 Oregon Commercial Dungeness crab season closed as scheduled in mid-August, after a low-moderate season in landings but normal season in ex-vessel value. The twenty-year average for total annual landings is 16.3 million pounds. The average price per pound for the entire season is currently \$4.10, the highest average price in the history of the fishery. This is the second year that ODFW has run a derelict crab gear retrieval program and the second year of success, both in terms of derelict pots collected and a smooth and orderly permitted pot retrieval program.

Commercial Pink Shrimp

The Oregon shrimp fishery landed over 51 million lbs in 2015 with good catch rates for most of the season and a strong ex-vessel price averaging about \$0.75/lb. Reports from fishers suggest that bycatch of eulachon, a threatened species, was greatly reduced by a new, highly effective technology pioneered by ODFW

and PSMFC using green artificial LED lights attached to the trawl footrope. The small residual eulachon bycatches that shrimpers are seeing suggest a continued high marine abundance of eulachon.



Comparison showing the effect that green LED lights on the trawl footrope have on shrimp fishery bycatch.

Recreational Crab and Clam Fisheries

ODFW MRP staff members continue to conduct shoreline surveys to monitor the levels of sport harvest for Dungeness crab, red rock crab, razor clams, and several species of bay clams. Data from these creel surveys and interviews with crabbers and clambers are coupled with counts of the sport harvesters in the bays, estuaries, and along the beaches to develop estimates of the overall effort expended by the recreational shellfishers. Staff members also collect measurements of the biological characteristics of the clams and crab (species, size, abundance, condition, etc.). Information generated by the monitoring work is used to gauge the level of seasonal harvest activity and periodically evaluate the need for any modifications of the shellfish harvest regulations.

Research, Assessment, Resource Inventory

Marine Habitat

Marine Habitat Project staff conducted underwater video surveys using a remotely operated vehicle, as part of an assessment of the distribution and ecological role of benthic invertebrates that create biogenic habitat in Oregon's nearshore marine waters. This phase of the study is focusing on methods development, particularly the utility of downward-looking video and still cameras for quantifying invertebrates. The surveys add to baseline ecological assessments for Cascade Head and Cape Perpetua Marine Reserves, in addition to incorporating deeper rocky reefs at Stonewall Banks.

Marine Habitat staff also participated in various policy and resource management efforts, primarily the Pacific Fishery Management Council (PFMC) Habitat Committee, providing Oregon's perspective and recommendations on a number of marine and freshwater habitat issues that affect PFMC-managed species.

Nearshore

The Nearshore Project staff began an investigation of the use of the video lander tool for assessing populations of fishes on rocky reefs within the three nautical mile territorial sea. Work was done in collaboration with the Marine Reserves program by sharing data and analysis. This initial work focused on evaluating how best to utilize this tool. Specifically, one initial objective included examining the time of first arrival for the various fishes encountered, and the time when the maximum number of any given species was observed. The goal was to examine if any species exhibited either an attraction to or avoidance of the video lander and also to help determine the optimal time for deploying the lander to capture the diversity of species present. Additional objectives of this work included determining species-habitat associations and examining if the tool can be used to provide an index of abundance for fishery independent surveys.

The Nearshore Project also completed the ten-year revision of the Oregon Nearshore Strategy, an integral part of the agency's Oregon Conservation Strategy. The revised Strategy has been approved by the Oregon Fish and Wildlife Commission and submitted to the US Fish and Wildlife Service for approval (which is expected during the first half of 2016). More information on the revision and changes in the 10-year revision may be found at:

<http://www.dfw.state.or.us/MRP/nearshore/index.asp>

Fisheries Research

Several research projects led by MRP teams studied the nearshore environment and its inhabitants. Research continues to develop tools for surveying rocky reef fish populations including a study aimed at quantifying the area surveyed by a stereo-video lander as a function of seafloor water clarity and other variables. Work is also underway to implement stereo-video, for obtaining fish lengths and area viewed, on other visual survey platforms. Other research is evaluating the effects of capture-related barotrauma on yelloweye rockfish. A new Informational Report detailing life history characteristics was developed for redbanded rockfish, *Sebastes babcocki*. Copies of this report can be downloaded at

<http://www.dfw.state.or.us/MRP/publications/#Research>.



Video lander images showing the wide variation in water clarity that can be encountered on Oregon's rocky reefs.

Marine Mammals

The major functions of the Marine Mammal Program include: monitoring the status of seals and sea lions (pinnipeds) in Oregon; conducting studies of pinniped population biology; examining pinniped interactions with marine and anadromous fishes; and providing information on these issues to government entities and the general public.

Major activities for the past six months included completing annual field work at Willamette Falls on the Willamette River and Bonneville Dam on the Columbia River, sites where California sea lions and Steller sea lions aggregate each spring to consume listed salmonid stocks. Research at Willamette Falls showed that California sea lions consumed approximately 3,700 salmon and steelhead from March to June. Management at Bonneville Dam resulted in the removal of fifteen California sea lions and the marking of an additional 21 animals. Staff also conducted coast-wide aerial photographic surveys of harbor seals in May and June, and Steller sea lions in July. A preliminary estimate of the harbor seal population in Oregon was 11,500 seals. Other program activities included: capturing and marking California sea lions in Astoria; participation in the Northwest Marine Mammal Stranding Network planning for 2015 field work at Willamette Falls and Bonneville Dam; analysis of pinniped fecal samples to determine diet; and work on an online map of harbor seal haul-outs in Oregon.



A California sea lion foraging for salmonids below Willamette Falls near Oregon City

Razor Clam Population Surveys

Surveys of sport and commercial razor clam harvesters are routinely conducted during low tides along the Clatsop Beaches (north Oregon coast) to assess the levels of harvest effort and characteristics of the catch. The surveys include interviews with the clambers to determine catch per-unit-effort as well as measurements of the biological condition and size of the razor clams. Additional sampling occurs within processing plants to record the dates, sites, and levels of commercial razor clam landings. Determinations of clam body mass indices and spawning times are completed throughout the spring and summer seasons, and samples of the razor clam tissues are routinely tested for potential biotoxins by the Oregon Department of Agriculture / Food Safety Program. ODFW conducts a summer seasonal conservation closure from July 15 to September 30 of each year. The summer closure is designed as a pro-active management measure to protect the smaller juvenile razor clams during their critical period of growth. During the summer conservation closure, MRP staff conduct stock assessment surveys along the eighteen mile section of beach located between the Columbia River south jetty and Tillamook Head. Information is collected about the distribution, abundance, and sizes of all razor clams encountered during the systematic surveys. In 2014, the summer survey revealed that about sixteen million razor clams inhabit the eighteen mile stretch of beach. This is the highest number of razor clams observed since ODFW began conducting the population assessments, and their abundance is significantly greater than the previous peak of nine million clams observed in 2005. The average size of clams was a little over 2 ½ inches, and only a few larger than four inches were found. Razor clams were distributed fairly evenly along the entire stretch of beach.

Harmful algal blooms were a significant problem along the West Coast this summer, causing health advisories, fishery closures and delays in both molluscan and crustacean shellfish fisheries.

Shellfish and Estuarine Habitat Assessments (SEACOR)

SEACOR completed a two-year study (2013-2014) of shellfish populations and estuarine habitats of Netarts Bay. Clam distribution maps and brochures were updated and published online for Netarts Bay, Tillamook Bay, and Yaquina Bay. Data from SEACOR studies will be used by the Shellfish Program to better manage the commercial and recreational clam fisheries and track changes in clam populations and estuarine habitats. The focus has now shifted to the central Oregon coast, and staff conducted similar studies in Alsea and Siletz Bays. Visit our recently updated website for reports, clam maps, and other information produced by the SEACOR project at <http://www.dfw.state.or.us/mrp/shellfish/seacor/>



SEACOR biologists measure the densities of eelgrass and bay clams.

Marine Reserves

In Oregon, marine reserves are areas in coastal waters dedicated to conservation and scientific research. In 2012, Oregon completed designation of five marine reserve sites. All removal of marine life is prohibited in these areas, as is ocean development. ODFW is responsible for overseeing the management and scientific monitoring of Oregon's system of five marine reserve sites. The Department's Marine Reserves Program is housed at the coast in Newport, Oregon and has six staff. The program is responsible for scientific monitoring, developing and implementing site management plans, providing information to the public, engaging communities in marine reserves implementation, and coordinating enforcement with Oregon State Police.

Honing of Sampling Methods – Trifecta Study

Oregon's five marine reserve sites host a variety of nearshore marine habitats and species. ODFW staff use a suite of sampling tools to monitor habitats and species over time. Different habitats require different sampling tools and certain tools are better at sampling certain species or capturing certain measurements. To better understand the sampling biases of the tools being used to assess shallow rocky reef areas of marine reserve sites, we conducted a pilot "Trifecta Study". The Trifecta Study entailed conducting concurrent surveys, using three different sampling tools to see if they produce similar measures of fish abundance and species composition. The study was conducted last year at the Redfish Rocks Marine Reserve and looked at the differences between hook-and-line, SCUBA, and video lander sampling tools. Preliminary results indicated that the video lander was slightly less effective than the other tools, although results were not statistically significant. The video lander did not provide for visual identification of all fish down to the species level, which reduces the apparent species richness (number of different species recorded). Also, hook-and-line surveys were able to capture less common species of rockfishes including China and Quillback Rockfish. We will be repeating this study, to continue to hone in on the best methods to use to answer specific research questions.



Oregon Marine Reserves: There's more beneath the surface.

Telling Oregon's Coastal Story – Human Dimensions Scientific Research

ODFW is working in collaboration with a variety of research partners to study the human dimensions of implementing Oregon's marine reserves. We are exploring what happens over time to communities, social groups, and individuals when we implement a marine reserve site (i.e. cease fishing in a known area). Our research partners include social scientists at universities and in the private sector. They provide advice, lend different expertise, and help us round out our monitoring program. With the help of our partners, we have eleven human dimensions studies underway this year. These studies span multiple social science disciplines (e.g. sociology, anthropology, economics) and are collecting data and information on how communities, ocean users, and regional economies are affected as well as interactions between the economy, marine environment, and communities.

Visit the website: For more information please visit the state's Oregon Marine Reserves website at www.oregonocean.info/marinereserves.

Marine Resource Management

Marine Spatial Planning

MRP staff continued work on two processes for siting alternative ocean energy developments in federal waters. The first involves a federal planning process through the Bureau of Ocean Energy Management (BOEM) task force. The second involves an effort headed by Department of Land Conservation and Development (DLCDD) to develop a Geographic Location Description (GLD) under provisions of the Coastal Zone Management Act.

A GLD will allow the state to review certain federal permit and license activities in a defined area of Federal waters for consistency with the state's enforceable policies within their Coastal Zone Management Program. MRP's role in these processes centers on providing marine ecological data and associated policy recommendations for a document that will be used to justify the need for the GLD to the National Oceanic Atmospheric Association (NOAA). NOAA is considering the GLD for adoption.

Education and Outreach Events

MRP staff members regularly participate in a variety of public education and outreach events. Over the past six months, recent outreach events include the Saltwater Anglers Show (February 28 – March 1, Salem), Career Day (April 8, Newport), Hatfield Marine Science Center / Marine Science Day (April 11, Newport), Free Public Clam Clinic (April 22, Newport), Netarts Clam Clinic (May 23, Netarts), and several Family Clamming and Crabbing Workshops (April – August, Coos Bay).

Family crabbing and clamming workshops are very popular along the southern Oregon coast. The free workshops are generally offered once monthly April through August out of the ODFW office in Charleston. Shellfish Program staff also delivered seminars, lectures at professional meetings, and workshop presentations on a variety of topics and issues over the winter and spring, and have more planned for the future.



Shellfish biologists introduce young crabbers to the proper way to handle live crab.

Using Online Tools to Increase Public Input

In the last six months Sport Groundfish and Halibut staff have reached out to the public during a series of public meetings (ODFW's standard method for getting public input), to help set-up the 2016 sport halibut seasons and get input on the 2017-2018 sport groundfish seasons. Staff have begun to webcast at least one public meeting in each series, so that anglers who may not be able to attend in person can still hear the discussions and provide input. In addition to the public meetings, online surveys have been used for a couple years to get input from anglers who are unable to attend meetings in person. The surveys are beneficial in getting input from a wider distribution of anglers; however, the interaction between fisheries managers and resource users, and amongst anglers is missed. MRP plans to use online surveys in a number of ways to facilitate public input, which is critical for our management practices.

Public Meetings and Advisory Groups

The MRP values public input on the development of and changes to fishery regulations, season structure and other resource management issues. During the reporting period, we held a number of public meetings across the coast, convened advisory groups, and provided online survey opportunities (described above) for public input:

- Commercial Nearshore public meetings
- Sport Halibut public meetings, online survey
- Sportfishing Advisory Committee
- Commercial Nearshore Advisory Committee, one joint meeting, one meeting of each individually