

Spatial Analysis: Recap of Recent Workshops June 14, 2016

Summary

The state recently held two workshops (May 26 and June 13, 2016) for WCMAC members and others to assist with the next steps on spatial analysis to inform the state's marine spatial planning process.

The purposes of these workshops were:

- To familiarize interested parties with MARXAN tool and potential scenarios
- To gather further input on MARXAN scenarios to:
 - 1) Assist state in preparing the series of maps required by statute, and
 - 2) To assist WCMAC in preparing spatial recommendations for the Marine Spatial Plan.

At the workshops, state staff presented draft scenarios and revised outputs using Marxan and received feedback from participants on data and the model parameters. Scenarios presented included:

- A. **Subsector Scenario** that included data on: fishing, aquaculture, recreation, shipping/transportation, ecologically important areas, and archaeological/historic resources. Intensity of use data was used, where available.
- B. **Sensitive Areas** that included data on: threatened and endangered species, marine mammals, seabird colonies, important habitats, and archaeological/historic resources.
- C. **Important Crab Areas** that included data on: commercial crab fishing and soft-bottom habitat within Special Management Areas and out to a depth of 150 fathoms.
- D. **Combined Scenario** that incorporated all of the above and crabber-tug/tow lanes.

Marxan results were illustrated against energy suitability data for: nearshore wave energy, mid-depth wind, and floating wind technologies and using both clumped and dispersed results. Two types of outputs were illustrated:

1. Meeting an **energy goal** using coarse estimates for energy production per hexagon (specific to technology type). The energy goal was based on anticipated future energy needs, state energy plans and policies, and designed to avoid high use areas within a scenario. This energy goal was based on estimates of potential future development in the 200-500 MW range and using various levels of energy suitability.
2. Using a new **cost-threshold** analysis to find the minimum potential renewable energy footprint that could be achieved without exceeding that cost threshold.

Background:

The Marine Spatial Planning law requires a plan to include a series of maps that identify: "appropriate locations with high potential for renewable energy production with minimal potential for conflicts with other existing uses or sensitive environments" RCW 43.372.040(6)(c)

WCMAC has played an important role in advising on the criteria for the process and recommended actions for the outputs of the Use Analysis throughout the past year, including maps of ecologically important areas and maps of human activities.

The Use Analysis, as outlined by the state, involves the following main activities:

- Assessing and compiling data on existing uses and ecological information in two ways:
 - Intensity of uses – how frequently an area is used

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- Number of uses – how many uses occur in an area, regardless of how often
- Using spatial analysis tools to compare existing use data to renewable energy data
- Developing spatial recommendations

What is Marxan?

Marxan is a software optimization tool that enables spatial analysis of multiple sets of spatial data (GIS or mapped) using different scenarios to produce different options that meet multiple planning objectives. In the case of marine spatial planning, the tool can:

- Include data on human uses, ecological information (e.g. species/habitat) and potential new uses (e.g. renewable energy).
- Identify spatial overlap between existing uses and resources and potential new uses.
- Illustrate areas that avoid and minimize socio-economic and environmental costs, while still achieving various potential targets for new uses such as renewable energy.
- Incorporate stakeholder interests using different scenarios.
- Marxan does not provide a single answer or solution. Different scenarios reflecting different weightings of use data and different energy type will result in different results.

Marxan was originally developed in and used by Australia for marine conservation planning efforts and has since been used in a variety of coastal and land planning applications around the world. Marxan can be a useful tool for WCMAC to illustrate various scenarios and to support WCMAC's subsequent consideration of and development of spatial recommendations.

Discussion/Next Steps:

Participants discussed many topics at the two workshops, including:

- Questions and comments about data included in the scenarios and data quality.
- Challenges of imperfect data and of analyzing impacts without a specific proposal.
- Challenges of interpreting maps and describing map outputs.
- Challenges of comparing impacts to multiple uses versus impacts to a single use, recognizing that a large impact to a single use may be more significant than small impacts to a variety of uses.
- Benefit of using the data we have and using an objective tool like Marxan.
- The need for more focus on developing narrative recommendations.
- That more specific analyses of potential impacts can and will be done when a specific project is proposed.

The group discussed further fleshing out concepts for potential spatial recommendations, including:

- Identifying areas that are particularly valuable and vulnerable, and developing appropriate recommendations for these areas.
- Developing recommendations for ongoing data collection and updates as appropriate, and developing recommendations requiring applicants to gather and analyze other data.
- Developing recommendations regarding the scale of projects and potential cumulative impacts from multiple projects.