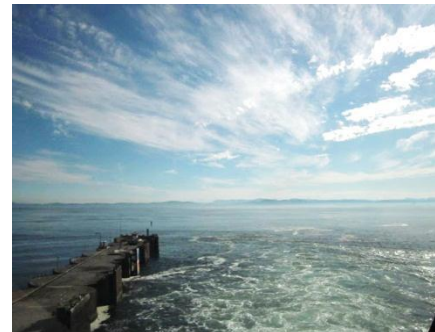
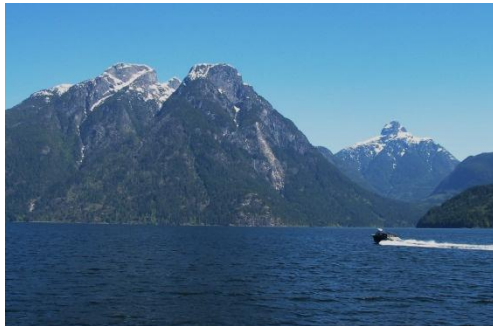


West Coast Vancouver Island, BC

A Collaborative Approach to Marine Spatial Planning

Vancouver Island is known for its stunning landscapes, rich cultural heritage, and dynamic geological features. Stretching 460 km along the Pacific Ocean, the shoreline includes diverse coastal ecosystems from sandy beaches to rocky shores to sheltered inlets and rugged coastal mountains. The coast's varied natural features provide services that regulate ocean processes, protect habitats and food sources, and support human well-being on one of Canada's most populous islands. The region is home to thousands of fish, bird, plant and animal species, and to local communities of people that rely on these resources for sustenance and livelihood.

In spite of the natural beauty of the area, the Vancouver Island ecosystem faces great challenges. Salmon populations have decreased dramatically in recent years and levels of toxins in local food sources are abnormally high. Important industries such as logging, transportation, and aquaculture put pressure on the system and bring risks, and there is discussion about the costs and benefits of efforts to increase local renewable energy sources through the development of wave energy facilities.



Results

■ **Trained Professionals in InVEST software:** We designed marine InVEST models according to the needs of our partner, West Coast Aquatic, government objectives, and the values of indigenous communities, and trained them to run the models themselves. With local planners and stakeholders in the driver's seat, marine InVEST mapping will inform decisions with direct impact on marine ecosystems and encourage transparent resource management.

■ **Produced multi-scale Scenario Maps for Marine Spatial Planning:** Local zoning maps provided realistic and meaningful scenarios for local populations. For larger-scale planning questions, West Coast Aquatic is using outputs from marine InVEST, together with other information, to compare a wide range of valued metrics across various management scenarios under consideration.

Developed New InVEST Models:

- Food from Fisheries
- Food from Aquaculture
- Coastal Protection
- Renewable Energy
- Aesthetic Quality
- Recreation & Tourism
- Marine Carbon
- Marine Water Quality
- Marine Habitat Risk

New Marine InVEST models make Coastal Marine Spatial Planning practicable and inclusive to stakeholders

InVEST facilitates the incorporation of nature's benefits and local priorities into resource management. Our first real-world test-case for marine InVEST was informing marine spatial planning on the west coast of Vancouver Island. Thus, most of the marine InVEST models were shaped and refined through an iterative process from computer lab to real-world and back again. Marine InVEST models analyze ecosystem benefits from coastal environments under spatially explicit scenarios of human use. Outputs quantify protective services offered by nature to coastal populations, show areas where diverse benefits are produced, and can be used to explore trade-offs between and among different benefits.



Marine InVEST informs Marine Spatial Planning by assessing the condition of ecosystem services under varying scenarios and is helping to produce options amenable to multiple stakeholders. Marine InVEST can enhance collaborative decision-making by exploring how many things people care about might change under different management scenarios.



Life Support Systems

■ **Seafood:** The west coast of Vancouver Island is known for its salmon, shellfish, and herring fishing areas. InVEST's fisheries and aquaculture models are helping to explore how local seafood supply might be affected by different management alternatives.

■ **Recreation & Tourism:** Vancouver Island is a hub for outdoor activities such as world-renowned backpacking, whale watching, kayaking, and surfing. InVEST is helping to explore how changes in marine habitats and tourism infrastructure may change visitation rates.

■ **Coastal Protection:** Coastal habitats such as seagrass beds and marshes dampen the power of waves and reduce erosion and flooding. InVEST's coastal protection models map areas vulnerable to coastal hazards and quantify the protective role played by natural habitats.

■ **Cultural Services:** The First Nations and other residents of Vancouver Island value the scenic beauty and cultural significance of their coastal resources. InSEAM can map important cultural and historical areas; InVEST can explore how alternate management schemes affect their scenic vistas.

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Marine Spatial Planning: West Coast Vancouver Island

The Natural Capital Project applied marine InVEST models on the west coast of Vancouver Island, British Columbia, Canada in partnership with West Coast Aquatic, a regional public-private management body for aquatic resources. We are collaborating with West Coast Aquatic to inform marine spatial plans in Barkley and Clayoquot Sounds. Our partnership hopes to create options agreeable to all levels of government, First Nations, coastal communities, and private entities.



There is an emphasis on balancing industrial and commercial interests (e.g., shipping, mining, logging and aquaculture), developing tourism, recreation and renewable energy generation, and accommodating a cultural desire to sustain the peace and quiet, scenic beauty, and quality of life on the west coast of Vancouver Island. InVEST models are helping to answer questions such as:

- Which regions are suitable for different activities?
- How would alternative spatial plans affect a range of ecosystem services?
- What marine-use conflicts will arise, and how can they be mitigated?

Scenario Maps in Lemmens Inlet, BC

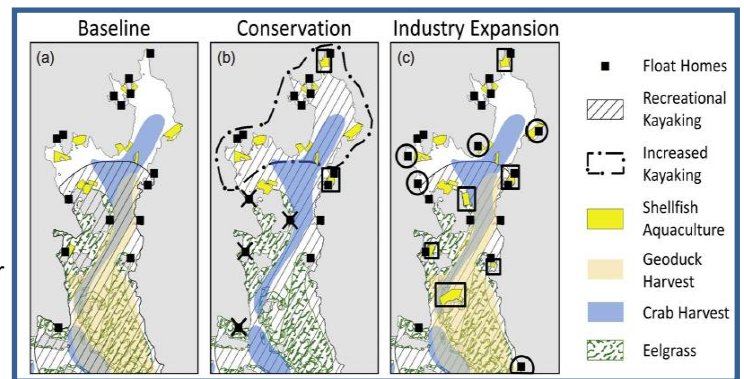
West Coast Aquatic used stakeholder interviews to identify and map local visions for development. To facilitate an inclusive process on the west coast of Vancouver Island, we used the Natural Capital Project's new online mapping tool, InSEAM, to enable collaborative map editing in real time. Below, three alternative management scenarios are shown for Lemmens Inlet:

Baseline: No changes to current uses or zoning;

Conservation: Restricted float homes and aquaculture near eelgrass beds;

Industry

Expansion: Float home leases and oyster tenures are added, and geoduck harvest is permitted.



The maps offer options that bolster aquaculture and infrastructure, while avoiding threats to natural habitats, and retaining their ability to continue to provide diverse benefits to the local community. These maps are helping to reduce conflicts within stakeholder discussions by demonstrating that careful siting of some controversial activities could reduce environmental impacts.

Future Directions

Ecosystem service modeling results for scenarios - like those of Lemmens Inlet - have informed early iterations of marine plans for the west coast of Vancouver Island and will inform the creation of the final plan in 2012 or 2013. The region's integrated planning process illustrates how InVEST can be used to shape dialogue on marine spatial planning, inform decisions, and help bring more voices to the decision-making table.