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Supporting Sustainable Offshore Wind Energy Development for the State of California

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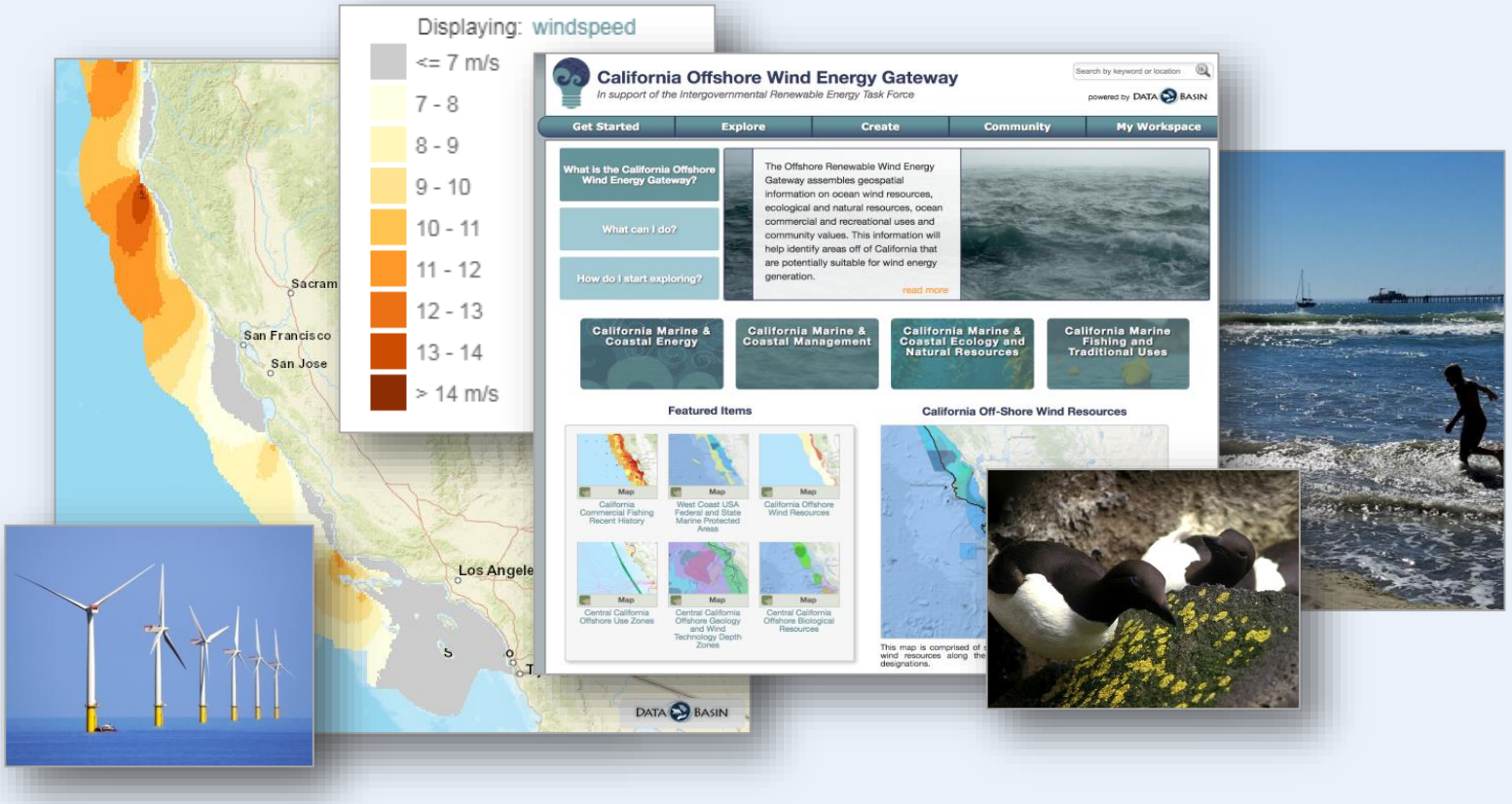
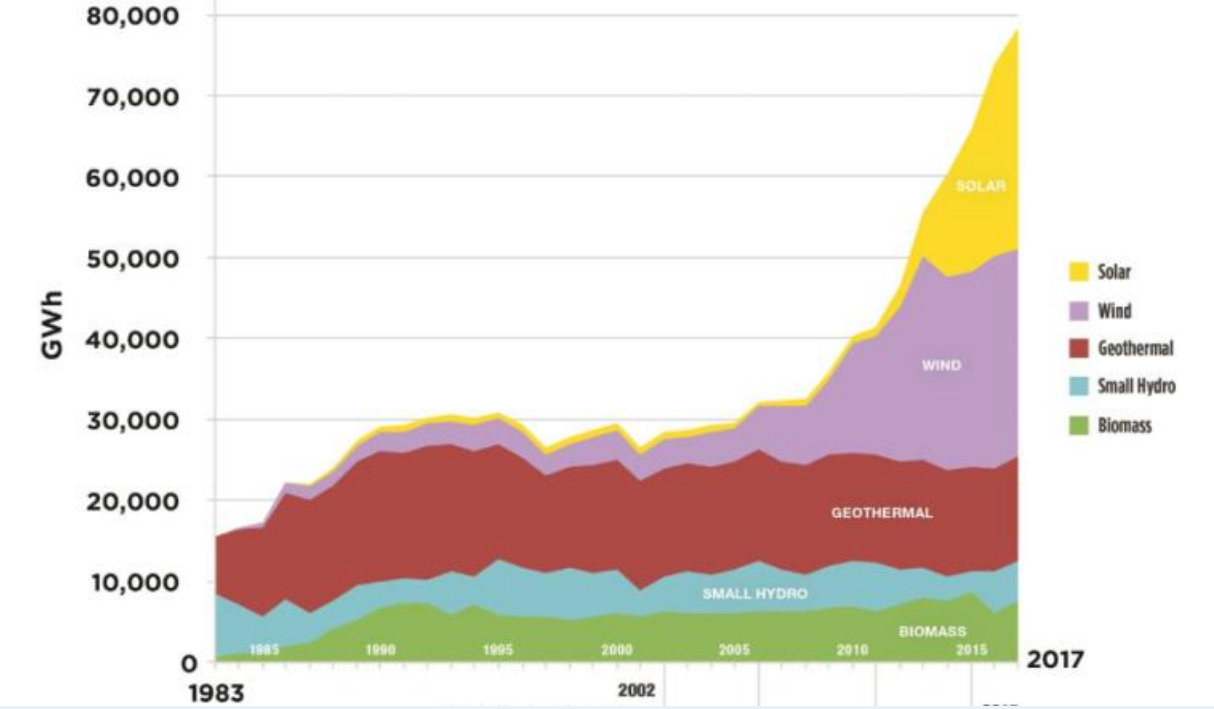


The State of CA is addressing climate change

- Investment in sustainably-sound renewable energy planning
- Use of science-driven tools to inform decision-making

Examples (in partnership with CBI):

1. California Climate Console, http://climateconsole.org/
2. California Energy Infrastructure Planning Analyst (CEIPA)
3. DataBasin.org "Gateways", to support public review and sharing of data



BOEM / California Intergovernmental Renewable Energy Task Force

What is the BOEM/California Intergovernmental Renewable Energy Task Force?

The BOEM/California Intergovernmental Renewable Energy Task Force ("Task Force") is a partnership of members of state, local and tribal governments and federal agencies created in 2016 that provide critical information to the decision-making process for planning future offshore renewable energy development opportunities in federal waters offshore California. The Task Force is seeking to identify potential areas in federal waters that may be suitable to lease for offshore renewable energy development. It serves as a forum to:

- Discuss stakeholder issues and concerns;
- Exchange data and information about biological and physical resources, ocean uses and priorities; and
- Facilitate early and continual dialogue and collaboration opportunities.

Get more information and Join the Offshore Renewable Energy List Serve on the California Energy Commission website at: http://energy.ca.gov/renewables/offshore_energy/

Track Task Force progress on the BOEM website at: https://www.boem.gov/California/

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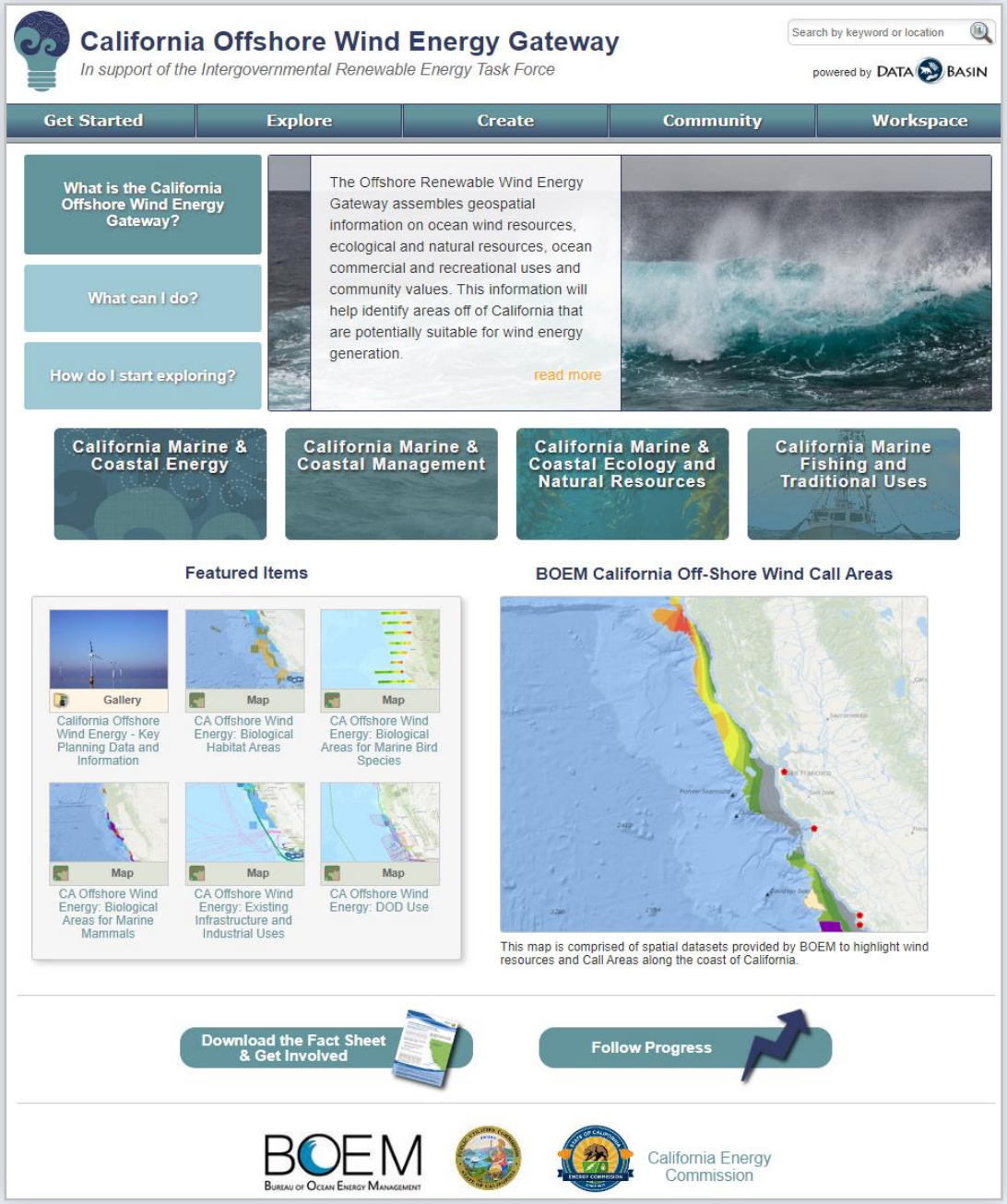

Link: https://caoffshorewind.databasin.org/

1. Authoritative place for spatial data supporting the Task Force in identifying areas suitable for wind energy generation

2. Archive of geospatial information on ocean wind resources, ecological and natural resources, commercial and recreational uses, and community values

3. Data was collected via participatory process w/ stakeholders & experts.

4. Curated “Galleries” hold collections of thematic data, organized in folders.

5. CBI’s Data Basin platform allows stakeholders to access, view, map, and contribute data.

6. Data Basin supports collaboration (public and private groups/data) and integration with decision-support tools.

As renewable energy development increases, it's crucial to synthesize scientific and geospatial information to minimize environmental impacts and conflict with existing human uses.

An Accessible Solution

In consultation with other scientists, regulatory agencies, and representatives of NGOs and industries, we will compile data into meaningful information to enable the State to assess potential tradeoffs and benefits of renewable ocean energy.

Implementation

- Identify critical data from the wealth of information available
- Develop science-driven decision-support models
- Provide a transparent analysis framework
- Share results online to allow for interactive exploration of maps
- Deliver comprehensible outputs to decision makers

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CBI's Analysis **Overview**:

1. Acquire updated key data sets & document data gaps.
2. Synthesize available data to identify areas that maximize energy generation potential while preserving existing ocean uses and protecting the marine and coastal environments.
3. Perform EEMS modeling to highlight potential conflicts & planning considerations across waters off the coast of CA (in and outside of existing call areas).

CBI's Analysis **Outcomes**:

1. Highlight areas with maximum energy production benefit and least impact on established ocean uses & biodiversity.
2. Make results accessible by integrating them into transparent decision-support tools, e.g. the CA OSW Gateway, California Energy Infrastructure Planning Analyst (CEIPA), EEMS Online.
3. Allow stakeholders, decision-makers, and the public to examine features of interest in online interactive maps.

Analysis Themes & Input Data:

Environmental Considerations

Marine Mammals

Cetaceans
- Whales
- Dolphins

Pinnipeds
- Seals
- Sea Lions

Mustelids
- Sea Otters

Airborne Species

- **Seabirds**
- Shore Birds
- Bats
- Collision and Displacement Vulnerability

Other Species

- **Turtles**
- Sharks
- Other Fish
- Invertebrates

Add. Elements

- **Benthic Habitat**
- **Prey Base**
- **Migration**
- Estuaries

Potential Data Inputs

Analysis Themes & Input Data:

Renewable Energy Implementation

Infrastructure Considerations

Ocean Use

Cultural Resources

Physical Constraints

Potential Data Inputs

Marine:
- Underwater Cables
- Oil and Gas Pipelines
- Artificial Reefs, Buoys, and Other Structures
- Navigational Hazards

Coastal:
- Energy Demand
- Power Plants
- Power Grid

- Ship Traffic
- Ports
- Fishing Industry
- Aquaculture
- MPAs
- Federal, State, and Local Agencies

- Tribal Resources
- Shipwrecks
- Historic Resources
- Recreation
- Community Values

Prevailing Winds:
- Speed and Direction

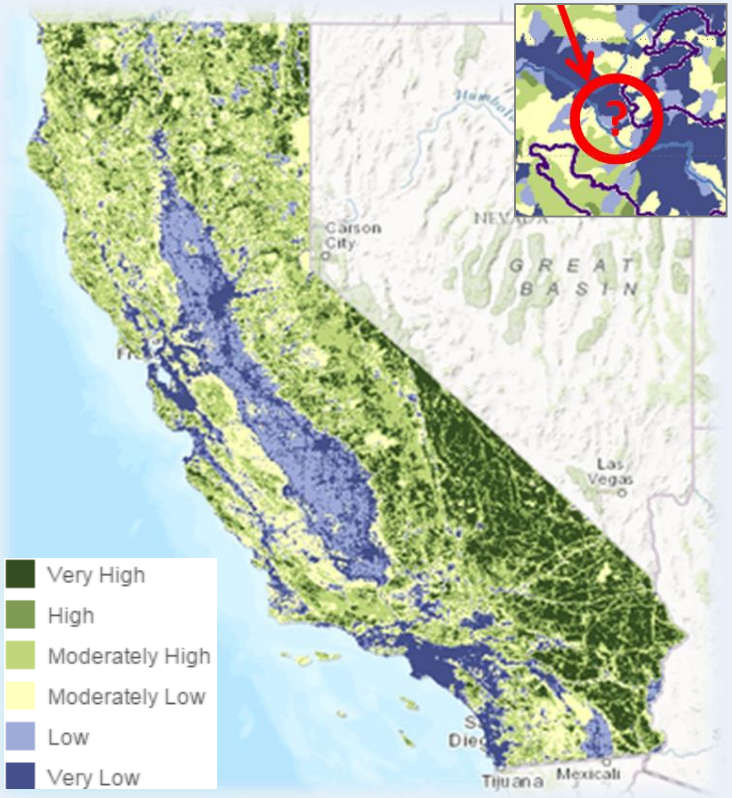
Ocean Floor:
- Depth
- Contour
- Substrate

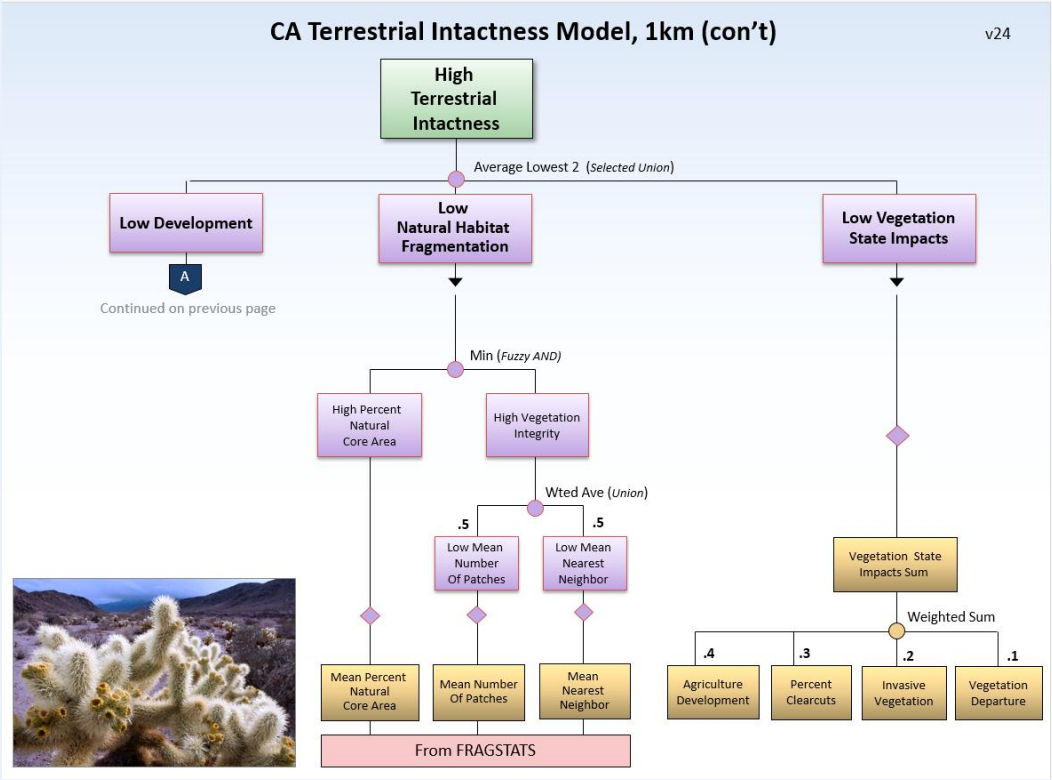
Natural Hazards:
- Seismic Activity
- Tsunami Risk

CBI EEMS Modeling **Background**

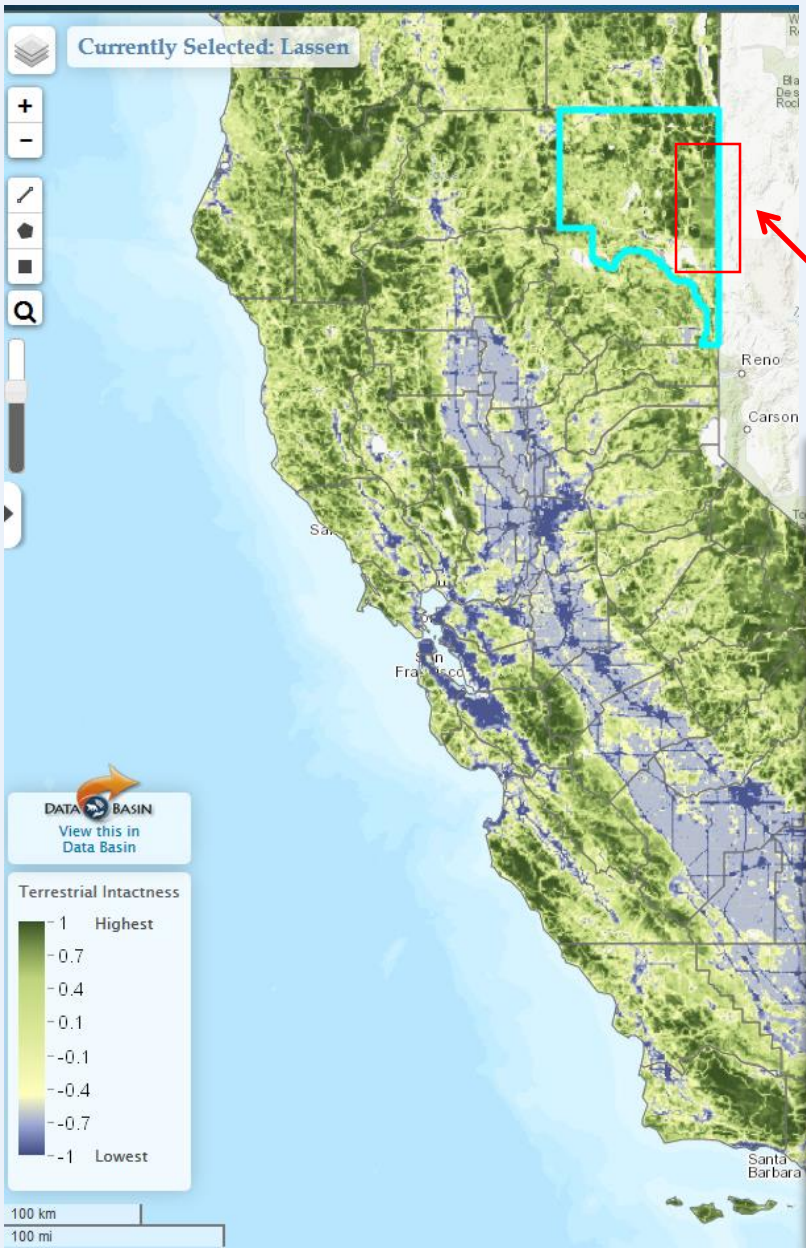
Environmental Evaluation Modeling System (EEMS) allows different types of **data to be combined to answer complex questions** and **create a transparent decision-making system**.

- **EEMS logic modeling** facilitates scientifically-sound decision-making.
- **Allows integration of diverse types of data** into a transparent decision-support tool.
- **Online interactive map** will show considerations of interest to OSW development & their combination.

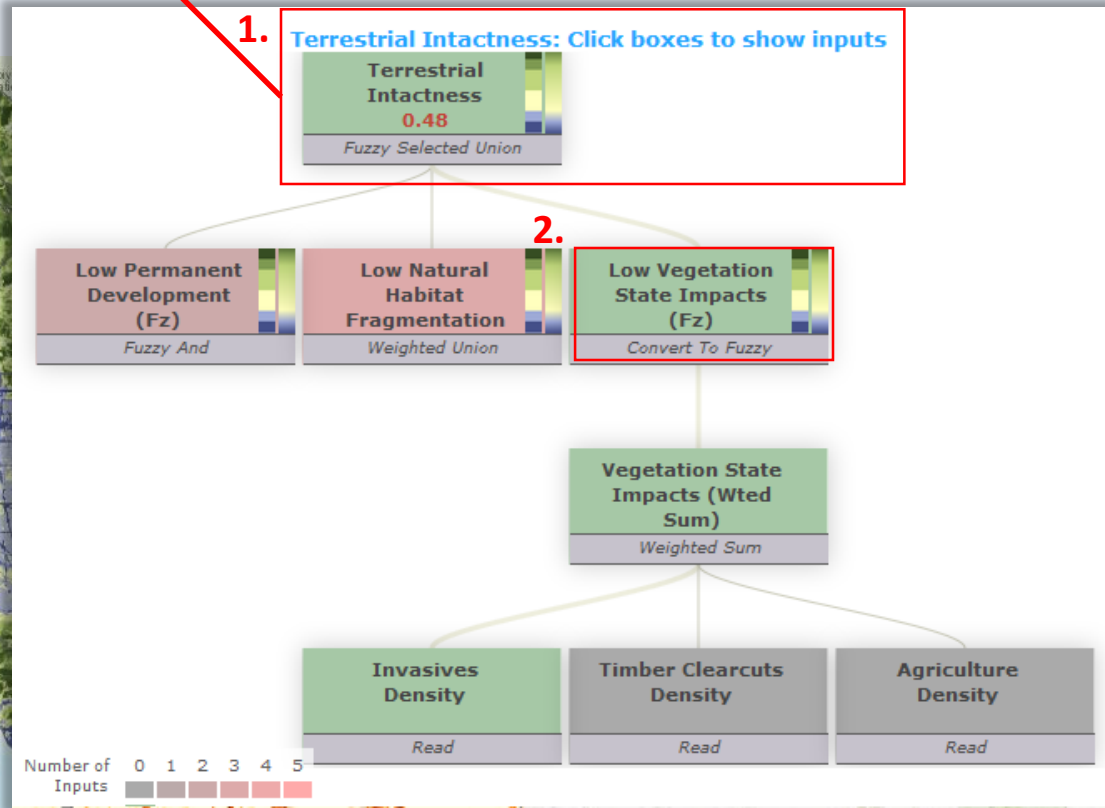




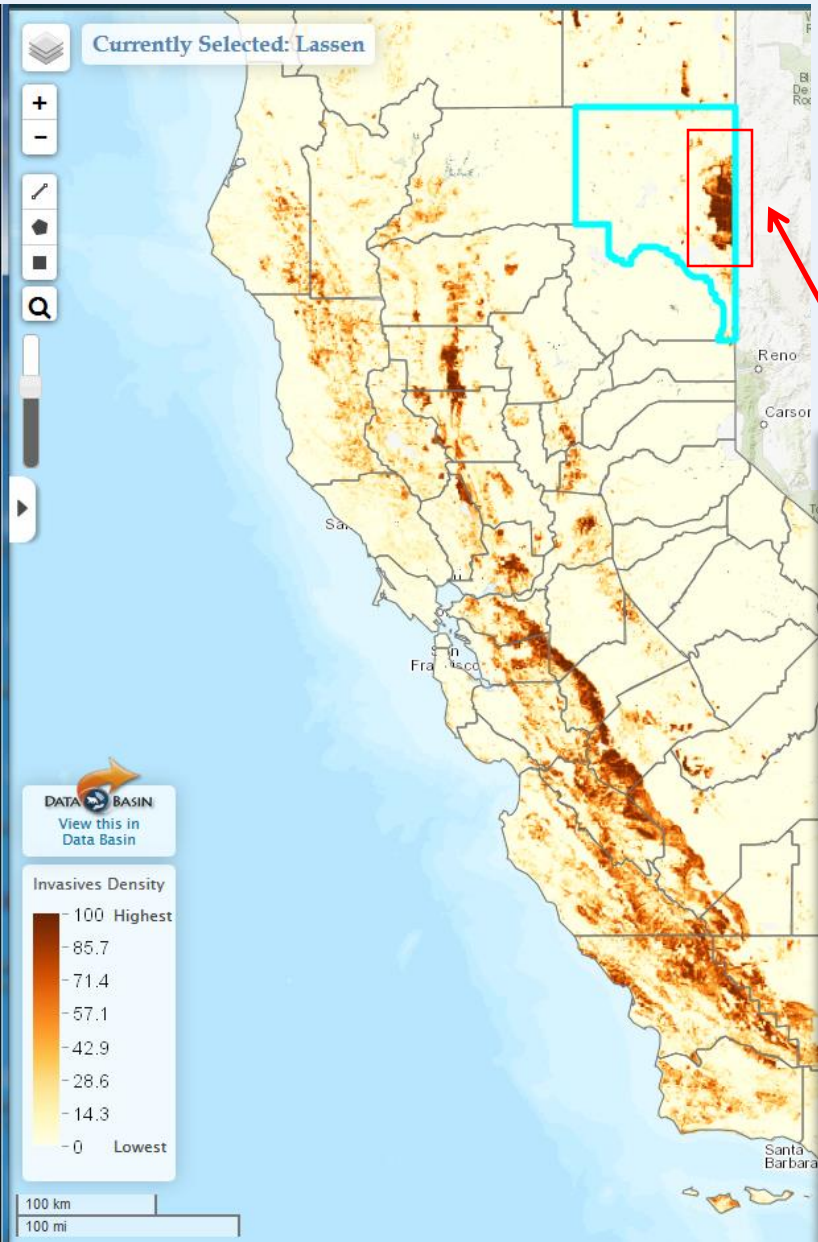
CBI EEMS Modeling **Mapped Visualization**



Drilling down in the analysis layers helps the user understand the underlying causes of the ratings.



CBI EEMS Modeling **Exploring Influences**



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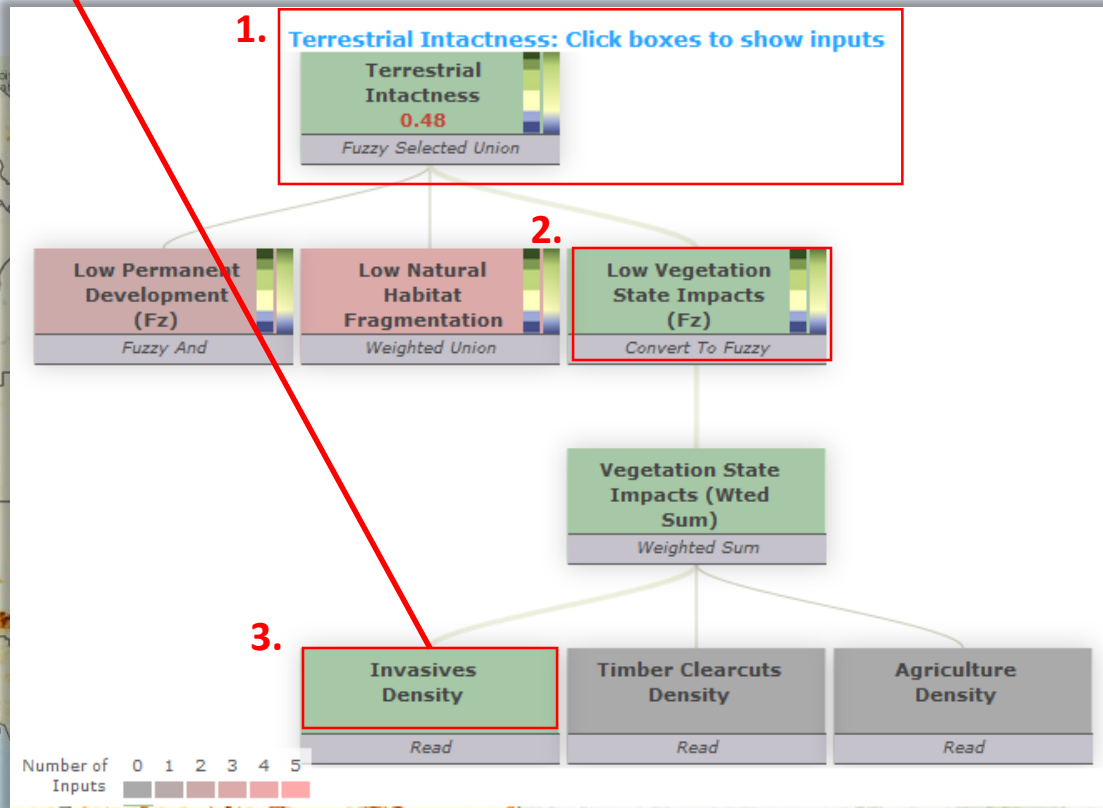

Complementary work yields robust results

1. Given the data gaps and uncertainties that exist for available marine data to be used in the planning process, having multiple approaches and multiple lines of scientific evidence is critical to robust decision making.
2. Point Blue's optimization model results can be used as inputs to CBI's EEMS models, a means of calibrating our models, or an avenue for assessing outcomes.

Prepare Data: Synthesize and summarize to reporting units

Create Model: Structure, logic operators, weighting

Examine Output: Modify based on expert & user input

Summary of CBI's **Project Goals**

1. Serve credible and useful information to a diverse group of stakeholders.
2. Support the State's work in identifying target areas for development, monitoring, protection, mitigation.
3. Allow stakeholders to explore analysis results in combination with useful contextual data, already online or uploaded by users, e.g. examine characteristics of a potential development footprint (Industry) or conservation area of interest (NGO).
4. Compile spatial data to facilitate scientifically-sound decision making.

The Path Forward

The Conservation Biology Institute's flexible analysis approach provides a baseline that sets the stage for robust planning by the State:

1. Analysis and composite maps of environmental considerations can be used by the Ocean Protection Council for non-offshore wind marine planning applications, too.
2. Work acts as a foundation for additional analysis.
   - Future stages could be tailored particular species concerns, regulations, or regional perspectives.
   - Climate change considerations could be added, e.g. to highlight areas that may act as climate refugia for marine species.

Learn More & Participate

1. Check out the **California Offshore Wind Energy Gateway**: https://caoffshorewind.databasin.org/
2. Visit **DataBasin.org & create an account** – The Conservation Biology Institute's web-based, scientific mapping & analysis platform
3. **Join the CEC's working group!**

Thanks so much to our funders

OCEAN PROTECTION COUNCIL

STATE OF CALIFORNIA ENERGY COMMISSION

CALIFORNIA ENERGY COMMISSION

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