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Public comment for: Federal disapproval of Oregon's coastal area pollution program

[redacted]

Fri, Dec 20, 2013 at 7:19 PM

To: joelle.gore@noaa.gov

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Joelle,

Thank you for the opportunity to comment on EPA and NOAA disapproval of Oregon's coastal area pollution program. I have been working with the Oregon Plan salmon recovery process for many years in many partnership collaborations. I have now come to the reluctant conclusion that the Oregon state legislature is obstructing the salmon recovery process, and will not sufficiently enable the state agencies to do the needed pointedly investigative water quality monitoring to adequately support CZARA non point source water impairment improvement goals. We may not have all of the funding to adequately accomplish water quality assessment and improvement, but the state won't even allow major water impairment issues to be placed on the 'prioritization table' so that we can become more scientifically and fiscally responsible in our salmon recovery effort. This political bias to obstruct, has placed a fatal flaw into all of the good work that has thus far been accomplished within the salmon habitat restoration paradigm.

A very impressive amount of work has been done, yet it now becomes necessary to include toxic contaminant impairment assessment for non point sources, which cannot be done under the current politic.

I will attach two files describing major water quality impairment issues that the state strongly resists working on, or even placing onto the prioritization table. I am in hopes that disapproval does begin to alter this adverse dynamic by the state, and begin making toxics reduction a real possibility.

[redacted]

2 attachments

WQ prob intro.docx
37K

Something Wrong.docx
48K

Siuslaw watershed, mid coast Oregon

Introduction to impaired waters problem:

We have very good quality water in general, and we have a lot of it in mid coast watersheds. However, there is very low availability of exchangeable calcium carbonate to buffer acidification events, compared to waters in most of the rest of the nation. Common water hardness range is 8 to 24 mg/l CaCO3.

This low CaCO3 level appears to be getting worse than in the prehistoric conditions that the stream organisms had become adapted to.

Low calcium waters are at much higher risk of increased frequency and severity of acidification pressures causing episodically lower pH and exchangeable CaCO3 dips.

These low-calcium events tend to push stream organisms outside of their preference range for calcium availability, placing them at higher risk of pathogenic hypocalcemia.

This causes assemblage shifts in stream populations, altering the ecology. This may relate to proposed biocriteria listings for macroinvertebrate assemblage shifts (as seen in PREDATOR data for the Siuslaw).

Many acidification pressures are anthropogenic:

- Reduced marine-derived nutrient CaCO3 from reduction of spawning salmon and lamprey returns.
- Atmospheric CO2 increase
- Red alder percent vegetation cover increase, while red cedar cover has been greatly reduced.
- pH and CaCO3 dips mobilize calcium utilization-inhibiting metals increasing pathogenicity.
- This anthropogenic pathogenicity alters salmon ecology, causing reduced salmon-supportive species.
- Low calcium events increase corrosivity of stream waters to metals.
- Non point pollutant sources of toxic metals increase pathogenicity to salmon.
- The toxic metal lead is an anthropogenic threat to salmon in low calcium waters.

We have several major sources of toxic lead that pollute our salmon streams in the Siuslaw and other low calcium high risk watersheds.

- Leaded gasoline was a major source that is now greatly improved.

- Dissolution of huge quantities of lost lead fishing sinkers, boat anchors, and bullets is a major ongoing source. They get ground up in the mortar and pestle action of riverine potholes to exponentially increase surface area exposed to low calcium waters, and fine particulate can contact sensitive gill and gut tissues.

- Seven heavily degraded railroad bridges on the Siuslaw River pollute waters with huge quantities of toxic lead and other toxic metals via leaching and fine particulate flakes flushing to pollute high priority salmon habitat. A single stream of water running off of one of the bridges was contaminated with sixteen thousand times the water quality criterion, one rivulet off of one bridge.

- Dissolution of metals from culverts contributes to pollution of high priority cool water refuge for salmon and supportive species.

- pH dip severity and frequency episodically increases potential for toxic aluminum mobilization from soils and from anthropogenic sources in the streams.

- Legacy lead and copper birdshot, littering the estuary mud, adds to the toxic metal pollutant sourcing and pathology when copious leaching rains run off of contaminated bay mud at low tide.

Toxic metal pathogenicity is a generally ignored limiting factor for salmon population recovery in mid coast low calcium watersheds.

- This non point source metals threat does not show up in 303d listings by any state or federal agency responsible for water quality assessment and salmon population recovery effort. Regulatory agencies studiously ignore any suggestion of water quality impairment from these sources because of fear of censure from the state legislature.

- This omission is scientifically, ecologically, and fiscally irresponsible while we do not prioritize for adequate monitoring, assessment, and mitigation of these threats. We have a great opportunity, to save us a lot of money, if we identify and clean up some of these sources that impair beneficial uses of our waters, the political bias is based on short term avoidance to the detriment of long term gains.

- We must reduce toxic metal inputs to these low calcium high risk waters.

- We must reduce anthropogenic freshwater acidification pressures, yet we don't even place them anywhere on the prioritization 'table' to be considered. Something is wrong. Scientific and fiscal responsibility for sustaining our future is being stymied by an unsupportive state legislature.

- Monitoring funding for these ignored limiting factors is effectively held back by water quality responsible agencies because such pointedly investigative assessment is seen as inherently politically subversive because the agencies are inadequately supported by

the state legislature and the Environmental Quality Commission to do pointedly investigative toxic pollutant assessment on a site-specific basis.

- We cannot claim 'best available science' as a basis for our salmon recovery effort while this paradigm blocks our toxic pollutant assessment as it applies to salmon recovery, aquatic health, and human health in the low calcium high risk waters of the mid coast.

- The Oregon Department of Environmental Quality needs to be enabled by the legislature and EQC to fulfill its purpose in protection of all residents from environmental toxic contaminants.

- The current IRTMDL process will not adequately define mid coast water quality status and trends, since it ignores low calcium associated pollutant risks to aquatic health in mid coast waters.

- Additional state and federal assessment is essential to salmon recovery effort and aquatic health attainment to support all beneficial uses in these watersheds.

- The ecosystem service values, provided by clean water, far outweigh the costs of monitoring in a true cost/benefit assessment. We could save vast amounts of money if we placed these water quality issues directly onto the 'prioritization table' rather than sticking our heads in the sand while pretending they do not exist. A large body of scientific literature supports pointedly investigative assessment of these non point source pollution issues.

The enclosed opinion papers attempt to clarify the need for addressing prioritization of these non point pollutant sources that impair our mid coast aquatic health and beneficial uses of our waters. The papers have a lot of redundancies, since they were reports for projects with different goals, funded from different sources, or unfunded volunteer work.

Most of the water chemistry data that drives these concerns was collected from 1994 to 2004. A targeted project, the Lake Creek Lead Assessment Project (LCPbA), was done in response to initial Siuslaw Soil and Water Conservation District water sampling that indicated concern that dissolved and total recoverable lead levels appeared to be elevated frequently in the lower part of Lake Creek which is the major tributary to the Siuslaw River. This study concentrated on a mile long stream segment a couple of miles above the confluence with the Siuslaw. Data from the project suggested that indeed there were frequent elevated lead levels in the water. SWCD work in '98 and '99 included continued effort to get ODEQ to come down to sample some of the water using their own methodologies to clarify if there was a level of concern on their part. An account of this effort is included in the enclosed papers.

Increased concern by the SWCD and the Watershed Council led to inclusion of a follow-up study to the LCPbA study with EPA funding for the Siuslaw Watershed Restoration Initiative through Ecotrust and the Siuslaw Watershed Council. This project was the Siuslaw River Mussel Study (SRMS). The study focused on the declining health and populations of freshwater mussels within the stream segments that had shown elevated lead levels in previous studies.
The SRMS study indicated concern that mussel populations were very likely being adversely affected by the nonpoint source issues of concern that now included elevated lead pollution from seven badly degrading railroad bridges that are leaching huge quantities of lead contaminated paint into the Siuslaw mainstem below the LCPbA study segment. This discovery added greatly to our concern for water impairment from lead sources and associated freshwater acidification pressures locally.

In addition to the electronic versions of the main studies conducted so far, I have included opinion papers of concerns of perceived apparent ODEQ methodology insufficiency in assessment of hardness dependent metals data through the years, which appear to be continuing to the present. If these concerns prove to have merit, it would bring into question the accuracy of 303d determinations for Clean Water Act listings of impaired waters in the State of Oregon for hardness-dependent toxic metals in low hardness waters that are sensitive for listed species.

The current IR-TMDL process will not include any of these water quality concerns adequately. One of our concerns is that the current IR-TMDL not be seen as the definitive water quality assessment to guide future funding prioritization in mid coast watersheds, because such important nonpoint source issues for hardness dependent metals have not been included to date, and appear to us to be essential to assess as soon as possible, if we hope to claim 'best available science' for our work for aquatic health and salmon recovery in these watersheds.

We may not have enough money available currently to deal with all of the contaminant issues we have identified, but we must insist on having enough scientific and fiscal integrity to be able to place all issues squarely onto the prioritization 'table'. As natural resource managers, we need to face the water quality reality in the field. We are not playing with a full deck of cards if politics prevents adequate collection and assessment of data on these issues. To the degree that water quality criteria and standards are not correctly applied for hardness-dependency of identified nonpoint pollutant metals, resource management fiscal and scientific integrity becomes misinformed and more subject to prioritization errors, with subsequent lost opportunity for aquatic health improvement in a cost effective manner. Salmon, lamprey, river mussels, and supportive species continue to decline. We have to question ourselves, and we have to question authority if we hope to be effective in time.

Quality Water, Quality Life

Water quality perspectives in the Siuslaw watershed

On the mid coast Oregon salmon streams I live on, the rainy season has begun again. Rains drench the forest, the clearcuts, the roads, and the railroad bridges. Copious rainfall flows over and through all of these surfaces and into the streams of the salmon.

The prehistoric salmon habitat had long supported massive salmon and supportive species populations. Historic habitat degradations have greatly reduced aquatic health and salmon returns. Many local residents are working very hard, at great personal cost, to improve salmon habitat and aquatic health. Long hours of unpaid work are logged by thousands of volunteers working alongside of paid professionals. Together, we have done more than I had thought possible. We are encouraged, and challenged, to improve our effectiveness.

Our effectiveness is dependent on the quality of the questions we ask. Science advances by evaluating evidence and improving the quality of questions. Dedication to a scientifically questioning attitude leads more effectively toward salmon recovery. Facing difficult questions is at the heart of our work. Many millions of dollars are spent on the recovery effort. It is fiscally, and ethically, irresponsible to neglect to ask the tough questions that environmental investigation suggests during our work. This public opinion paper attempts to address this responsibility.

Species are going extinct at an alarming rate. Aquatic species are declining about five times faster than terrestrial species. We work under great pressure for timely aquatic health improvement, or the beauty we have known will not be adequately passed to our great grandchildren. There is a need to improve the quality of our questions quickly. We need it as a top priority as our biggest challenge in salmon recovery effort. If we sit in our meetings and work in the field while we avoid asking the tough questions, we will not be in time. This opinion paper respectfully offers to bite the existential bullet toward advancing the quality of our questioning in a timely fashion. Mistakes are inevitable but our understanding needs to advance more quickly, and will, if we cultivate a questioning attitude in our work. The resultant surge in creativity will carry us through to expand our understanding and adaptive effectiveness with better scientific integrity.

Pointedly investigative water quality monitoring and assessment is inherently politically subversive, yet it is absolutely essential for aquatic health and salmon population recovery.

National politics pressures EPA and NOAA to avoid any meaningful environmental assessment of the toxic metal lead as a contaminant pollutant in our mountains and salmon streams for fear of political power from the National Rifle Association and industry. The NRA actively seeks legislation barring the agencies from pointed environmental investigation of lead. The NRA is a huge lobby and carries a lot of political clout. The politic biases the agencies responsible for water quality assessment toward ignoring the wealth of toxicologic science that implicates toxic effects of lead as another limiting factor for salmon population recovery in high risk watersheds of the Pacific coast.

Almost everyone in these agencies came out of college with a desire to help better our world with quality environmental assessment, scientific integrity, and water quality improvement. Agencies are staffed with best-intentioned people, yet the political arms of each agency are cowed under the national political pressures from the NRA, mining, and military/industrial anti-investigatory lobbies. National politics bows to this environmentally misdirected power. Pointedly investigative environmental assessment is therefore now inherently politically subversive. Agencies dare not fund needed assessment enough to make any ‘waves that could swamp the agency

boat' lest funding could be punitively cut for other work that they are still able to get done for the environment. This anti-investigatory paradigm is a huge blocking boulder in the stream of salmon recovery effort to provide supportive aquatic health. State environmental quality departments need state legislative support to enable scientifically responsible ecologic water quality assessment for aquatic health and salmon recovery. The state must take a stand for the health of all residents and for the beauty we have the responsibility of passing to our great-great-grandchildren. Fiscal responsibility should require scientific integrity that cannot be obtained without water quality monitoring integrity to the best of our ability. "Best available science" claims for our current salmon habitat restoration cannot legitimately be made without freedom to investigate adequately.

Any freshwater aquatic health assessment work for salmon recovery should strive to keep in mind that we are desperately trying to clarify what the aquatic reality actually is, from moment to moment, for organisms in rivers and streams. Changes we cause in water quality all affect their ability to thrive. The more changes we introduce, the more pressures we put on them to adapt to those changes quickly enough to avoid decline. Their plasticity and resiliency is challenged by the accumulative pressures to adapt. Decline pressures have been accumulating faster than the ability to adapt adequately evolves. It's impossible to fully grasp the environmental complexity they face, but our success depends on our clarity of understanding.

We have a very poor understanding of pollutant effects (what we do know is alarming), yet they are pervasive throughout the salmon life cycle. As natural resource managers, we desperately need more clarity and increasing ability to detect, understand toxicologic implications, and to reduce toxic degradations of aquatic health. Adequate monitoring is essential to understanding pollutant impacts. **Monitoring costs, however, all of the beneficial values of the totality of ecosystem services provided by aquatic health far outweigh costs of monitoring.** Any accurate comprehensive cost/benefit analysis would demonstrate the essential nature of the economics of water quality monitoring. We cannot hope to adequately do our work without greatly increased monitoring that will provide the clarity to adaptive water quality and aquatic health improvement for the salmon and other ecosystem services.

Yet, the natural resources management imperative for monitoring remains under illogical attack from the industrial/military politic that creates the novel chemicals fueling our carcinomorphic rush to consume our world with uncontrolled growth. Aquatic monitoring is seen as antagonistic to this cancerous growth paradigm. Adequate monitoring is reduced by the politic that supports this carcinogenicity. In biology/ecology, growth has to be paid for, aberrant growth becomes too costly and the system self-regulates, reducing carcinogenic pressure. Society is illogically becoming more antagonistic to uncontrolled growth regulation, tipping the balance into carcinogenicity. Aquatic, pointedly investigative pollutant and health monitoring is essential, but unsupported by the politic, and is seen as inherently politically subversive. As the cancer grows, it inhibits monitoring of its wild growth. This is the pathogenic paradigm facing our salmon restoration and aquatic health imperative.

Figuring out how to adequately fund our essential aquatic monitoring is highest priority. Metastatic invasion into agencies with water quality regulating responsibility politically down-regulates pointedly investigative monitoring and science in general in favor of 'political science' rather than ecologic science, necessitating federal oversight driven by law suits.

We can no longer expect adequate support for our efforts from these agencies as currently configured. Our funding for this work will have to come from other sources. The sooner we come to understand this, the sooner we can adapt in support of aquatic assessment and aquatic health. Quickly recognizing how we can acquire our monitoring capacity is a most important key to our effort. The Oregon State Legislature is blocking state agencies from properly investigating these pollution issues. Federal regulatory agencies are being pressured by lawsuits to push the state to take a more tenable action toward reducing impaired waters on the Oregon coast. The suits do

not go far enough to also encompass toxics contaminant water quality impairment in these ESA coho listed priority habitat. The Total Maximium Daily Load (IRTMDL) by ODEQ ignores the toxic contaminant issues in mid coast watersheds.

Toxic contaminant risks impair waters and salmon population recovery.

Given: Low dose waterborne copper cilia damage of apical neuronal sensory organs, with subsequent loss of survival abilities and resultant mortalities in salmon populations:

(See: Nat Scholtz et. al. NOAA Fisheries contaminants in Seattle)

Does copper also similarly damage other water-exposed cilia (e.g. gut mucus train/crystalline style cilia of freshwater mussels)?

Since copper causes these epithelial lesions, and the toxic metal pollutant lead is also known to cause epithelial lesions (via lipid peroxidation of membranes, thus causing perforated protective membranes such as the blood brain barrier as well as external membranes), if Pb and Cu are co-contaminants in water (e.g. stormwater runoff), do the resultant lesions at the apical sensory neurons allow pathogenic entry of elevated Pb and Cu into the neurons?

If so, is retrograde axonal transport of these neurotoxic metals a pathogenic mechanism to neuronal centers of fish (e.g. coho salmon young, and freshwater mussels)?

So, if olfactory, ocular, and lateral line apical neuronal entry can be neuropathologic for coho salmon presmolt, are the levels of toxic metals seen in mid coast Oregon low-calcium salmon streams high risk for neuropathic degradative, sublethal, effects for cognitive damage? Does this impair sensory and learning abilities that result in food acquisition and predator avoidance behavioral deficits with subsequent coho population decline pressures?

Does this same mechanism of toxic metal contaminant neurotoxicity contribute to the freshwater rivermussel health and population declines in waters associated with identified anthropogenic non point source metal pollutant sources in these low-calcium waters on the mid coast?

Since, these metals are hardness-dependent for Clean Water Act water quality criteria and standards determination formulas, are the proper ODEQ/EPA-required data assessment protocols applied for all hardness-dependent metals data in low-calcium western Oregon salmon habitat waters?

Is 'percent exceedence' appropriately, or inappropriately, used at times to limit 303 d listing determinations?

Is funding prioritization improperly used often to limit field resource manager water quality assessment and data gathering, in order to keep suspected non point sources starved of data that could show impairment of waters and beneficial uses reduced?

If erroneous assessments for 303d listings are a common occurrence, are we being scientifically, ethically, and fiscally irresponsible in not identifying and correcting these CWA possible violations?

Have natural resource managers, prioritizing for salmon recovery, been continuously misled for decades about metal pollutant effects on salmon decline as a limiting factor for salmon recovery by inappropriate state agency 303d assessment?

Lead, cadmium, mercury, and zinc are commonly found in tissue samples from the Lake Creek and Siuslaw River sites that are associated with major metals pollutant sources that are ignored within state planning for salmon recovery effort. These metals are well known to be calcium utilization inhibitors. If a unique water quality condition, of very low availability of exchangeable calcium carbonate, yields low buffering capacity which causes increased mobilization of metals sources in the water during pH challenge events, is this water quality condition causing river mussel shell erosion, via dissolution, to degrade shells to the perforation stage and subsequent premature mortality of all age classes? Do subsequent lower dips of $CaCO_3$ and pH also affect coho salmon presmolt as they migrate toward the ocean phase of their life cycle?

Does the high level of anthropogenic sourcing of Pb on the middle and lower Siuslaw River become bioavailable enough to contribute strongly to coho salmon decline, (an ESA listed species)?

An extensive scientific literature indicates that it does constitute a very significant risk. Fieldwork completed to date indicates high pollution rates from these toxic metals. Furthermore, the risk potential of dissolved waterborne Pb is well recognized in fisheries toxicology, yet research also indicates that it may not have to even dissolve in water to have toxic effect. Colloidal phase elemental Pb particulate, and Pb dissolved with subsequent binding to organic and inorganic colloid poses risk of direct contact of Pb with sensitive gill and gut microenvironments that are more acidic and can dissolve the Pb on tissue contact for increased dose.

The literature documents many other toxic effects of metal exposure to fish that affect their physiology and ecology from toxic metal anthropogenic NPS pollutant sources in the Siuslaw watershed. These metal sources result in impairment of water quality, yet do not show up on 303d listings or other adequate advisories from water quality responsible state or federal agencies.

We all pollute waters of the state, only some of us get caught and fined. Severity and frequency of our pollution varies greatly. Some of us pollute more than others do. ODEQ 'busts' some of the polluters that become too obvious. Lists of those found to have polluted our waters are routinely published, along with the amounts of the fines imposed. Significant amounts of money are gathered regularly.

However, 'an elephant in the room' is the state imposed double standard that perpetuates pollution by its own hand. State government routinely supports polluting practices and regulations that allow additional pollution and impairment of waters, without ever reporting this pollution to the EPA or NOAA or adding any of it to 303d lists. This apparently violates Clean Water Act intent and the law. State fishing regulations enable continued massive pollution of salmon waters, including listed coho essential habitat. Publically owned railroad bridges massively degrade and pollute coho waters while tons of lost lead fishing sinkers and boat anchors are allowed to be added to our streams every year, for many decades. This allows sport fishers to contaminate their hands, their lunches, their boats, the mucus on the fish, and their families when the contaminated fish goes into the frying pan at home. None of this water pollution ever shows up on 303d lists, and EPA does not enforce reporting. The state does not look at its own causative NPS pollutant actions. Monitoring is discouraged during prioritization, and this massive pollution is not acknowledged by the state. This is systematically, institutionally ignored by state agencies for fear of censure by the Oregon State Legislature. During prioritization for monitoring funding, no mention is ever made of the importance of these sources by ODEQ. If the subject is brought up, ODEQ says that there is no data that demonstrates that there is a problem, and that is why they don't prioritize any funds to do any adequate data collection; a real 'catch 22', and double standard. While the state specifies very high QA/QC and very difficult, involved, ultraclean sampling and lab work for any outside investigative monitoring of the pollution they are responsible for, ODEQ readily 'busts' others that they discover are polluting. For these 'busts' and fines, they do

not even require that actual water quality monitoring be done by the state to definitively determine that the water quality pollution has actually impaired the waters. It is just assumed that non government polluters have impaired the waters by their actions. One definition used for government, another for non government.

The state consistently avoids adequate systematic assessment of actions that they cause either directly, indirectly, or allow to continue with very little investigation, assessment, or regulation. Almost no monitoring funds are allowed to be prioritized for salmon restoration efforts that seek to indentify and mitigate these government associated pollutant sources.

ODEQ needs to become enabled by the state legislature and EQC to become pointedly investigative of toxic impairment. Subsequent CWA violations through any erroneous 303d listing assessments that may have taken place, or are continuing, involving hardness-dependent toxic metal sources identified by salmon restoration natural resource advisors and practitioners need to become clear.

Mitigation of the highly toxic non point source metals pollution problems is essential for aquatic health and salmon recovery.

Does the State of Oregon Department of Environmental Quality mislead natural resource managers, working for salmon recovery, by erroneously applying the wrong water quality criteria formulas for criteria exceedence determinations that drive 303d listings to the EPA for federal Clean Water Act requirements, and overall intent of the Act? Or, do they apply correct formulas and assessment? It appears that this avoidance is part of the agency resistance to high quality water quality assessment of impaired waters of the state.

If incorrect assessment is done, what changes need to be made to 303d listings, TMDL processes, toxic reduction strategies, and legal assessment of pollutant violation enforcement programs?

If 303d lists inaccurately depict mid coast low-calcium salmon habitat risks from the toxic metal non point sources identified, how will the state correct assessment of impaired waters to improve the prioritization of funds for a salmon recovery effort that should become ecologically, scientifically, ethically, and fiscally more responsible if we are to hope to be successful in time?

Pointedly investigative water quality monitoring would SAVE us money.

Fisheries biologists recognize that the Siuslaw watershed has historically supported one of the largest anadromous fish production capacities for its geographic size on the Pacific coast, while some runs are now less than ten percent of their historic levels. If the fishery decline can be reversed and aquatic health improved anywhere in western Oregon streams, it most likely would be on the Siuslaw. There are no significant dams, the proximity to the ocean leaves relatively little pollutant exposure, it receives a huge amount of rain to dilute what pollutants are present, and the benevolent marine airflow reduces, but does not eliminate, the exposure to atmospheric pollution. However, in spite of this relative geographic and anthropogenic simplicity, a large number of scientifically relevant questions arise about the pollutant exposures that we do have in the Siuslaw watershed. In-depth water quality analysis is essential to watershed aquatic health assessment if we are to balance resource beneficial use with resource sustainability.

The imperative for water quality assessment in the salmon recovery and conservation paradigm conflicts with the sociopolitical reality that pointedly investigative water quality assessment is inherently politically subversive. State legislatures don't want to have to find more funding to fix any additional aquatic environmental problems that might come to light with increased monitoring. Agencies responsible for water quality assessment and improvement are caught between a rock and a hard place, they will not get funding for the rest of the good work they do if they persist in finding additional aquatic health burdens. Too many waves risk swamping the boat, so a climate of 'head in sand attitude' is pervasive across the institutional spectrum at both federal and state levels.

This dynamic results in scientifically, ethically, and fiscally irresponsible outcomes within the salmon conservation reality. When we are told by the political side that 'monitoring costs too much', it is apparent that they have not yet learned that monitoring adequately is what drives saving money! The resultant improved knowledge drives us toward understanding the aquatic reality, which would guide increased effective prioritization of whatever funds are available. Monitoring is the only way we are going to discover our mistakes and improve our processes. The neglect of adequate monitoring is very dangerous, and is precisely what has produced the degraded conditions to start with. Monitoring SAVES money! Monitoring can allow us the needed knowledge to improve the salmon populations and aquatic health for all beneficial uses and ecosystem services. The legislatures need to lead with a better understanding of this dynamic, and work with us to educate the public about this fiscal responsibility. The political arm needs to enable the monitoring agencies to do the environmental responsibility and mandate we have given them. Without a major reliance on the monitoring tool, we are doomed to fail to hand the beauty we have known, with a prospect of health and wellbeing, to our great great grandchildren… and they will have a much harder time surviving.

What sociopolitical pathways have evolved to result in this pervasive suppression of science paradigm? Pointedly investigative monitoring is the basic tenet of scientific method, and of intellectual credibility. "Those that have the privilege to know have the duty to act" Einstein.
We had better all figure out how to 'act' quickly.

Accurate status and trends of water quality reality are never going to become clarified if these issues are not addressed for mid coast high risk salmon habitat.

I have been advocating for decades, within the salmon restoration community, for action that actively attempts to make progress on these issues. I have always tried to do it through collaborative roundtable focus groups, newsletters, and government advisory groups such as the Oregon Fish Consumption Rate process hosted by ODEQ, and by public comment to both EPA and ODEQ when comment was solicited. I'm getting older fast and these problems are not moving adequately. It's time for me to consider other options for bringing about changes that are needed to address these vital issues for our region, for aquatic health, and for the salmon restoration paradigm.

This opinion paper introduction to more detailed accounts of the current water quality paradigm is meant to encourage the salmon recovery partnerships to advocate for increased effectiveness of water quality assessment for aquatic health.

Ray Kinney
Siuslaw watershed resident and private water quality advocate
Any comment appreciated
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Something Wrong?

If we have a five pound piece of lead to get rid of, we'd be violating federal and state laws if we just threw it over the back fence and it rolled into the creek.
The EPA was called and asked about this situation.
They said "you can't do that, you are violating laws; the Clean Water Act antidegradation provisions, and the Endangered Species Act laws".
NOAA Fisheries said that: we'd be "risking prosecution for an ESA 'taking' by violating pollution laws."

I called Oregon Dept. of Environmental Quality and the Oregon Dept. of Fish and Wildlife and I asked; if it would be good enough if I cut the lead up into small pieces and then threw them back into the creek. They said "**You could be heavily fined if that was done."**

"If I tie a string to each piece and then throw it back out, would it be OK?" **" Of course not,"** they replied.

"If I tie a hook to each string and throw it out into the stream, until it breaks, can I avoid all of those laws and fines?"

ODFW said; **"Uh oh, I wouldn't touch that with a ten foot pole!"**

Lead, from fishing sinkers lost in low calcium waters becomes bioavailable in many western Oregon streams and is toxic to fish and other aquatic organisms. Alternative sinkers that are not toxic are available. Lead sinkers in low-hardness waters demonstrably violate the intent of antidegradation provisions of the Clean Water Act.

The intent of the CWA Antidegradation provisions is violated (if not the State of Oregon interpretation and Standard). State of Oregon Antidegradation provisions apparently do not cover Non Point Source pollution. Why not? If the other Standards are supposed to adequately cover NPS waters, why can we keep adding more lost fishing sinkers that are dissolving and degrading the water quality in low calcium systems? How can we allow degrading railroad bridges to add huge quantities of lead-based paint chips and toxic metal leach water to our mid coast salmon streams.

"There is no threshold below which lead remains without effect on the central nervous system".

(Brain Research 1998 Jul;27 (2):168-76).

"Fish brain lead levels tend to reach equivalent concentrations to the dissolved lead water levels fairly quickly" (Dan Weber, personal communication).

Chronic low dose environmental pollutants are coming to be understood as very important threats and limiting factors for salmonid ecology as well as for human health. We, on the mid coast of Oregon, are especially at risk from these pollutants due to the very low calcium bioavailability in our watersheds, especially during buffering challenge events at high risk sites.

How can we justify continuing to add toxic metals to these high-risk watersheds?

The Clean Water Act pressures the states to list polluted waters, but this also places a political bias for the states to avoid adequate WQ assessment to determine additional polluted sites and sources beyond what the feds already know about. The state legislature obstructs salmon recovery by ignoring the essential nature of aquatic monitoring for toxic contaminants and their adverse effects. A lot of degraded WQ never shows up on 303d lists, and won't, until a new WQ paradigm is created to allow science to drive the assessment process rather than the political arms of agencies that tend to restrict field people from pointedly investigative monitoring. A generally unsupportive, underfunded, legislature restricts access to needed funds for water quality assessment, especially for the toxics parameter. They would rather spend the money on restoration practices that don't have much chance of finding additional environmental water quality problems that would require more funding and effort to mitigate. Responsible salmon restoration effort requires pointedly investigative assessment of water quality in these low calcium, high risk, watersheds.

Aquatic health of many portions of western Oregon streams and rivers is showing signs of being degraded. Species diversity is declining, and adequate water quality data to assess this degradation is woefully lacking. There are huge data gaps for both "baseline" WQ information, and truly "investigative" WQ testing.

Funding for WQ testing has been totally inadequate to the task of assessing watershed health. What funds that have been allocated are often used for baseline information gathering; to the detriment of pointedly investigative testing that is urgently needed for the salmonid decline issue. Investigative testing that has been done, has often been done at levels of detection that are not good enough to take advantage of the "best available science" research for aquatic toxicology; insipid Clean Water Act 303d lists have resulted. Funding practices for CWA 303d compliance has resulted in a strong political bias for not finding any additional WQ problems that would then require further funding. Baseline WQ assessment is very much needed, not having enough has been a major source of our current ignorance, but now we need rapid pointedly-investigative assessment of contaminant presence and

aquatic health-limiting effects if we are going to have the knowledge and capability to turn salmonid decline around in time.

The Oregon Plan is much less than what it needs to be until this bias is reversed to allow for a well-funded, truly investigative, attitude by the state. Since very little water quality monitoring and risk/alternative assessment has taken place in the field, in the coastal watershed environment with its unique set of water characteristics, site-specific risk assessment and alternatives assessment are greatly impaired. As a result, salmonid diversity and population recovery efforts are much less than what they should be.

With all of the funding being spent on salmonid population recovery, certainly there should be funds for pointed investigation of many aquatic toxicologic questions relevant to fisheries decline in coastal watersheds. Ignorance of chronic low-dose toxics research combined with a political climate that does not promote sustainability of many resources could easily doom the fisheries recovery effort.

Lost fishing sinkers from recreational angling on Lake Creek, a major Siuslaw tributary, probably constitutes an ESA "taking", certainly violates the intent of the CWA antidegradation provisions, and violates the intent of the Magnuson-Stevens Fishery Conservation and Management Act; yet, dissolved lead, and total recoverable lead, do not show up on 303d lists so it is not going to be part of the states' SB 1010 process on the Siuslaw to establish TMDLs. Since it does not have 303d status, and is not an agriculturally generated pollutant problem, it has much lower priority status in the States' pollution monitoring and control process. Since lead fishing sinkers are demonstrably polluting these low-calcium waters with dissolved, total recoverable, and colloidal particulate that can dissolve in fish gill and gut, 303d lists that only derive from 'existing data' are dangerously misleading to natural resource managers that are striving for sustainable environmental conditions for the salmon recovery effort. The TMDL process needs to address these NPS toxic metal pollutants. Massive toxic pollutant input to high priority salmon habitat in the mid to lower Siuslaw river from seven railroad bridges that have degraded coatings, needs immediate pointedly-investigative assessment for inclusion to 303d listing processes and subsequent funding for mitigation.

The toxics water quality parameter is largely avoided in 303d listing and in WQ monitoring by the State. This strong bias toward not monitoring adequately for the toxics parameter is greatly lessening the Oregon Plans' ability to function effectively. When high risk waters, that are high priority salmon habitat, are having high anthropogenic inputs of toxic metal NPS pollutants, there should be pointedly investigative assessment of the ecotoxicologic risks. When carefully targeted, this investigation would often be very cost effective. Not finding our mistakes dooms us to repeating them into the future and robs us of ecosystem services that support natural resource sustainability and beneficial uses.

- **Something is wrong** in a salmon restoration paradigm if corrosive waters are not identified, and associated risks to stream biota are not assessed. EPA states that "The freshwater criterion for alkalinity in Oregon is 20mg/L or more as CaCO3 freshwater aquatic life, alkalinity should not be below this value in order to protect beneficial uses. In the Oregon listing method, that EPA followed, states that any analytical data indicating alkalinity less than the criterion were to be flagged as a Category 3B Insufficient Data- Potential Concern." Concern, because the toxicology of contaminant hardness-dependent metals increases greatly as alkalinity gets lower. Almost all surface waters in our salmon streams commonly get below 20 mg/L and often below 12. 'Potential Concern" should be corrected to be 303d-listed for alkalinity.
- **Something is wrong** when we continue to allow toxic metals to be placed into these unusually corrosive waters.
- **Something is wrong** when heavily degrading toxic paint coatings on seven railroad bridges can be allowed to degrade and leach toxic metals into the streams for decades without any monitoring for health risks to salmon and species that support the salmonid ecology.
- **Something is wrong** when hundreds of galvanized culverts can be placed in the acidic waters of mid coast Oregon salmon streams without assessment for leaching of toxic metals into cool water refugia. Industry guidelines indicate that below pH 6 galvanized surfaces dissolve faster and should not be used. Frequency and severity of pH and exchangeable Ca dips, during challenge events, may be increasing this toxic risk. If it is a problem, there are other culvert materials that could be used. Our copious leaching rainfall is less than pH6 as well, and leaches toxic metals directly into the salmon streams… without any acknowledgement from the 303d listing process.
- **Something is wrong** when ecosystem services provided by our natural resource base are not acknowledged to be valued enough to validate the need for toxics monitoring of environmental stream chemistry and toxic effects on declining salmon, lamprey, freshwater mussels, and species that support this ecology.
- **Something is wrong** when we spend countless hours in meetings while avoiding these issues within our restoration planning.
- **Something is wrong** when leaders assert that water quality monitoring for aquatic health degradation can't afford the expense of toxic metal pollutant assessment at some of these specific sites, while spending millions of dollars on culvert replacements without determining if we are thereby contributing to aquatic health decline of the species of interest that we trying to help through increased fish passage. For the price of only a couple of culvert project funds we could clarify risks for the whole mid coast ecosystem.
- **Something is wrong** when sportfishing methodologies dump tons of toxic metals into these salmon streams while also contaminating the fishers and their families, toxic levels of lead end up in the frying pan at home, and contaminated hands allow direct poisoning through mouth and skin while fishing on the river and eating lunch. Alternative sinkers are produced.
- **Something is wrong** when coho smolt size gets smaller over the coho geographic range while in just a few sites they remain large. Surely this isn't 'ocean conditions' manifesting.

- **Something is wrong** when smolt size drops while there appears to be lots of food available, especially where returns are only 1 to 10% of historic run size.
- **Something is wrong** when we read scientific literature about lead, cadmium, methylmercury, and zinc toxic effects of growth inhibition and increased rate of peristalsis in fish that reduces nutrient uptake, yet we don't think that it is appropriate to investigate whether or not the toxic metal pollution might be causative of poor growth.
- **Something is wrong** when lead, cadmium, zinc, copper, and methylmercury are known in scientific literature to cause behavioral changes that reduce prey capture abilities, predator avoidance abilities, and ability to seek new prey opportunities when they present themselves… and we don't investigate these toxic metal pollutants in our low calcium streams as salmon, lamprey, and freshwater mussels continue to decline.
- **Something is wrong** when young children are placed into river pothole 'bathtubs' to play while the older people are swimming in the stream. These potholes very often contain high levels of lead that can pass through the skin to poison the children.
- **Something is wrong** when we have children 'play a game of collect the most sinkers' from the bottoms of our salmon streams with their bare hands, and don't tell them that they are poisoning themselves with something that could make them dumber and less healthy as they grow older.
- **Something is wrong** when we have known of the toxicity of lead for more than a thousand years and still we don't know enough not to clench lead sinkers to the fishing line with our teeth, or eat an apple with hands contaminated from tacklebox lead particulate.
- **Something is wrong** when scientists that know these things don't stand up and shout it out to the agencies responsible for water quality, aquatic health, and human health.
- **Something is wrong** when these agencies don't respond to their scientific advisors with appropriate recommendations (or demands) enough to cause the politic to appropriately respond.
- **Something is wrong** when these toxic metal pollutants make us dumber and seemingly unable to think well enough to deal with these real world problems.
- **Something is wrong** when we produce 85,000 new chemicals and only do any toxicity testing on a few hundred, before spreading them out all across the land, water, and breast milk.
- **Something is wrong** when we don't question authority, and ourselves, enough to allow it all to go on like this without our appropriate oversight.
- **Something is wrong** when we continue to allow, or even promote, illegal riparian refuse dumping of toxic substances that can then enter the water (e.g. lost lead sinkers, and lead bullets).
- **Something is wrong** when we build new gardens on the sites of old orchards that have been polluted by decades of pesticide lead compound and arsenic applications, and then apply chealator formulations such as glyphosate that can increase mobilization and uptake of the lead.
- **Something is wrong** when we do not protest enough while trash fires burn wood painted with lead based paint, treated wood, old tires, thermometers, fluorescent bulbs etc. and nobody helps them understand the damage they spread across the land and the people.

- **Something is wrong** when we put pressure-treated wood into the river where the toxic metals can leach out and poison aquatic organisms.
- **Something is wrong** when it is suggested that it is not worth funding investigation of how much harm might be done to salmon restoration, lamprey conservation, mussel conservation, and human health by these behaviors.
- **Something is wrong** with a restoration and conservation effort that fails to convey to politicians, and public, enough of the value that the ecosystem services provide for our benefit, and the full appreciation of the costs we pay when we are unable to provide sustainability of our natural resources, human health, and aquatic health.
- **Something is wrong** when environmental agency managers say that it costs too much to do water quality toxic metals sampling, when in reality it is actually not very costly; and could greatly help restoration effort by clarifying decline causation factors that we could then mitigate and see resultant increases of beneficial ecosystem services far beyond the cost involved with the metals sampling and analysis.
- **Something is wrong when** the state agencies 'bust' individuals, corporations, and organizations for pollution events identified, yet the state will not pointedly investigate its own involvement in pollutant causation that can be readily avoidable by using viable alternatives. Fishing regulations should require use of alternative, less toxic, materials than lead fishing sinkers.

When people enter the mid coast Oregon watersheds, they enter a danger zone, a low-calcium danger zone. At first thought this is an absurd notion, on second thought it seems plausible, upon closer examination it becomes reality. We need pointedly investigative assessment of frequency and severity of pH and $CaCO_3$ dips. We need to clarify how these environmental conditions affect aquatic health of salmon, lamprey, freshwater mussels, humans, and other species that support the salmon ecology.

This means that water quality monitoring and assessment are not just 'nuisance tasks' within the salmon recovery and conservation paradigm, relegated to small line item status as an afterthought. They are essential components of high assessment value that are greatly reduced by political bias that seeks to minimize the science involved in salmon recovery if that science is likely to discover new 'problems' that will have to be funded and dealt with.

We need to know where and when freshwater acidification pressures, and associated toxic effects, are limiting aquatic health and salmon recovery in mid coast Oregon watersheds.

Lead-exposed organisms often increase their 'perseverative behaviors'; they persist in trying a behavior beyond the time that they should have switched to trying another behavior. If a lead-exposed fish is capturing and eating one particular size of prey, because that item is biologically efficient, and then a more biologically efficient prey opportunity presents itself, if that fish remains trying to catch only the less efficient prey, that fish becomes less able to compete. Lead can cause a decreased ability to seek biologic advantages. A lead-exposed fish can continue to try to feed on a food source that is becoming scarce, beyond the point at which a less lead-exposed fish would have switched to the better food source. A lead-exposed fish, 'in the hand', may look healthy yet have less fitness to survive in the ocean phase. Low levels of hardness-dependent metals can become much more toxic in low-calcium waters than other waters. Lead fishing sinkers, lost in most other waters, would not be as much problem as they are here.

"There is no threshold below which lead remains without effect on the central nervous system".

(Brain Research 1998 Jul;27 (2):168-76).

"Fish brain lead levels tend to reach equivalent concentrations to the dissolved lead water levels fairly quickly" (Dan Weber, personal communication).

Sources of lead exposure within the aquatic health reality of the Siuslaw watershed have been identified, dissolution of this elemental lead is readily demonstrated, and it has been found in tissues of fish, mussels, and crayfish. Now, we need pointedly investigative assessment of details of this, generally unrecognized, threat and limiting factor as it relates to aquatic species population declines in mid coast Oregon freshwater habitat. Something is wrong.

We need to stop adding toxic metals to streams in our low-calcium high risk waters until this assessment is adequately accomplished.

Herbicide degradates:

Herbicide drift from aerial spraying during forestry application is a well known phenom in the risky microclimates of the Oregon coast range. Though little data has been gathered through official monitoring of unintended off site movement, it has been common for strong pesticide odors to be associated with adjacent properties. New investigation of the Triangle Lake (Lane County) human urine elevation of 2/4D and atrazine metabolites, during times of year considered to be at low risk of persistence in the body, has caused a multiagency level of concern.

The current data is suggestive of widespread human uptake of these compounds and warrants investigation of Forest practices Act BMPs associated with aerial spraying in the coast range forest management paradigm.

If there is widespread human exposure in similarly high risk areas, we must expect that water and coho salmon habitat are at risk as well. The degree of risk is still debatable and subject to needed further investigation, however, the chemical trespass aspects are a major concern to coast range residents. If 'existing data' is not sufficient for inclusion into the new mid coast TMDL process, the TMDL aspect of "adequacy of stream buffers for application of certain chemicals" should warrant careful considered inclusion into the current process. Where children in these areas are experiencing these chemicals in their urine, we must take the utmost care in our assessment of NPS pollutant loads from pesticide use from forestry and other local sources. Even the 'old TMDL process' was supposed to be concerned with 'analysis of water quality problems', the new process should be more inclusive of potentials for contaminant risks. 'Existing data' should not be the only criteria for NPS pollutant concern, and past assessment of what little data does exist should be revisited to see if any of it suggests such widespread exposures to forestry use herbicides have been affecting human and aquatic residents of our watersheds. The atrazine and 2/4D metabolites were the only specifics tested for in the children, leaving open the distinct possibility that other forestry use herbicide formulations are also being transported off site to produce unintended exposures.

See:

Urinary Biomarkers of Prenatal Atrazine Exposure and Adverse Birth Outcomes in the PELAGIE Birth Cohort

- Article**Cécile Chevrier[1,2], Gwendolina Limon[3], Christine Monfort[1,2], Florence Rouget[1,2,4], Ronan Garlantézec[1,2,5], Claire Petit[1,2], Gaël Durand[3], Sylvaine Cordier[1,2]**

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Abstract

Background: Despite evidence of atrazine toxicity in developing organisms from experimental studies, few studies—and fewer epidemiologic investigations—have examined the potential effects of prenatal exposure.

Objectives: We assessed the association between adverse birth outcomes and urinary biomarkers of prenatal atrazine exposure, while taking into account exposures to other herbicides used on corn crops (simazine, alachlor, metolachlor, and acetochlor).

Methods: This study used a case-cohort design nested in a prospective birth cohort conducted in the Brittany region of France from 2002 through 2006. We collected maternal urine samples to examine pesticide exposure biomarkers before the 19th week of gestation.

Results: We found quantifiable levels of atrazine or atrazine mercapturate in urine samples from 5.5% of 579 pregnant women, and dealkylated and identified hydroxylated triazine metabolites in 20% and 40% of samples, respectively. The presence versus absence of quantifiable levels of atrazine or a specific atrazine metabolite was associated with fetal growth restriction [odds ratio (OR) = 1.5; 95% confidence interval (CI), 1.0–2.2] and small head circumference for sex and gestational age (OR = 1.7; 95% CI, 1.0–2.7). Associations with major congenital anomalies were not evident with atrazine or its specific metabolites. Head circumference was inversely associated with the presence of quantifiable urinary metolachlor.

Conclusions: This study is the first to assess associations of birth outcomes with multiple urinary biomarkers of exposure to triazine and chloroacetanilide herbicides. Evidence of associations with adverse birth outcomes raises particular concerns for countries where atrazine is still in use. (See full paper for details.)

Atrazine is known to be 'gender`bending', with eggs developing in the testis of amphibians, fish, and mammals. Wide dispersal of atrazine within our watershed should be investigated as a limiting factor for population recovery efforts for salmon, frogs, and for human health effects. Forestry applications, transport right of way applications, and landowner uses need assessment for toxics reduction strategy potential ASAP.

If Oregon has agreed, as part of the new TMDL process to "Identify specific nonpoint sources, **including** logging, in each TMDL", it would appear that the traditional approach of just including agricultural NPS and forestry NPS, must expand the scope into other nonpoint sources that obviously are affecting the water quality in these high risk low-calcium coho salmon spawning and rearing streams. The counterproductive effects of a narrowly confined TMDL that leaves out essential NPS concerns would mask and mislead about NPS accumulative effects within the water quality reality in 'the field' that we as natural resource managers must work in to accomplish our goals toward aquatic health. If we are mislead by a TMDL that does not clarify that many contaminant concerns are beyond 'existing data', and pose risks of being limiting factors for beneficial use and aquatic health, we will fail the Clean Water Act intent. We may not have the funds readily available at present to adequately address many of these water quality concerns for further investigation, but that does not mean that we should not 'place our concerns onto the table' for prioritization.

Fishing methodologies that bring high risk of human and aquatic exposures, railroad bridge coating degradation contamination pollutants, and pesticide exposures are all indicative of societal risks that residents of these watersheds are experiencing in these mid coast watersheds. A TMDL process for NPS assessment that omits this reality does not serve us well. An adequate pollution assessment and reduction process by the state of Oregon is essential for our residents, if the 'new' TMDL process will not cover this imperative, how will the state provide for this in a timely and socially responsible way? The new Oregon Fish Consumption Rate, that drives the WQ Standards and Criteria for toxic contaminants, is another imperative that should enter into creating a more responsible TMDL process and NPS water quality improvement program by the State of Oregon. ODEQ needs to be better empowered by the legislature to be able to respond to our essential water quality degradations limiting beneficial uses. Quality Water/Quality Life is an essential and cost effective part of the societal infrastructure that the CWA intent affirms, Oregon should be more strongly advocating for this cost effectiveness, intent, and societal wellbeing.

A note about glyphosate herbicides:

If glyphosate works to inhibit the shikamate pathway in plants, stopping the plant from making essential amino acids, yet the chemical industry claims that glyphosate is safe for humans because humans don't use the shikamate pathway, how can the industry legitimately ignore that the huge number of beneficial gut bacteria that DO use the same pathway are potentially significantly affected? Our intestinal biome is very important for our health, does glyphosate adversely affect intestinal homeostasis, reducing nutrient uptake and contributing to pathogenicity? Does human consumption GMO corn glyphosate content adversely affect gut bacterial assemblages? What pathways can be affected? Has this been adequately taken into account during recent approval for increased allowable glyphosate food content?

Forestry use glyphosate applications in the high risk Oregon coastal mountains lead to risks of elevated body tissue concentrations, just as atrazine and 24D have shown up in urine testing of rural residents, yet urine glyphosate is not an additional analyte in the official investigatory process. Why should urine testing of glyphosate pollution into humans not be a part of the study? European investigations routinely sample and analyze urine for glyphosate.

Something is wrong.

Pointedly investigative water quality monitoring SAVES us money

Fisheries biologists recognize that the Siuslaw watershed has historically supported one of the largest anadromous fish production capacities for its geographic size on the Pacific coast, while some runs are now less than ten percent of their historic levels. If the fishery decline can be reversed and aquatic health improved anywhere in western Oregon streams, it most likely would be on the Siuslaw. There are no significant dams, the proximity to the ocean leaves relatively little pollutant exposure, it receives a huge amount of rain to dilute what pollutants are present, and the benevolent marine airflow reduces, but does not eliminate, the exposure to atmospheric pollution. However, in spite of this relative geographic and anthropogenic simplicity, a large number of scientifically relevant questions arise about the pollutant exposures that we do have in the Siuslaw watershed. In-depth water quality analysis is essential to watershed aquatic health assessment if we are to balance resource beneficial use with resource sustainability.

The imperative for water quality assessment in the salmon recovery and conservation paradigm conflicts with the sociopolitical reality that pointedly investigative water quality assessment is inherently politically subversive. State legislatures don't want to

have to find more funding to fix any additional aquatic environmental problems that might come to light with increased monitoring. Agencies responsible for water quality assessment and improvement are caught between a rock and a hard place, they will not get funding for the rest of the good work they do if they persist in finding additional aquatic health burdens. Too many waves risk swamping the boat, so a climate of 'head in sand attitude' is pervasive across the institutional spectrum at both federal and state levels. This dynamic results in scientifically, ethically, and fiscally irresponsible outcomes within the salmon conservation reality. When we are told by the political side that 'monitoring costs too much', it is apparent that they have not yet learned that monitoring adequately is what drives saving money! The resultant improved knowledge drives us toward understanding the aquatic reality, which would guide increased effective prioritization of whatever funds are available. Monitoring is the only way we are going to discover our mistakes and improve our processes. The neglect of adequate monitoring is very dangerous, and is precisely what has produced the degraded conditions to start with. Monitoring SAVES money! Monitoring can allow us the needed knowledge to improve the salmon populations and aquatic health for all beneficial uses and ecosystem services. The legislatures need to lead with a better understanding of this dynamic, and work with us to educate the public about this fiscal responsibility. The political arm needs to enable the monitoring agencies to do the environmental responsibility and mandate we have given them. Without a major reliance on the monitoring tool, we are doomed to fail to hand the beauty we have known, with a prospect of health and wellbeing, to our great great grandchildren… and they will have a much harder time surviving.

What sociopolitical pathways have evolved to result in this pervasive suppression of science paradigm? Pointedly investigative monitoring is the basic tenet of scientific method, and of intellectual credibility. "Those that have the privilege to know have the duty to act" Einstein.
We had better all figure out how to 'act' quickly.

Politics has often distorted water quality monitoring programs and, to the extent that this has occurred, the 'oft-quoted' 'best available science' justification for unsustainable resource management practices is harmful to science, the environment, and society as a whole. We could do a lot of good toward providing better aquatic and public health in this salmon habitat watershed if we pull together to improve our pollution detection, investigation, assessment, and regulatory control of our nonpoint sources. This means major changes are necessary. Our great grandchildren rely on the quality of our work. We need to get out there to ask better questions each day. We need to question ourselves. We need to question authority. Policy changes need to be made. We need to rapidly improve the aquatic health status and trends in our mid coast Oregon salmon habitat. We may not have funding to deal with all of the problems right now, but that does not excuse sticking our heads into the sand to avoid having to address prioritization responsibilities with scientific integrity. Our great grandchildren depend on our effort.

Our basic human rights are being violated by chemical trespass contamination from corporations that are reaping huge profits by externalizing many of their costs onto the public, and into our breastmilk.

Something is wrong.

Rough draft: to be continued

This is an opinion paper toward promoting dialogue about prioritization of effort toward aquatic health. A much more in depth presentation of these issues is available by contacting:

[redacted]
[redacted]
[redacted]

water quality advocate

Siuslaw watershed

All comment and dialogue appreciated 9/2/’13