# EPA Tools & Resources Webinar:
# Final Ecosystem Goods and Services Scoping Tool
A tool for prioritizing stakeholders and the ways they benefit from the environment

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**February 10, 2022**

Clean Air

Biodiversity Conservation

Clean & Plentiful Water

Climate Stabilization

Food, Fuel, & Materials

Recreation, Culture, & Aesthetics

Natural Hazard Mitigation

Ecosystem Services

# Why bother with a Scoping Tool?

- Considering ecosystem services is important in decision making for the environment and public health

- Identifying **more relevant ecosystem services** ensures they are considered in the decision-making process

- Final ecosystem goods and services (FEGS) are the elements of nature that **directly benefit humans**

- Decision makers are already doing *ad hoc* prioritizations, this tool makes the process transparent, the priorities explicit, and the results explainable

- Built-in connections to a series of other ORD Ecosystem Services tools

Stakeholder Prioritization → Beneficiary Profile → Key Attribute Identification
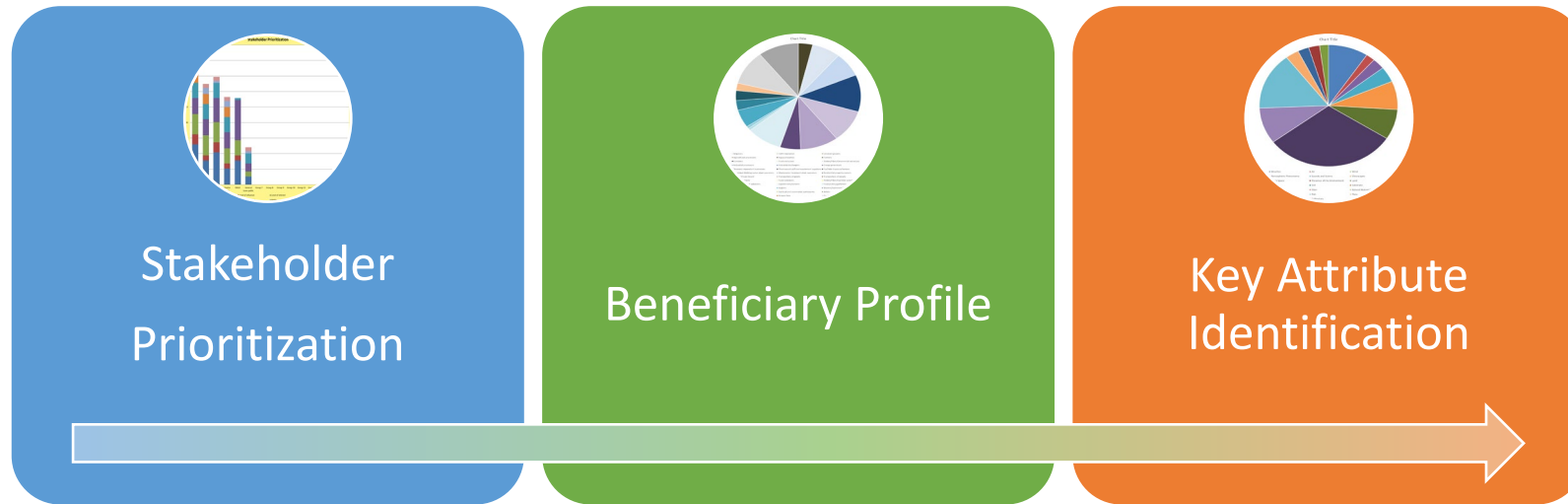
- Designed for community decision-makers
- Used at an early project scoping stage of decision-making
- To help identify and prioritize:
  - *Stakeholders*,
  - *The ways they are benefiting from the ecosystem*, and
  - *The environmental attributes necessary to realize those benefits*
- These relevant and meaningful environmental attributes can then be used to evaluate decision alternatives

- Goal: Prioritize FEGS for community-scale decisions

- Approach: Start with stakeholders, use National Ecosystem Services Classification System Plus framework to target relevant services

- Methodology:
  - Multi-criteria decision analysis (MCDA)
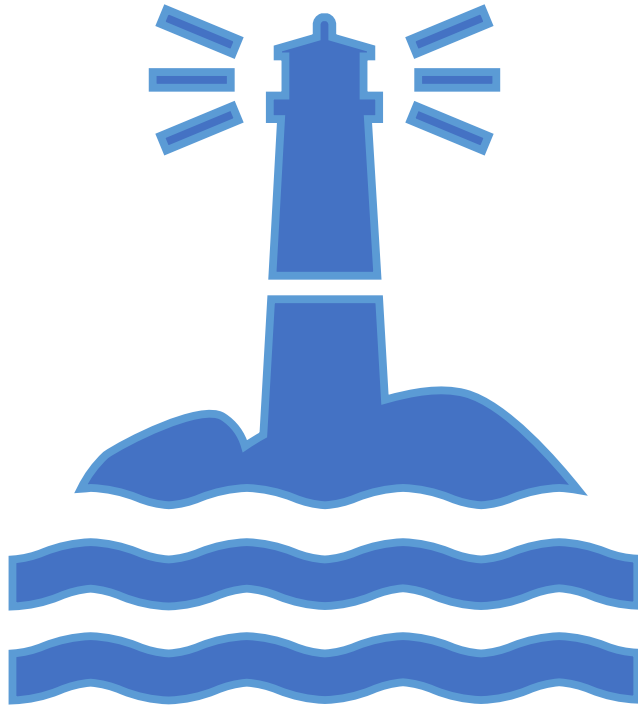  - NESCS Plus structure (links FEGS tools together)

Stakeholder

- Community g
  makers are us
  with (e.g. Spo

environment
realizing these
edible fauna,
viewscapes)

Tool development considerations:

- Downloadable executable
- EPA has no access to user inputs
- Minimal data collection needs
- Intuitive function

# Example – Port Planning

- Port management decision

- Interest in dredging for increased ship access

- Additional concerns related to:
  - Impact on residents
  - Tourism and visitor attraction
  - Recreation
  - Impact on natural areas

- At this stage NO decision alternatives are on the table

- Tool use is to help determine the ecosystem service-related metrics that should be used to evaluate decision alternatives once they've been identified

# Stakeholder Prioritization

**MCDA methodology note:**

- Criteria weights:
  - Subjective (where decision maker values come in)
  - Same weights apply to all stakeholder groups
- Criteria scores:
  - Objective
  - Individual scores for each stakeholder group

**Suggested criteria for stakeholder prioritization**

- Magnitude of impact
- Probability of impact
- Level of influence
- Level of interest
- Urgency/temporal immediacy
- Proximity
- Economic interest
- Rights
  - Legal
  - Property
  - Consumer/user
- Fairness
- Underrepresented/underserved populations

# Weights

Look over the criteria below. Identify the criterion most relevan~~t~~
criteria relative to that most valued criterion. Weights can be va~~lues~~

Once you enter the 9 criteria proceed to the Stakeholder page.

## Notes ✎ ∧

*Your notes here...*

| Color | Criterion | Weight |
|---|---|---|
| 🟥 | Magnitude & Probability of Impact | |
| 🟩 | Level of Influence | |
| 🟪 | Level of Interest | |
| 🟨 | Urgency & Temporal Immediacy | |
| 🟦 | Proximity | |
| 🟩 | Economic Interest | |
| 🟧 | Rights | |
| 🟥 | Fairness | |
| 🟦 | Underrepresented & Underserved Groups | |

| Color | Criterion | Weight |
|---|---|---|
| 🟥 | Magnitude & Probability of Impact | 100 |
| 🟩 | Level of Influence | 100 |
| 🟪 | Level of Interest | 100 |
| 🟨 | Urgency & Temporal Immediacy | 100 |
| 🟦 | Proximity | 100 |
| 🟩 | Economic Interest | 100 |
| 🟧 | Rights | 100 |
| 🟥 | Fairness | 100 |
| 🟦 | Underrepresented & Underserved Groups | 100 |



Interest (11.1%)
Influence (11.1%)
Urgency (11.1%)
Impact (11.1%)
Proximity (11.1%)
Underrepresented (11.1%)
Economic (11.1%)
Fairness (11.1%)
Rights (11.1%)
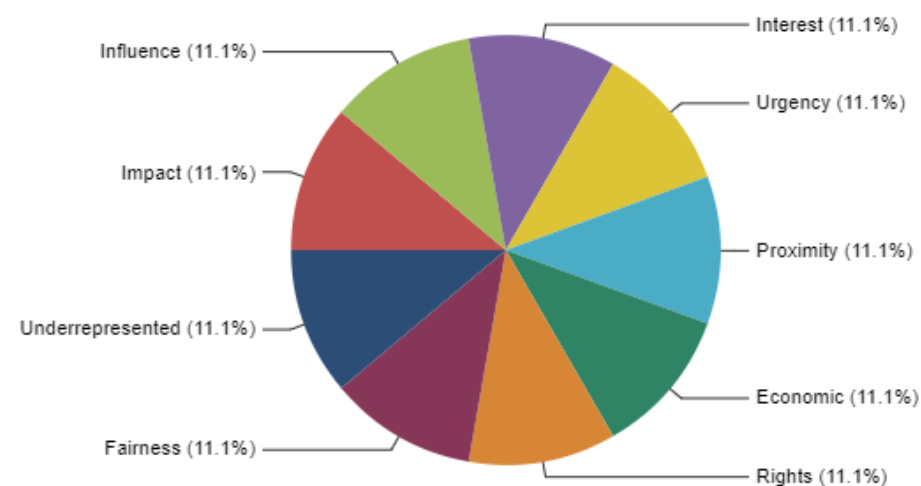
**Screenshots from tool – weighting step**
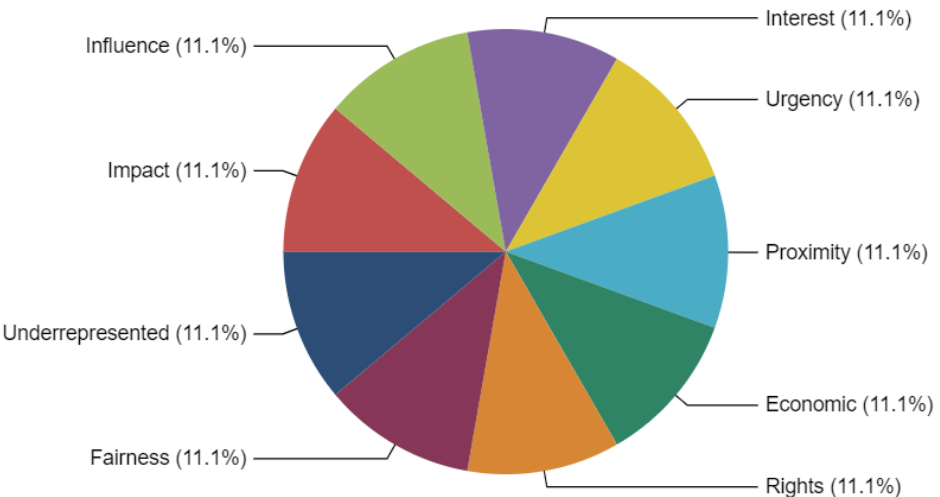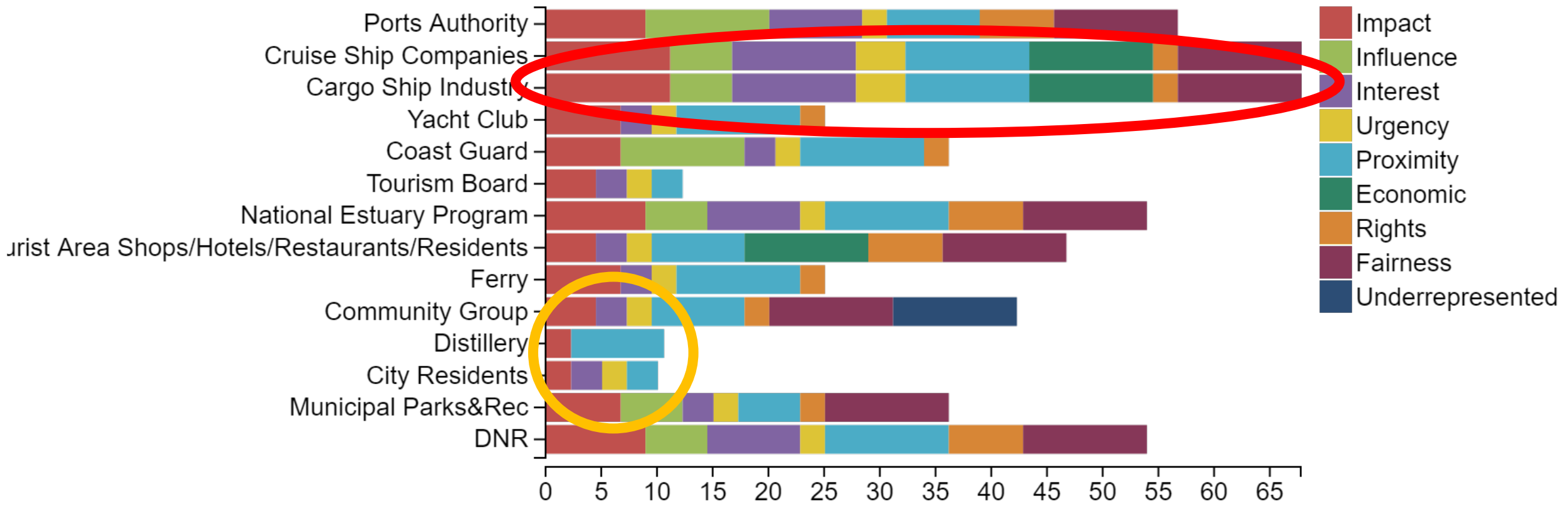
- Bar chart shows relative priority of stakeholder groups and what criteria are driving that prioritization

- In this example, groups scoring across more criteria are ranked as higher priority

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# Beneficiary Profile



**Beneficiary Profile**
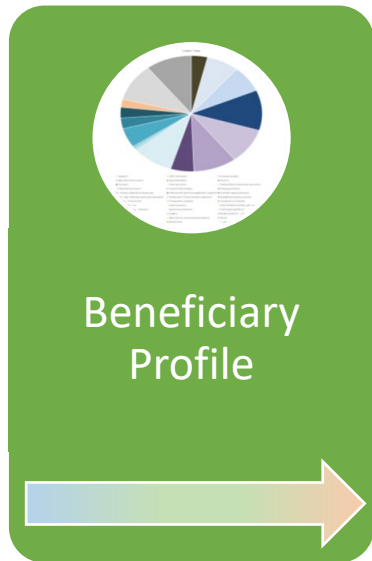
▸ **Decision makers:**
  ◦ Segment each stakeholder group into its beneficiary groups

▸ **Output:**
  ◦ Prioritized set of beneficiaries, weighted by the relative priority of each beneficiary group
  ◦ Beneficiary profile of the decision context

## Categorized list of beneficiaries

- Agricultural
- Commercial/Industrial
- Governmental/Municipal/Residential
- Transportation
- Subsistence
- Recreational
- Inspirational
- Learning
- Non-use

**Screenshot from tool – user input beneficiary step**

Bar chart (horizontal stacked) with categories from top to bottom:
- Industrial Processors
- Energy Generators
- Commercial Property Owners
- Public Energy Generators
- Residential Property Owners
- Military / Coast Guard
- Public Sector Property Owners
- Transporters of Goods
- Transporters of People
- Experiencers / Viewers
- Anglers
- Waders / Swimmers / Divers
- Boaters
- Artists
- Students and Educators
- Researchers
- People Who Care

X-axis: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18

Legend:
- SJNEP
- Catano Community Group
- Greater San Juan Area Residents
- San Juan Municipal Parks&Rec
- PRDNR
- Old San Juan Shops/Hotels/Restaurants/
- Yacht Club
- Tourism Board
- Cruise Ship Companies
- Catano Ferry
- Ports Authority
- Cargo Ship Industry
- Coast Guard
- Bacardi Distillery

Pie chart:
- Transportation (37%)
- Recreational (26.5%)
- Governmental / Municipal / Residen...
- Non-Use (9.6%)
- Commercial / Industrial (7.6%)
- Learning (5.5%)
- Inspirational (1.8%)

- Bar chart shows relative priority of different types of beneficiaries and which stakeholder groups are receiving that benefit

- Pie chart shows relative representation of beneficiary categories

# Key Attribute Identification
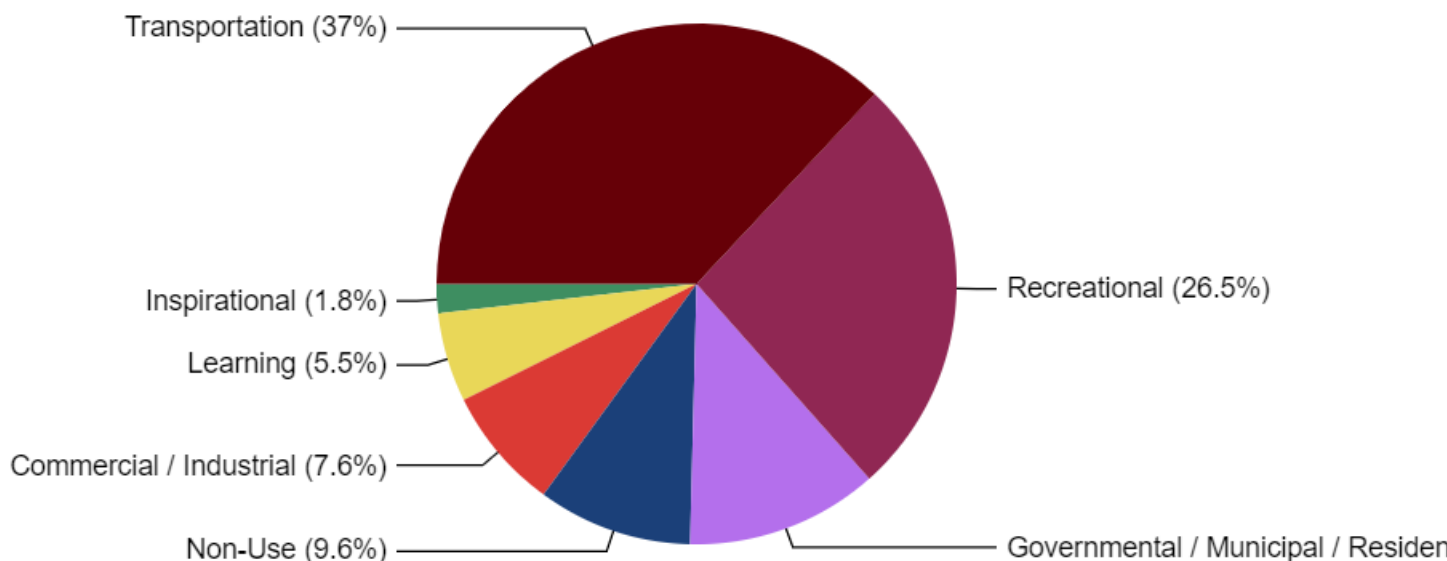


Key Attribute Identification

▸ **Decision makers:**
  ◦ Identify ecosystem attributes of concern for each beneficiary type
▸ **Output:**
  ◦ Prioritized set of environmental attributes, weighted by the relative priority of each beneficiary group

## Categorized list of attributes

- Water
- Atmosphere
- Soil & substrate
- Natural materials
- Flora
- Fungi
- Fauna
- Composite and Extreme Event

Select a Beneficiary Group

Transportation ▼

Select Attributes

| Atmosphere | Soil | **Water** | Fauna | Flora | Fungi | **Other Natural Components** | **Composite (and Extreme Events)** |

| Attribute Tier 1 | Attribute Tier 2 **Show Definitions** | Transportation | |
| | | Transporters of Goods | Transporters of People |
| Beneficiary Result | | 17.67 | 19.32 |
| Water | Water Quality | | |
| | Water Quantity | 80 | 70 |
| | Water Movement | 20 | 20 |
| | Sounds | | |
| | Scents | | |
| | Viewscapes | | 10 |
| | Phenomena (e.g. Sunsets, Northern Lights, etc) | | |

**Screenshot from tool – user input attribute step**
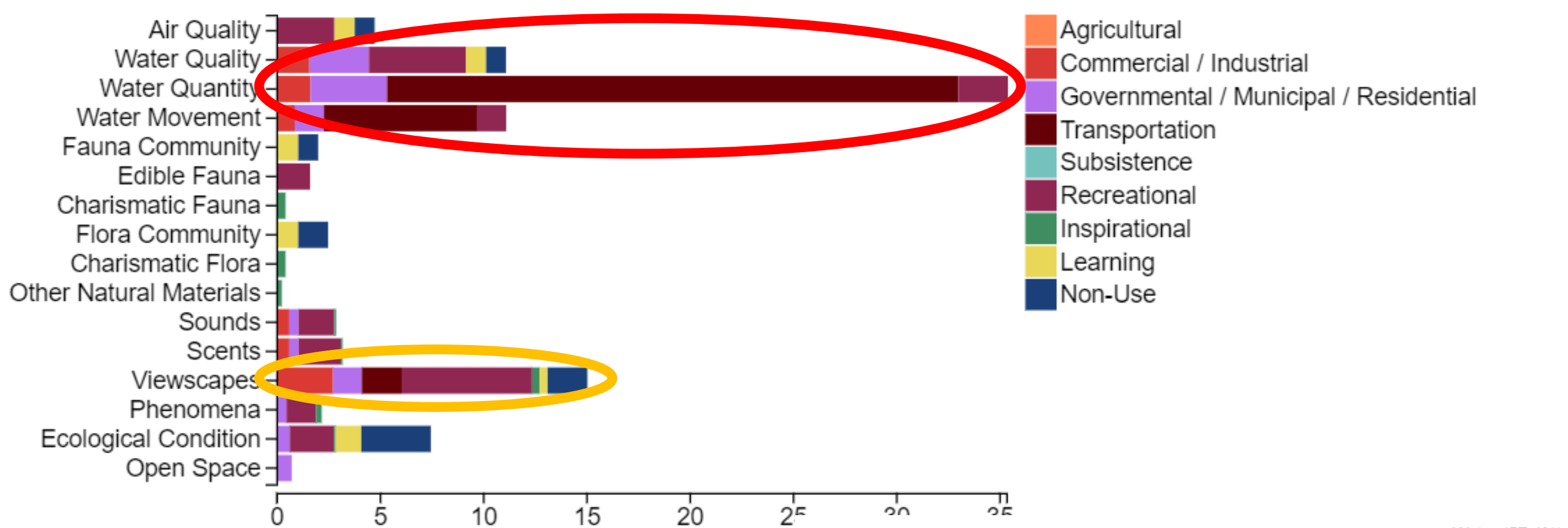
- Bar chart shows relative priority of different environmental attributes and the beneficiaries who value them

- Pie chart shows relative representation of attribute categories
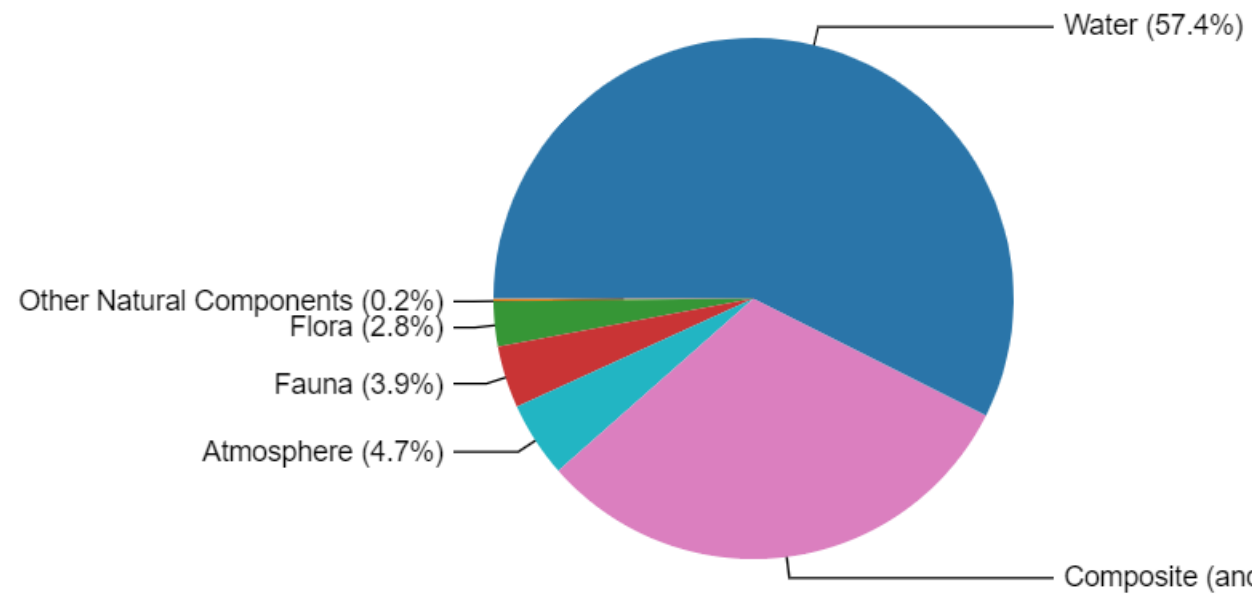
# Applications

- To identify ways in which stakeholders could benefit from a project
- To find common interests among stakeholder groups
- To identify goals and metrics for restoration or remediation sites
- To identify ecosystem services for consideration in land use decisions
- To explicitly lay out an understanding of the stakeholder context and have an opportunity to correct misconceptions

# FEGS Scoping Tool Applications

# Tool Applications... So Far

- To date, tool use has been primarily in the hands of ORD researchers

- The tool was publicly released in June 2021

- This webinar is the first major opportunity to share the tool widely

- ORD has been using the tool in a variety of contexts and sharing the results with stakeholders

# Quantifying Benefits for Program Managers



https://en.wikipedia.org/wiki/Chesapeake_Bay

**Quantify benefits associated with best management practices (Chesapeake Bay)**

- Chesapeake Bay Program was looking to encourage adoption of best management practices by upstream landowners
- To encourage this, they aimed to demonstrate the direct benefit of these activities

- **Why use the Scoping Tool?**
  - The tool was used to identify and prioritize ecosystem services most relevant to upstream stakeholders
  - Limited resources were available and managers wanted to focus the effort of those ecosystem services that were impacted by the best management practices of interest and meaningful to the landowners they hoped to influence

# Quantifying Benefits for Program Managers



- **How was the Scoping Tool used?**
  - ORD researchers conducted a document analysis to provide an initial set of tool inputs
  - Results were discussed with state, federal, academic, NGO scientists and local governments and their feedback was incorporated

- **Result:**
  - The effort led to a priority set of ecosystem services and clear connections between stakeholders and services of interest

- **Tool Impact:**
  - Generated a priority list of most relevant ecosystem services, will be used to identify metrics and model changes
  - First step to incorporate ecosystem services into existing program tools to compare and communicate upstream benefits

# Holistic Evaluation of Restoration Projects



https://www.natfinn.com/the-other-coast/

**Retrospective and prospective analyses of estuarine restorations (Pacific Northwest)**

- Tillamook Estuary Program managers assessed whether use of the Scoping Tool would be of value to the program and their consideration of restoration projects
- Potential utility for communications as well as identifying metrics to assess the effectiveness of restoration efforts

- **Why use the Scoping Tool?**
  - The structured approach and the stakeholder-centered starting point are an alternative approach to considering projects
    - Interest in how the tool's results compare with initial project goals
    - Interest in identifying overlooked stakeholders or benefits
    - Interest in finding commonalities across stakeholder groups

# Holistic Evaluation of Restoration Projects



https://stateparks.oregon.gov/index.cfm?do=park.profile&parkId=191

- **How was the Scoping Tool used?**
  - Retrospective application:
    - ORD researchers provided initial results based on publicly available information
    - Managers provided detailed feedback to refine results
  - Prospective application:
    - Managers provided all inputs based on community knowledge
    - ORD researchers provided support and facilitation in tool application
- **Result:**
  - Prioritized beneficial uses and ecosystem services for each site
  - A comprehensive beneficiary profile capturing all potential benefits of interest
- **Tool Impact:**
  - Identification of potentially overlooked community benefits
  - Communication messages based on common interests across stakeholder groups

# Tool Limitations

- No mechanism to ensure all stakeholders have been identified and included
  - Transparency in use allows for opportunities to correct omissions, but initial inclusion relies upon user(s) knowledge
- Results cannot be compared across applications
  - Each prioritization will be unique to its decision context
- Beneficiaries and environmental attributes language is not always how uses and services are described by people
  - The language could be an obstacle for some users, but it also provides a connection to other EPA tools

# Key Points

- Helps identify and prioritize stakeholders, beneficiaries, and environmental attributes

- Used in the scoping stage of community-level decisions

- Intended users are community-level decision makers, but applications are very flexible
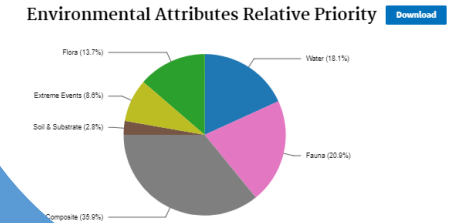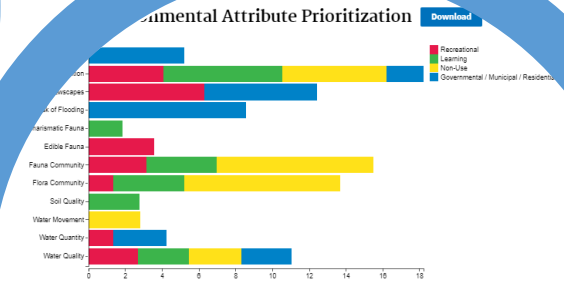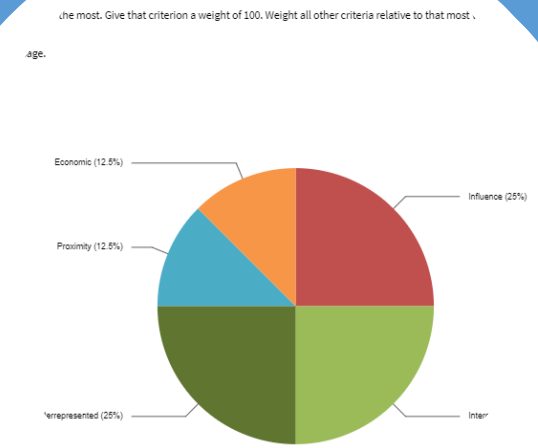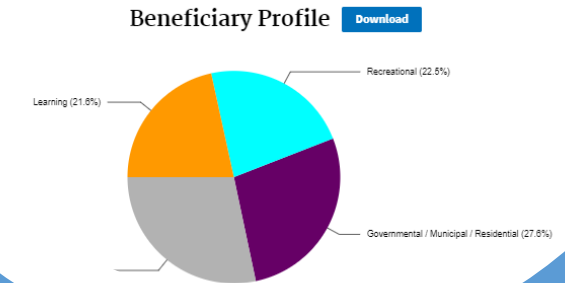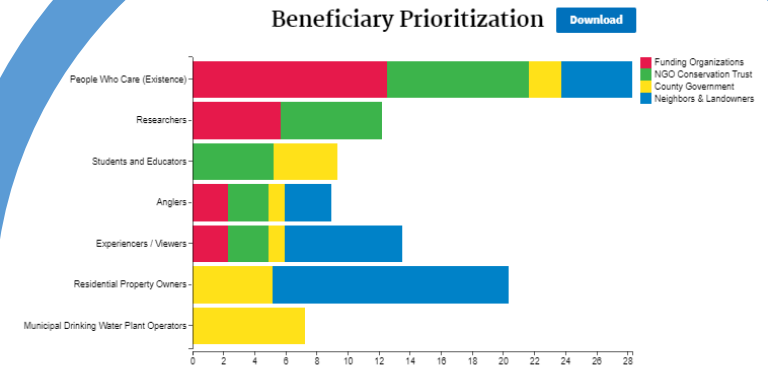
# Resources

- Publicly available tool and user manual:
  - https://www.epa.gov/eco-research/final-ecosystem-goods-and-services-fegs-scoping-tool
- Journal article on prioritization criteria:
  - Sharpe, L. M., Harwell, M. C., & Jackson, C. (2021). Stakeholder prioritization for environmental management. Journal of Environmental Management (https://pubmed.ncbi.nlm.nih.gov/33413974/)
- Book chapter on tool:
  - Sharpe, L., Hernandez, C., & Jackson, C. (2020). Prioritizing stakeholders, beneficiaries and environmental attributes: A tool for ecosystem-based management. In T. O'Higgins, M. Lago, & T. H. DeWitt (Eds.), Ecosystem-based management, ecosystem services and aquatic biodiversity: Theory, tools and applications (pp. 189–212). Amsterdam: Springer.

# Contact

**Please get in touch!**
**We're excited to have people use the tool, eager to get feedback, and available to answer questions!**

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Disclaimer: The views expressed in this presentation are those of the authors and do not necessarily reflect the views or policies of the US EPA.

# Collaborators

| Tool development | Integration with other ecosystem services work in EPA | Use Cases |
|---|---|---|
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