Virtual Ecosystem Scenario Viewer (VES-V): A new tool for visualizing marine ecosystem models

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Take Away Points

• Marine Ecosystems are complex
• Understanding and communicating about them can be difficult, but important, so that we can make wise choices.
• Virtual Ecosystem Scenario Viewer (VES-V) is a tool to aid in communicating ecosystem info.
• Useful tool for online learning or as a virtual exhibit.
• Feedback, suggestions - any scenarios or data you want us to visualize.

Awareness and use

- Virtual Ecosystem Scenario Viewer (VES-V) is a tool to aid in communicating ecosystem info.
Need for Ecosystem-Based Fisheries Management

Ecosystem-Savvy Resource Management

- 117 Marine Mammals
- 11 LMEs
- 100 + NEPA actions
- 8 93 ESA species
- 2000+ Habitat Actions
- 200+ Aquaculture actions
- 450+ Fisheries

Observations & Data
Research & Modeling
Synthesis & Assessment
Management Advice

Management
Need for Ecosystem-Based (Fisheries)
Ecosystems are rich, complex, and dynamic.
Communicating ecosystem interactions/dynamics is difficult. Ecosystem data and model output can be hard to decipher under the hood of models and data.

Need tools to visualize output, engage stakeholders and managers, and compare scenarios.

Table from: Kaplan 2011, in NOAA Tech Memo. 109
Uptake of Ecosystem Info is Difficult

- Fisheries science and management training is often focused on single species/stock dynamics.
- Generally, science education and training has been more focused on reductionism.
- As a result, we are not well prepared for holistic, holistic thinking needs for EBFM.

Source: https://xkcd.com/435/
Software for Visualizing Ecosystem Information

- Versions available for PC, Mac, Linux, and now online
- Visualizing a wide range of data:
  - Time series of (relative) abundance from models, surveys, stock/PR assessments (simple CSV inputs)
Need to improve how we communicate ecosystem data of ecosystems. Visualizations and interactive media can help.

- (not primarily scientists)
- Educators, students, etc.
- Future scientists, manager and stakeholders
- Managers and stakeholders

Ensure uptake of the info for:

Who is the audience for VES-V?
DEMO (~20 minutes)
Initial Settings Splash Screen
Dive in - Hawaiian Islands - Pacific Coral
Sting Rays
Massive Corals
Pelagic
Pelagic - Base vs High Fishing - Lancetfish
Pelagic - Base vs High Fishing - Mahi Mahi
Choose a region - West Coast

- West Coast

Specific Habitats:
- Kelp Forest
- Rocky Outcropping
- Coral
- Sandy Flats

U.S. West Coast Hotspots:
- Monterey Bay
- Oregon continental slope
- Washington outer continental shelf
- Whole Model Region
Dive in - Whole Model - Sandy Flats
Sandy Base vs 2X Fishing Scope
Sandy - Base vs 2x Fishing - Sardine
Sandy - Base vs 2X Fishing - Anchovy
Sandy - Base vs 0.5x Fishing - Whiting
Choose a Region - Northeast US
Dive in - Mid-Atlantic Bight - Cobble
Sandy - Base vs 2X Fishing - Scope
END OF DEMO
Virtual Ecosystem Scenarios Viewer (VES-V)

Software for Visualizing Ecosystem Information

https://nmfs-ecosystem-tools.github.io/ves-v/
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- Understanding and communicating about them can be difficult, but doing so is important, so that we can make wise choices.
- Virtual Ecosystem Scenario Viewer (VES-V) is a tool to aid understanding and communicating ecosystem info.
- Awareness and use in communicating ecosystem info.
- Feedback, suggestions - any scenarios or data you want us to visualize.
- A useful tool for online learning or as a virtual exhibit.
- Any scenarios or data you want us to visualize.

Virtual Ecosystem Scenario Viewer (VES-V) is a tool to aid understanding and communicating about them can be difficult, but doing so is important, so that we can make wise choices.
Final Point

VES-V is freely available and is ready to be used: https://github.io/VEStools

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Tonalhi Kaplan exploring the Florida Keys while in Seattle.