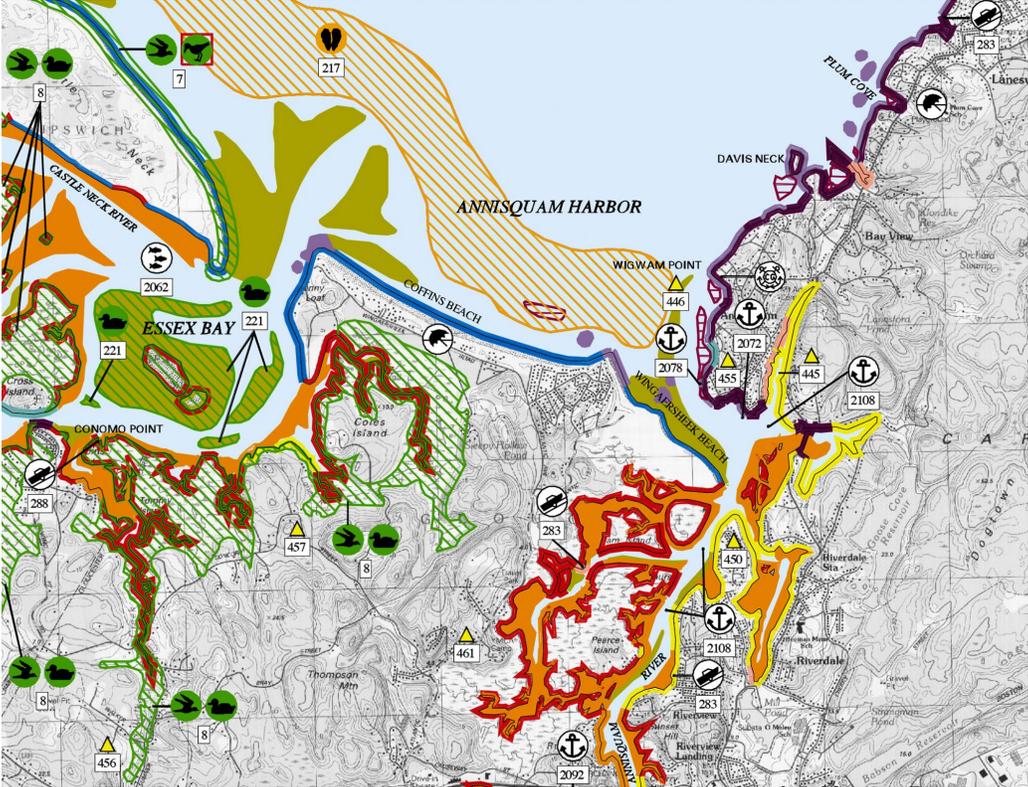


Next Generation ESI Workshop: Looking Back One Year Later

December 10, 2021



Office of Response and Restoration

Table of Contents

Executive Summary	2
Background	4
Workshop Overview and Objectives	6
Workshop Summary	7
Day 1: State Perspectives	7
Take-aways from Day 1 presentations and breakouts:	8
Presentations:	8
Breakouts:	8
Day 2: Federal and Tribal Perspectives	9
Takeaways from Day 2:	9
Day 3: Contractor Perspectives	10
Common Observations and Takeaways from Day 3:	10
Day 4: Overview, Recap, and Next Steps	11
Overview Discussion	11
Breakout Groups	11
Shoreline	11
Layer and Extent Changes (Biology and Human-Use)	11
Updates and Distribution	12
Funding Opportunities	12
Additional Funding and Cost-Related Content from NOAA Q & A on Day 1	13
Overall Workshop Recommendations	13
Appendices	14
Recording Links	14
Participants	14
Acronyms	15

Workshop Organizers:

Nicolle Rutherford, Biologist & ESI Program Manager, NOAA/NOS/OR&R/ERD

Kate Wheelock, Chief, Disaster Preparedness Program, NOAA/NOS/OR&R/DPP

Robb Wright, Geographer, Spatial Data Branch, NOAA/NOS/OR&R/ARD

Other Report Authors:

Shane O’Neal, Outreach and Policy Specialist (contractor w/ Lynker), NOAA/NOS/OR&R/ERD

Donna Roberts, Web Support Specialist (contractor w/ Lynker), NOAA/NOS/OR&R/ERD

Executive Summary

The National Oceanic and Atmospheric Administration's (NOAA) Office of Response and Restoration (OR&R) hosted a virtual workshop over four days in the fall of 2020 focused on the next generation of the Environmental Sensitivity Index (ESI) program. The workshop was attended by a mix of users and stakeholders from the federal, state, tribal, and private sectors, averaging eighty attendees per day.

The primary objective of the workshop was to explore the future of ESI mapping in a constrained budget environment. With no funding for ESIs from NOAA's base budget in recent years, the program must either drastically cut costs or identify new funding sources in order to continue producing up-to-date products that meet the critical response and planning needs of users across the country. The workshop covered what data is most important, how the data is used, and what OR&R might do moving forward to keep the ESI product as useful as possible.



This report, issued a year after the conclusion of the workshop, aims to capture the key takeaways and next steps and set a course of action to continue to develop the next generation of ESIs. Top recommendations include:

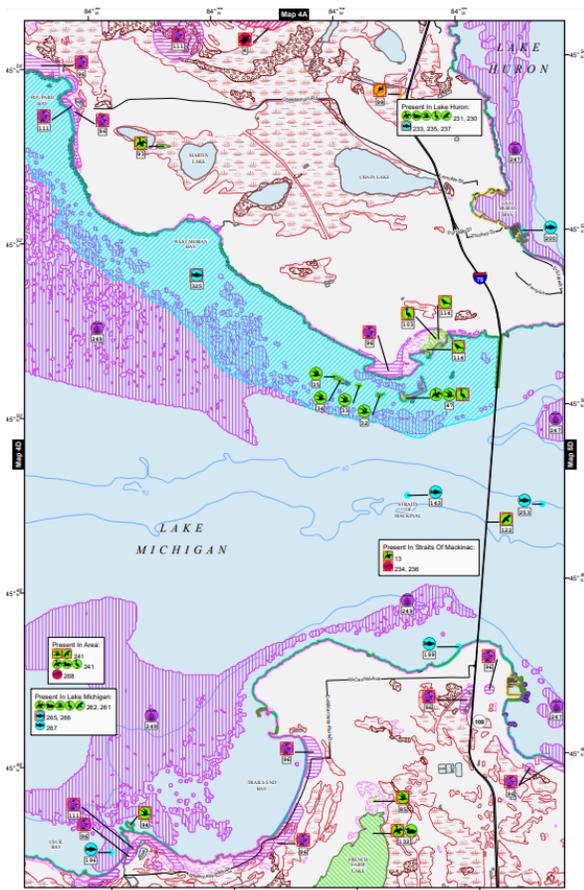
- Establish a working group on biological and human-use data layers.
- Establish a working group on the development and production of shoreline layers.
- Develop a crosswalk document to map equivalent or similar information between the CUSP, CMECS, and ShoreZone products.
- Explore the hurdles to using NRDA funds towards ESI updates.
- Engage in further conversations about funding with a wider set of partners.
- Convene a meeting of developers to discuss technological efficiencies and innovations.
- Begin research on additional indices to enhance support for coastal planners.
- Conduct additional outreach regarding the ESI product and its uses.

These recommendations are explored in more detail in the report. The organizers thank those who participated in the workshop, and welcome any feedback.

Background

Environmental Sensitivity Index (ESI) maps and data provide concise summaries of coastal resources that could be at risk in the event of an oil or chemical spill: biological resources (such as birds and shellfish beds), sensitive shorelines (such as marshes and tidal flats), and human-use resources (such as public beaches, marinas, and parks). When a spill occurs, ESI maps can help responders meet one of the main response objectives: reducing the environmental consequences of the spill and the cleanup efforts. Additionally, ESI maps can be used by response planners—before a spill happens—to identify vulnerable locations, establish protection priorities, and identify cleanup strategies. ESI maps have been produced for coastal waters of all U.S. states and territories.

ESIs are unique in that they are a comprehensive regional product that compiles a snapshot of resources in one place. NOAA ESIs are the only source for the numbered index that is the federal standard for ranking shorelines based on their sensitivity to oil spills. In addition, no other available dataset contains information related to the seasonality of species occurrence in a given area. Responders rely on this nationally consistent information to quickly and consistently assess threats as they engage in incidents across the country.



ESI maps are an integral part of preparedness, response, and recovery planning, as well as a real time decision-making tool for response operations. They are crucial to assisting decision makers, like the U.S. Coast Guard (USCG), by providing information about sensitive habitats and species in the area that could be at risk. They often drive prioritization of response options during an emergency or disaster. Additionally, the information provided by ESI maps helps responders understand when certain response options—like burning, dispersant application, or intensive manual cleanup efforts—may be inappropriate.

ESIs bring a wealth of information to your fingertips for quick and relatively easy access, including contact information for the resource experts. The cadence of response is unforgiving, and taking time to assemble the data in the midst of a response is difficult. One of the many strengths of ESIs is having information ready to go before an incident, contact information for the resource experts at your fingertips, and critical

information available quickly in an accessible, easy to read format. ESI maps also provide a basis for establishing baseline conditions for the assessment of damage to natural resources as the result of a spill.

The National Contingency Plan (40 CFR 300) specifically states that “DOC, through NOAA, provides scientific support for response and contingency planning in coastal and marine areas, including... information on the sensitivity of coastal oil and hazardous substances and associated clean-up and mitigation methods (40 CFR 300.175(b(7)).” ESI maps are a critical component of this support. They have been produced by NOAA’s Office of Response and Restoration (OR&R) for more than four decades, with important contributions of data and resources from other federal, state, local, and tribal agencies.

Unfortunately, many ESI maps are outdated; some have not been updated since the 1980s (i.e., Great Lakes, some portions of Alaska). In addition to adversely impacting response decision-making, out-of-date ESI information could make Endangered Species Act (ESA) and other consultations less effective, potentially leading to legal challenges, and may also call into question preauthorization determinations.

Updates to ESI maps involve compiling a wide range of data about shoreline type, biology, and socioeconomic resources that are sensitive to oil. While the increase in digital data has reduced some costs in development, the production of robust maps still requires substantial engagement with resource providers and classification based on ESI criteria.

OR&R recognizes that habitat, species, shoreline, and built infrastructure shifts over time make these older maps harder to rely on for decision-making. However, the resources required to keep pace with updates across the country are substantial, and OR&R makes difficult choices every year with appropriated funding to best uphold its mandates.



Workshop Overview and Objectives

This workshop was jointly organized and hosted by the Emergency Response Division (ERD), Assessment and Restoration Division (ARD), and the Disaster Preparedness Program (DPP) within NOAA's Office of Response and Restoration (OR&R).

The primary objective of the workshop was to explore the future of ESI mapping in a constrained budget environment. Understanding end-user needs is critical when considering where and how to reduce production costs. Therefore, we asked avid end-users and subject matter experts to convene to discuss and identify the most critical layers and aspects of the current tool. The results of this workshop will guide ESI developers in decision-making regarding the "next generation" of ESIs.

This workshop was postponed from March 2020 due to COVID-19 concerns, and instead took place virtually over four days from October to December 2020 as follows:

- **Wednesday, Oct. 28 – State Perspective.** We heard from states who have built similar products and about their experiences and lessons learned in doing so.
- **Tuesday, Nov. 10 – Federal and Tribal Perspective.** We heard how Federal and Tribal entities are using NOAA's ESI tool.
- **Wednesday, Nov. 18 – Contractor Perspective.** We heard from contract companies who have engaged in and supported OR&R with ESI development over the years.
- **Wednesday, Dec. 2 – Summary and Path Forward.** We summarized the previous information and discussions to better understand efficiencies and the path forward for ESIs.

Each day is discussed in more detail in this report. There are video and audio recordings available for each day through the Adobe Connect platform ([links available in Appendix](#)). Each day's schedule roughly followed this format:

- Two hours in the morning, beginning at 11:00 am ET/8:00 am PT.
- Two hours in the afternoon, beginning again around 2:30 pm ET/11:30 am PT.

Workshop Summary

The workshop took place over four days in late 2020, and each day is summarized in this section. The first two days of the workshop kicked off with a welcome from OR&R Director, Scott Lundgren, and an overview of ESIs from Dave Wesley, Chief of the Technical and Scientific Services Branch of ERD. Each day, participants asked questions pertaining to ESI funding history and mechanisms. These are captured in more detail in the [Day 4 funding discussion](#).



Day 1: State Perspectives

The first day of the workshop, conducted on October 28, 2020, provided a platform for several states (Texas, Maine, California and Florida) and the Environmental Protection Agency (EPA) Region 5 to discuss similar tools they have built. We asked four main questions to guide the presentations:

- How did they create their own tool?
- How does it differ from NOAA's ESI tool?
- Why did they create their own tool?
- What data do they prioritize?

There were 89 participants on this first day, including representatives from:

- Federal agencies
 - NOAA, USCG (Headquarters and Districts 5, 8, and 9), EPA, and DOI (BSEE, NPS, FWS).
- State agencies
 - Florida, California, Texas, Alaska, Michigan, Washington, and Maine.
- Other organizations
 - Great Lakes Commission, OSRI, and Gulf Coast Ecosystem Restoration Council (established by the RESTORE Act).

External contract companies involved with ESI development were not invited to attend this session.

Take-aways from Day 1 presentations and breakouts:

Presentations:

- Manipulating data to fit ESI data standards is time consuming.
- All agree that printed maps can be useful, and 11" x 17" is preferred to 8.5" x 11".
- Not all current ESI data layers are needed, but each state/region has differing layer priorities/uses.
- A web-based tool is preferred.
- A NOAA map template would be well-received.

Breakouts:

- **Data:**
 - Consensus: T&E species are a high priority and must be included.
 - Potential to reduce other species data shown/collected?
 - Consensus: Shoreline classifications and index are a priority.
 - Maps are cluttered, could reduce data displayed (e.g., fewer bird groupings and shoreline classifications, reduce human-use layers).
- **Format:**
 - Consensus: Scale at 24000 is fine, most reasonable.
 - Paper is generally liked. Important for power outages, remote locations, etc.
 - Ability to map on the fly, download data (offline capability), and generation of paper products by an online tool is important.



Day 2: Federal and Tribal Perspectives

The second day of the workshop was held on November 10, 2020, and featured presentations from federal and tribal partners that are end users of ESI maps and data. The day started with an introduction from Scott Lundgren, Director of OR&R, and an overview of the ESI program and its current state from Dave Wesley, Chief of the Technical and Scientific Services Branch of ERD. The presentations focused on how each agency or tribe uses ESIs, and their thoughts on what can be improved, removed, or otherwise updated.

The afternoon session consisted of a panel discussion with a mix of pre-planned topics and other questions from the audience. This led to a robust conversation and lots of excellent ideas.

There were 75 participants for day two, including representatives from many federal agencies, state governments, and outside contract companies.

Takeaways from Day 2:

- ESIs are an information-rich snapshot of the area of concern.
- They are a critical tool used for:
 - Response plan development (ACPs, GRS/GRPs)
 - Resources at risk and identifying protection priorities
 - Drills and assessments
 - Consultations
 - Responding to spills
- Willing to reduce some human-use and biological information (but need to keep T&E and commercially important species).
- Users rely on electronic access, need better query and report tools.
- Many data sources and tools exist, but they are not centralized and it can be difficult to locate and sort through them all.
 - Should this available data feed into ESIs? Would be nice for a one-stop shop.
- Paper maps are still needed for now, but could be eliminated if data is easily available to download and use offline.
- Interest in developing a data template, but difficult to obtain all needed data.
- Decouple data layers for ease of updates.

Day 3: Contractor Perspectives

The third day of the workshop was held on November 18, 2020. This session was an opportunity to hear from external contract companies and others who have worked with OR&R to develop ESI maps and data in recent years. Presenters walked through their organization's proposals for how to reduce costs and improve efficiency in the ESI process, including reductions in data layers and improvements in data collection and processing.

The third day of the workshop had 82 participants. Due to the proprietary nature of the contractor presentations, their slides are not available for viewing and the recommendations have been generalized.

Common Observations and Takeaways from Day 3:

- Shared desire to bring ESI scope closer to original oil spill focus.
 - Some maps are bloated, can cut unneeded data or simplify formats.
 - Should reduce the area of analysis.
- Currently too many data layers to maintain cost-effectively, and not all are relevant.
 - Shoreline: simplify collection/data, use existing data if possible (e.g., CUSP).
 - Biology: reduce data, focus on T&E species, reduce attribute collection.
 - Human-use: reduce the amount of data collected, simplify classification types.
- The GIS structure is outdated.
 - ESI production needs to be more rapid and flexible.
- Desire to move away from state boundaries for atlases and adopt a national scale or geographic regions instead.
- Map outputs and data delivery can be improved. Should add tools and features.
- Want a standardized data upload template set by NOAA, ideally an enterprise database.



Day 4: Overview, Recap, and Next Steps

The final session of the workshop took place on December 2, 2020. The day opened with a recap of the previous three sessions by the OR&R team, and ended with concluding remarks from Scott Lundgren. In between, attendees were split up into four breakout groups to discuss some of the key topics that emerged over the course of the sessions. The groups then reported back, and those summary reports are captured here. Final recommendations are presented at the end of the report.

There were 79 participants in the breakout sessions on day four, divided up roughly evenly among the breakout groups based on participants' general interests and expertise.

Overview Discussion

A survey of attendees taken during an earlier session showed that most participants use ESIs through ERMA® and their own GIS installations. Many may access PDFs through ERMA though, and front line responders are likely the ones using printed/PDF maps. Although fewer, they are a critical group of users.

Breakout Groups

Shoreline

There was general agreement that shoreline classifications can be collapsed into fewer types, along with a discussion about aligning ESI categories with other pre-existing products and systems. This includes NOAA's Continually Updated Shoreline Product (CUSP), ShoreZone data in the Pacific Northwest, and the Coastal and Marine Ecological Classification Standard (CMECS) maintained by NOAA. Issues exist with each approach or product, but the amount of existing data was a point of emphasis.

ESI Next Generation Workshop

Breakout Groups

- 1 - Shoreline*
- 2 - Layers and Extent*
- 3 - Updates and Distribution*
- 4 - Funding*

Layer and Extent Changes (Biology and Human-Use)

The discussion of biological and human-use data layers covered many potential changes, but needs and priorities turned out to be highly variable across states and regions. Biological data is very regionally specific, as some types are more important to one region and less useful in another. Even a preference for point or polygon data appears regionally divergent. There was agreement to maintain a focus on threatened and endangered species, commercially valuable species, and those in high concentrations. There was discussion of focusing human-use layers on publicly managed areas and other special sites, or data that is not widely available.

The objectives of the ESI product were also raised, as the elimination or addition of data layers would depend on the intended use of the data. If other hazards are considered beyond oil spills, this would influence what data is needed by responders and resource managers. Any final decisions on these data layers will require another set of discussions or a working group. There was, however, a general recommendation to reduce or eliminate most mapping qualifiers.

Updates and Distribution

The group agreed on the goal to eventually have a nationwide ESI enterprise database in a single symbology and data format. This could serve as a baseline or database for data gathered through other means, but the template and data schema need to be agreed upon before settling on a platform. This would ideally have an improved printing tool to produce output that looks more like a traditional ESI map. There was general consensus that ERMA fills this need for now.

Another discussion topic was the desire for automatic or incremental updates to the data. Many expressed hope that data from other sources (NMFS, FWS, EPA, FEMA, states, etc.) could be tied directly to ERMA to keep ESI data up to date, and that layers could be updated one at a time. There remain many issues of compatibility between these data sources, and data is not always in a format that is usable for operational decision-making. The compiled nature of ESIs complicates this process.

A point of discussion about distribution was whether sensitive data, including endangered species and cultural resources, could be presented to responders and field users only, instead of being publicly available.

Funding Opportunities

There was a long discussion with many creative ideas about funding solutions for the ESI program. Below is a non-exhaustive list of some of the suggestions and questions:

- Could funding come from OSLTF?
 - OSLTF authorization for ESIs might take away from other OR&R appropriations.
 - It may be worth looking into rewriting this statute.
 - Consider NRT as well, as they are related.
- Including additional hazards, such as climate resilience, would be more appealing on the Hill than the current focus on oil spills and NRDA.
- The program can't count on post-disaster supplemental funding moving forward.
- We could expand the user base by making other partners aware of ESIs and their utility.
 - Could "market" them to nonprofits that could provide funding.
 - Also work with more federal agencies, as they are used by DOI, DOT, EPA, etc.
- Is it possible to require data updates as part of activity from NRDA settlements, or as part of certain permitting and management uses? Are there legal issues with this?
- When asking for funding, NOAA should emphasize recent changes implemented to make the process more cost-efficient.
- Could the GRP/GRS task force use some OSLTF funds to support ESIs?

Additional Funding and Cost-Related Content from NOAA Q & A on Day 1

- What is the relative cost of ESI printing?
 - Printing costs are minimal, but creating the PDFs is fairly expensive because each PDF is manually “crafted” to provide a good view of the data. Automated tools exist, but there's still a manual art to the map creation.
- Is ESI funding specifically requested in annual budget requests?
 - In a decreasing budget climate, NOS has not prioritized ESIs when strategically seeking funding increases.
- NOAA has not assessed where changes in the data have occurred to predict where updates will be most needed in the future (“heat maps”). However, as updates occurred so infrequently in recent decades, all maps need a refresh by now.
- Other comments on cost:
 - Work for updating an ESI is primarily contracted.
 - Primary costs are for data collection, synthesis, processing, and organization.
 - Merging all the information into a single data layer/polygon set is costly, but it is worth it to have a stable compiled data layer, rather than have individual links to original sources.



Overall Workshop Recommendations

1. Establish a working group on biological and human-use data layers. This should cover what layers to keep, what to let go, regional differences, points vs. polygons, etc.
2. Establish a working group on the development and production of shoreline layers.
3. Develop a crosswalk document to map equivalent or similar information between the CUSP, CMECS, and ShoreZone products.
4. Explore the hurdles to using NRDA funds towards ESI updates.
5. Further conversations about funding with a wider set of partners. In particular, a discussion with the NRT about how to generate support for ESI updates.
6. Convene a meeting of ESI, ERMA, and NCCOS developers to discuss technological efficiencies and innovations.
7. Begin research on additional indices to enhance support for coastal planners.
8. Conduct additional outreach regarding the ESI product and its uses.

Appendices

Recording Links

2020 ESI Next Generation Workshop

Adobe Connect Recordings

Passcode to view the recordings is: **Knowledge** (case sensitive)

Day 1 Recording (Oct. 28):

<https://noaaorr.adobeconnect.com/p8k9c1te8k0e/>

Day 2 Recording - Morning Session (Nov. 10):

<https://noaaorr.adobeconnect.com/pdlbnnr3euj2/>

Day 2 Recording - Afternoon Session (Nov. 10):

<https://noaaorr.adobeconnect.com/p7um4hyvxbbg/>

Day 3 Recording (Nov. 18):

Not available due to sensitivity of contractor proposals.

Day 4 Recording (Dec. 2):

<https://noaaorr.adobeconnect.com/p6pyp1r4ggy2/>

Participants





Acronyms

ACP	Area Contingency Plan
ARD	OR&R's Assessment and Restoration Division
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
CMECS	Coastal and Marine Ecological Classification Standard
CUSP	Continually Updated Shoreline Product
DOC	Department of Commerce
DOI	Department of the Interior
DOT	Department of Transportation
DPP	OR&R's Disaster Preparedness Program
EPA	Environmental Protection Agency
ERD	OR&R's Emergency Response Division
ERMA®	Environmental Response Management Application
ESA	Endangered Species Act
ESI	Environmental Sensitivity Index
FEMA	Federal Emergency Management Agency
FWS	Fish and Wildlife Service
GIS	Geographic Information System
GRP	Geographic Response Plan (part of an ACP)
GRS	Geographic Response Strategies
NCCOS	National Centers for Coastal Ocean Science (NOAA)
NMFS	National Marine Fisheries Service (NOAA)
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service (NOAA)
NPS	National Park Service
NRDA	Natural Resource Damage Assessment
NRT	National Response Team
OR&R	Office of Response and Restoration, within NOAA's National Ocean Service
OSLTF	Oil Spill Liability Trust Fund
OSRI	Oil Spill Recovery Institute
RESTORE Act	Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act (2012)
T&E	Threatened and Endangered Species, as designated by the ESA
USCG	U.S. Coast Guard