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Designing Coastal Conservation to Deliver Human Well-being Benefits in Western Lake Erie

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Ecological & Socioeconomic Assets

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Western Lake Erie Coastal Wetlands

ASSETS

- High biodiversity
- Globally important bird areas
- Fisheries
  - Rec fishing = $1.4B
  - Commercial = $4.6M + $33M

CHALLENGES

- **Only 5% remains**
- Development & Land use change
- Loss of hydrologic connectivity
- Invasive species

Western Lake Erie
Coastal Conservation Visioning

Goal: Where can we work to benefit people and nature?

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Western Lake Erie Coastal **Ecological Targets**

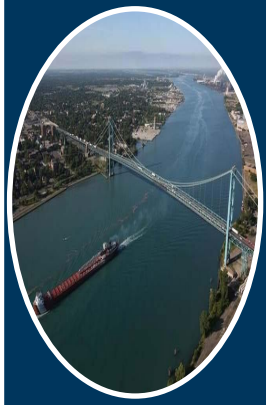
Nearshore Zone (shallow Great Lakes waters)

Native Migratory Fish

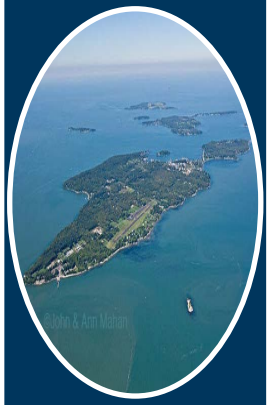
Aerial Migrants

Coastal Terrestrial Systems

Coastal Wetlands



Detroit River



Islands

Informed by *Lake Erie Biodiversity Conservation Strategy (Pearsall et al, 2012)*

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Western Lake Erie Coastal
Human well-being Targets

Human Health

Spiritual & Cultural Fulfilment

Living Standards

Connection to Nature

Informed by *Smith et al. 2013, Lovelace et al. 2011, surveys*

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Spatially represented ecological & human well-being targets and goals, costs

Ecological Targets

Representative Data Layers

Nearsh

Native

Coastal

Coastal T

Aerial M

Connec

Islands

Human Well-being Values

Representative Data Layers

Human H

Spiritual Fulfillme

Living St

Connecti

Cost ($ or index)

Land value ($): average land value in the WLEB coastal area

Wetland restoration ($): The average cost of restoring coastal wetlands in the WLEB

Phragmites treatment ($): Cost estimate for removing the invasive common reed (Phragmites australis)

Marinas (Index): Index representing marina size. Areas with marinas and lots of boat traffic would make coastal restoration more difficult.

Lake Erie and Detroit River Stress Index (Index): Index representing 34 stressors that likely have an impact on biota and ecosystem dynamics

Landbird habitat restoration ($): Cost of restoring bird habitat based on land cover and the cost of planting trees

Walleye stream habitat improvement cost (Index): Index representing the difficulty of restoring walleye habitat in streams

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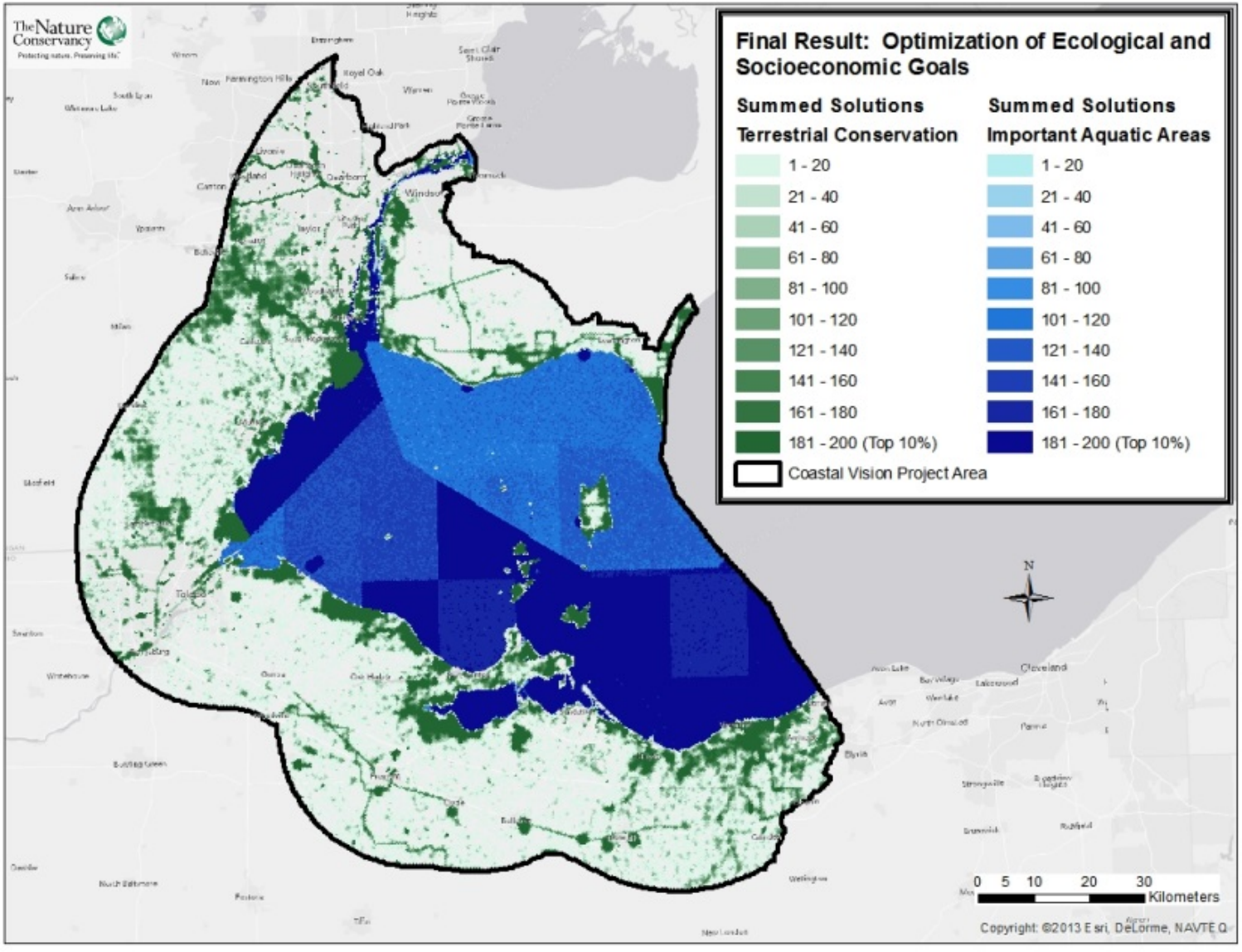
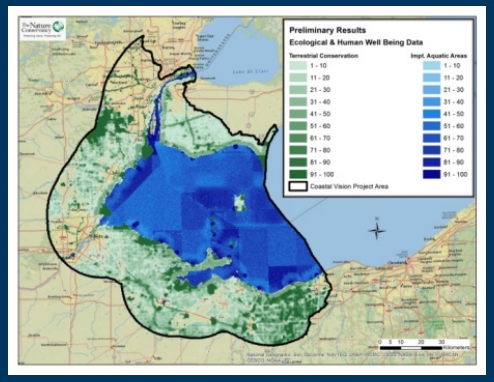
Spatial Roadmap to justify and inform actions



Use Example:
Identified priority restoration projects



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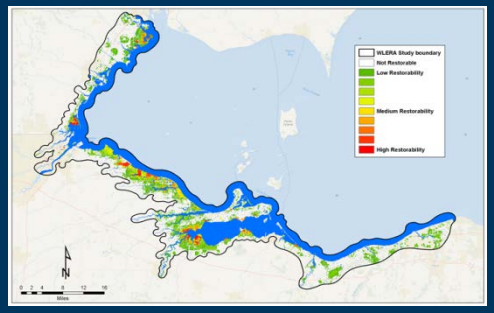

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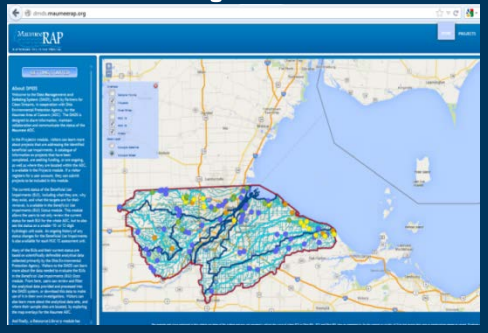

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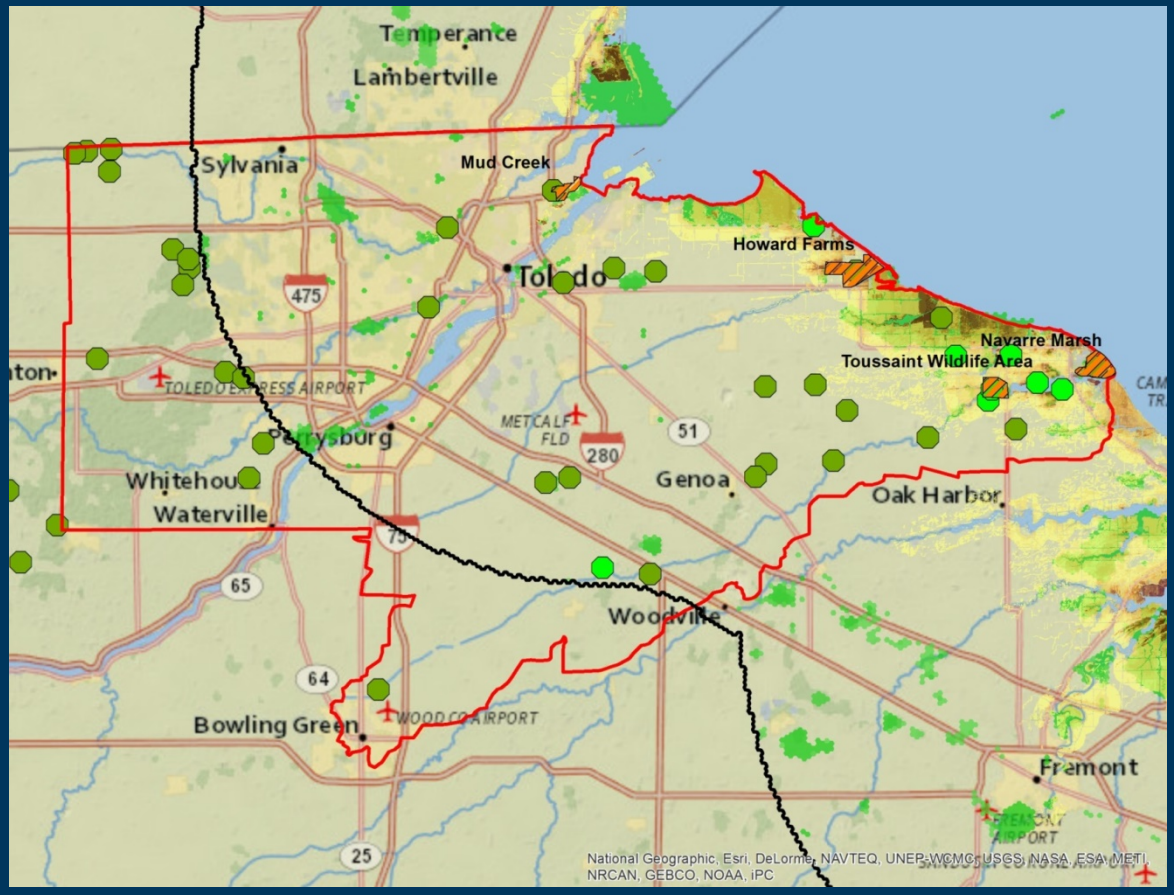

Maumee River EPA-designated Area of Concern. Priority coastal sites to delist this AOC are shown in orange.

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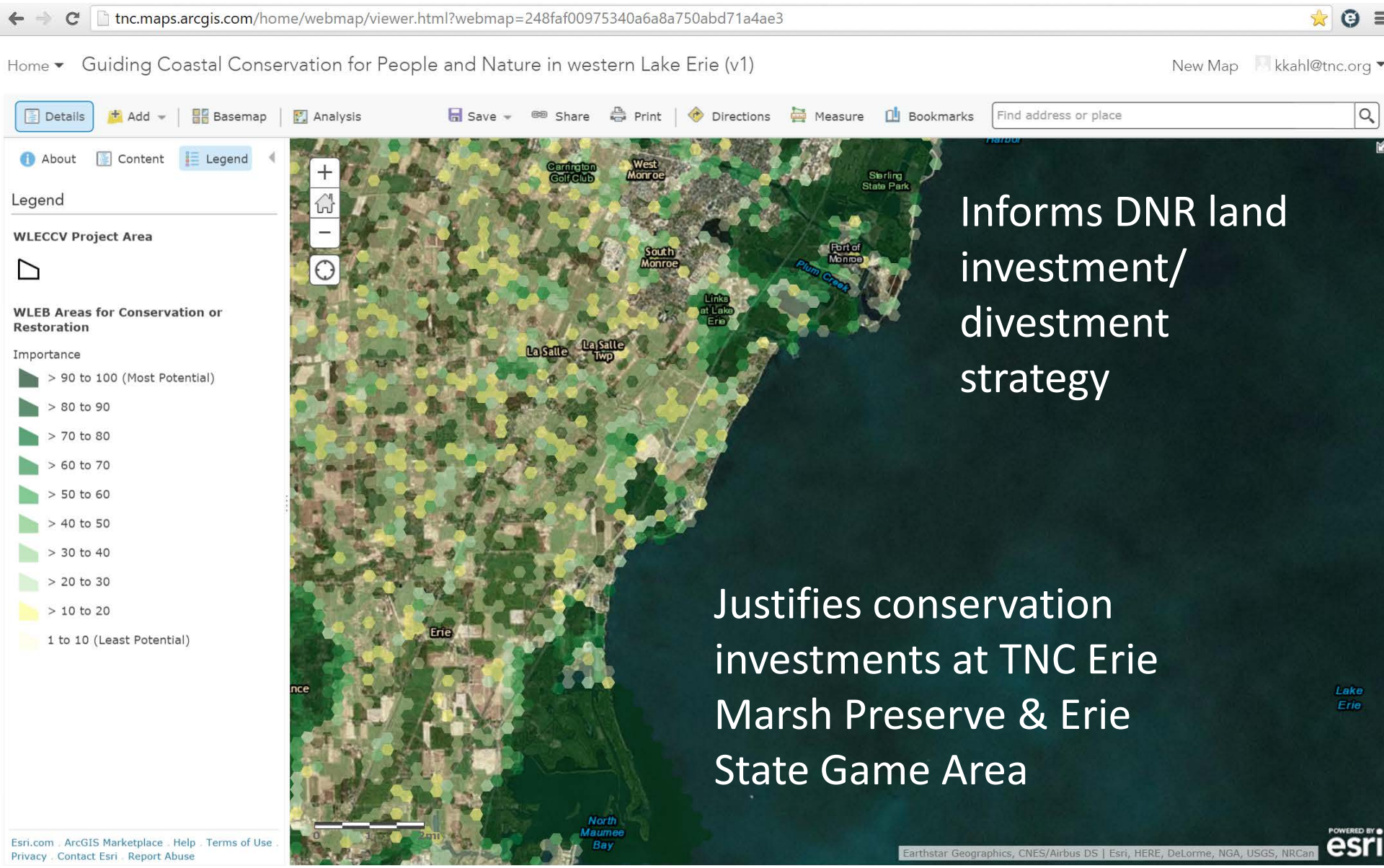
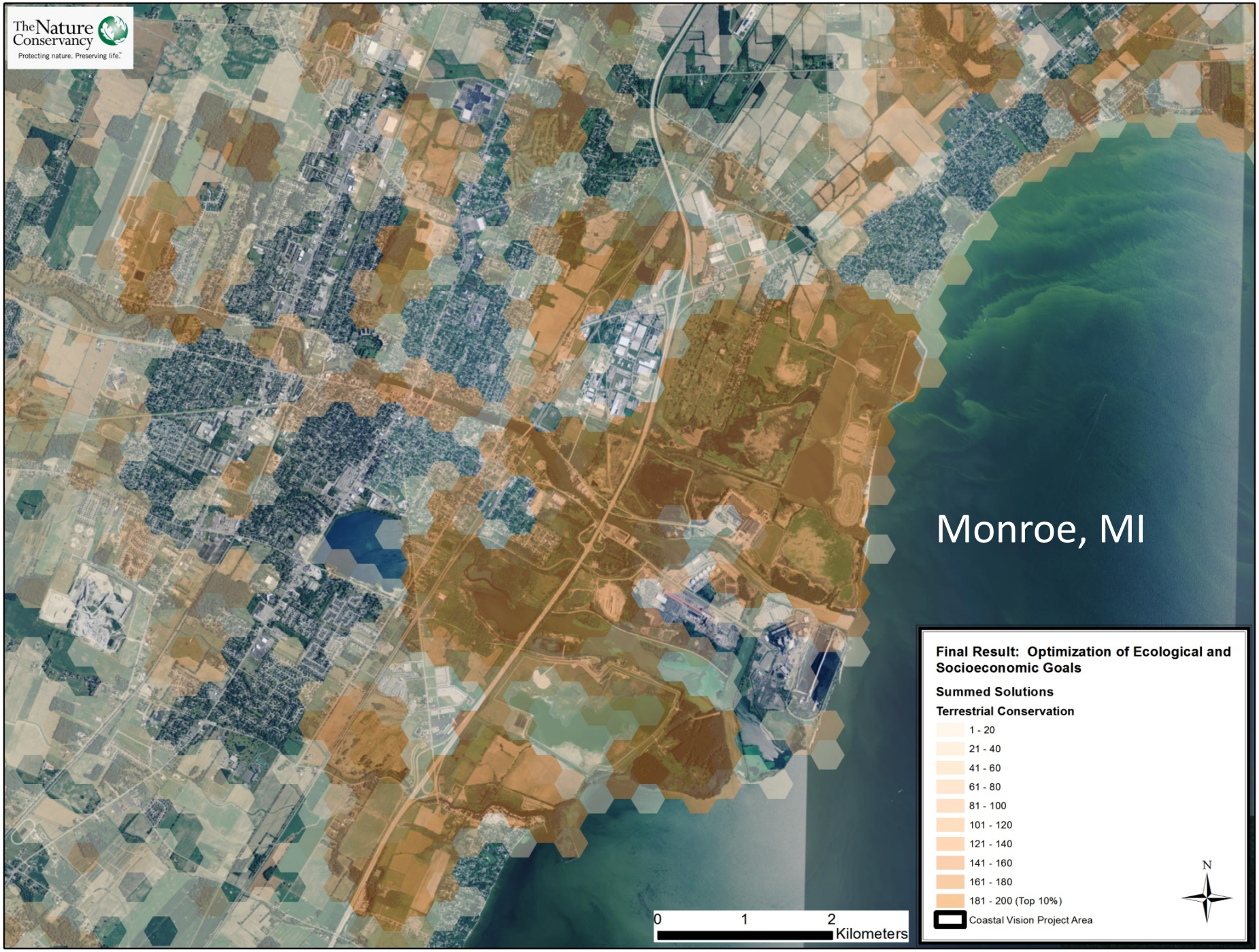
Use Example:
Informs and justifies conservation actions



Informs DNR land investment/ divestment strategy

Justifies conservation investments at TNC Erie Marsh Preserve & Erie State Game Area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Monroe, MI
Final Result: Optimization of Ecological and Socioeconomic Goals
Summed Solutions
Terrestrial Conservation
1 - 20
21 - 40
41 - 60
61 - 80
81 - 100
101 - 120
121 - 140
141 - 160
161 - 180
181 - 200 (Top 10%)
Coastal Vision Project Area
N
0
1
2
Kilometers

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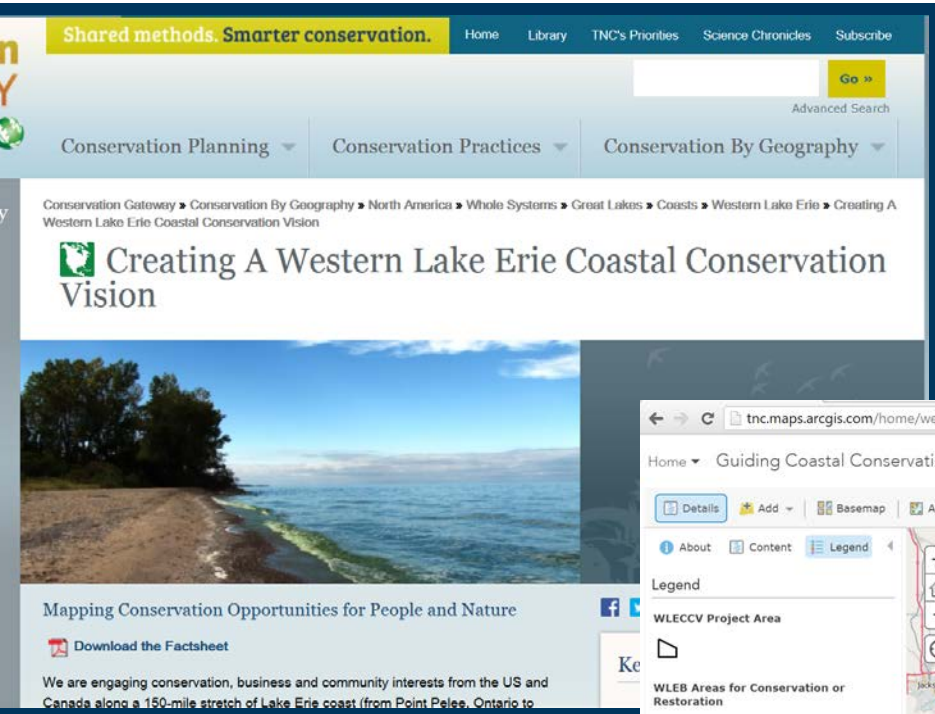
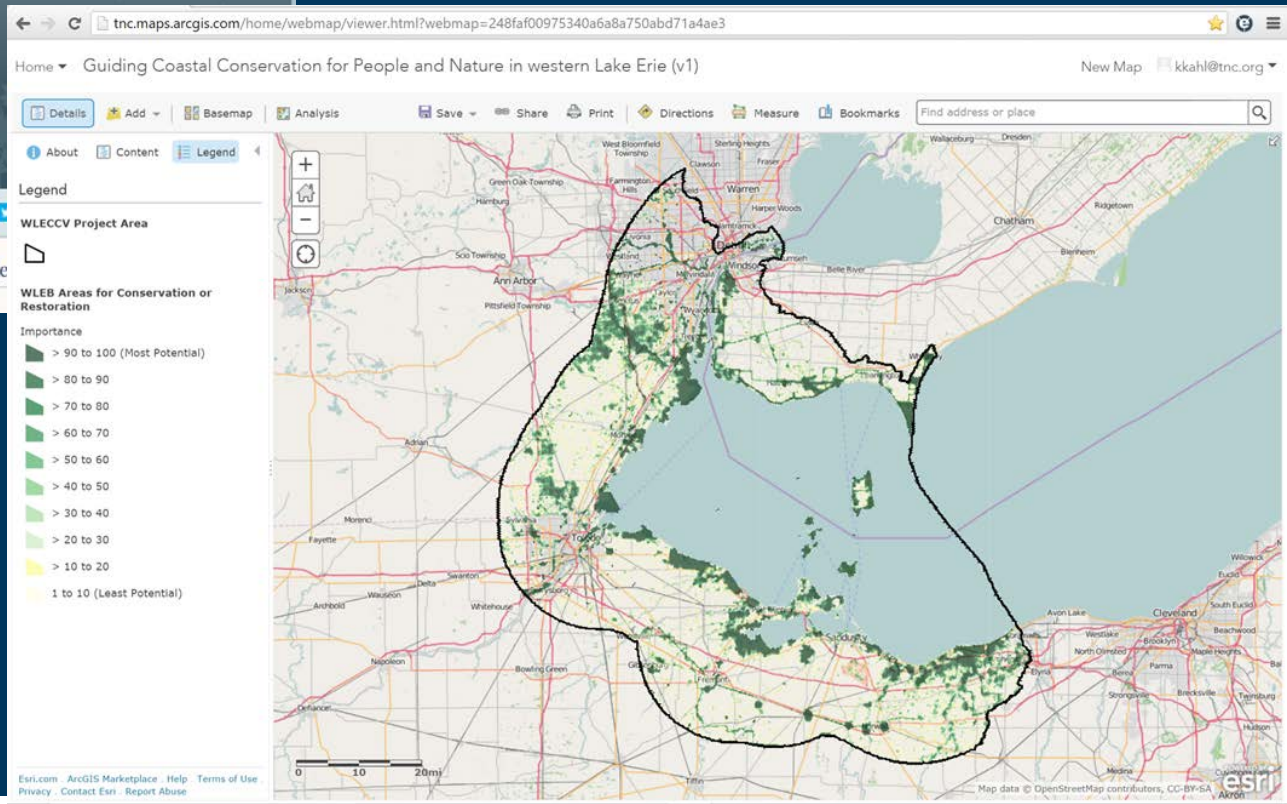
Web portal, downloadable data



http://nature.ly/WLEcoastalvision



- Factsheets
- Methods
- Data
- Goal status

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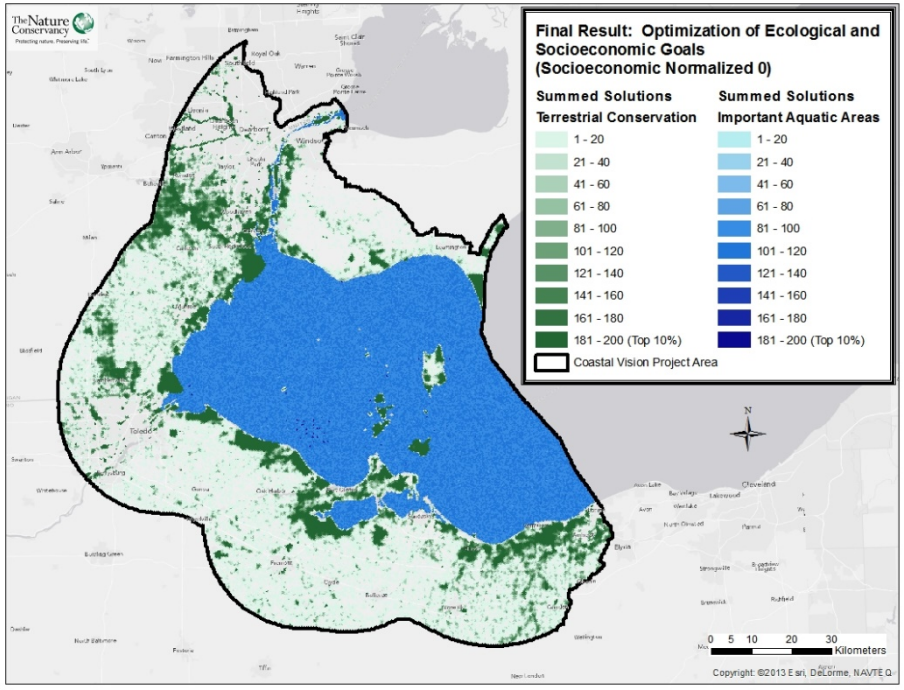
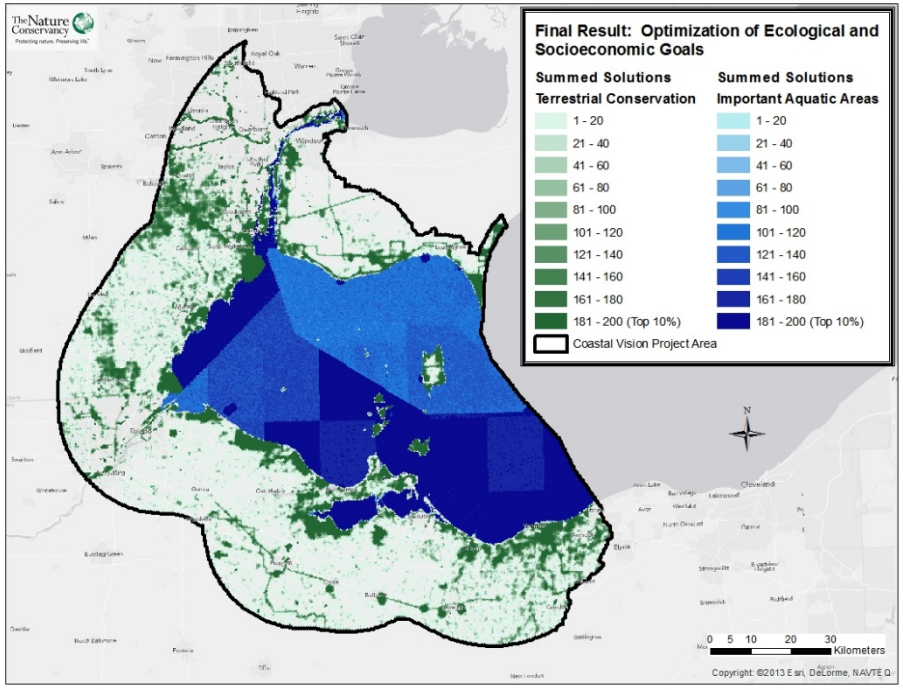
Including Human well-being Matters

Ecological goals are met



Ecological & human-well being goals are met



- 4.3% increase in land needed
- 18.7% increase in cost…but may engage a larger audience
- Scalable – LCC partnership

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In Summary…

- Developed a spatial roadmap: inform and justify conservation and community actions
- We have engaged partners: workshops, meetings, website, map portal
- We found that including human well-being matters
- We think this idea is scalable across Great Lakes
- But this was just the first step…

Potential next steps

- "1,000 cups of coffee…"
- Continued, targeted engagement
  - Viability of what looks good on paper?
  - What's in the hopper? Current priorities?
  - Is the tool useful? Identify barriers
  - Ask questions → refine human well-being targets
  - Are socioeconomic analyses needed?
  - Quantify causal connections between conservation action and impacts on people/sector
  - Further define how coastal risk is perceived
  - Translate coastal resilience tools to Great Lakes

http://nature.ly/WLEcoastalvision

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