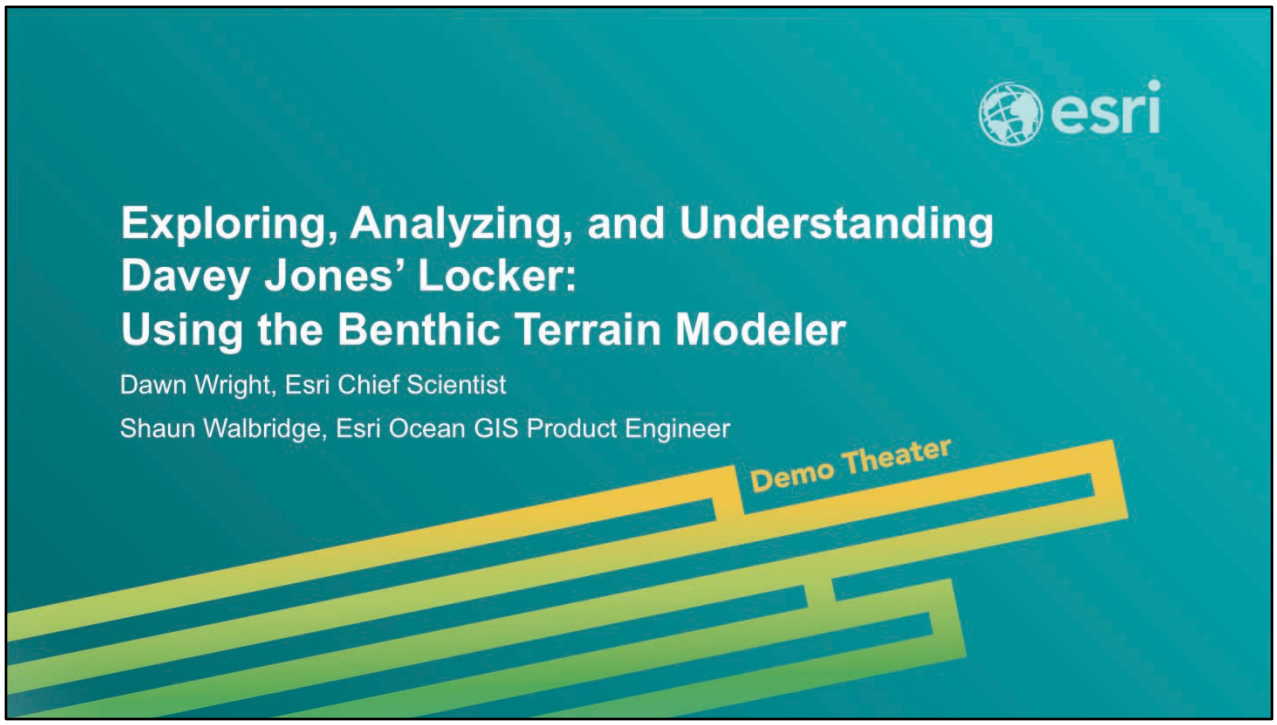
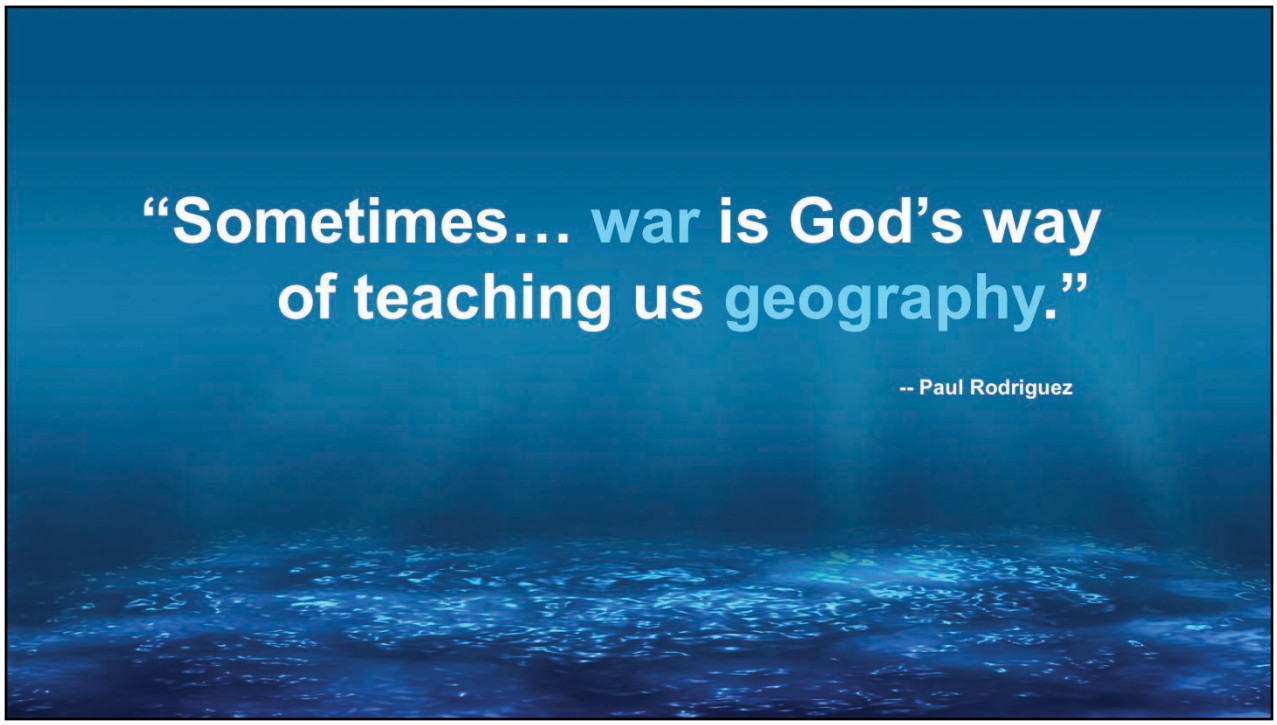
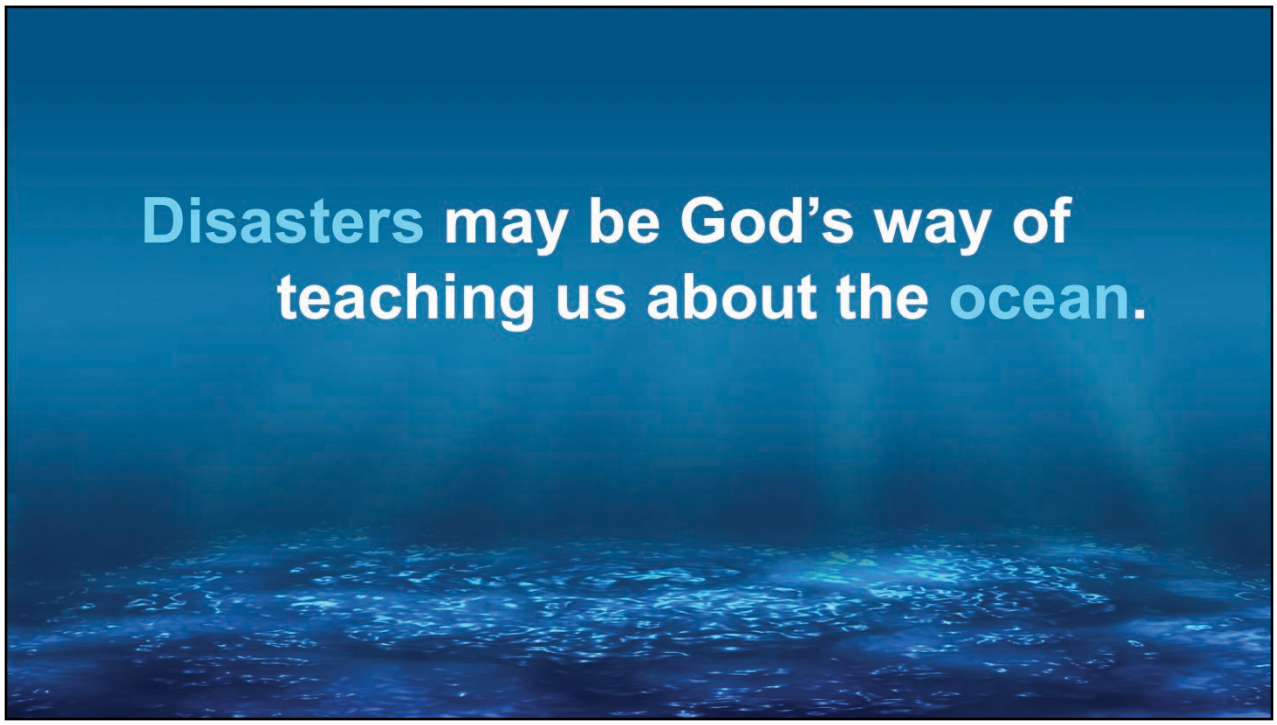
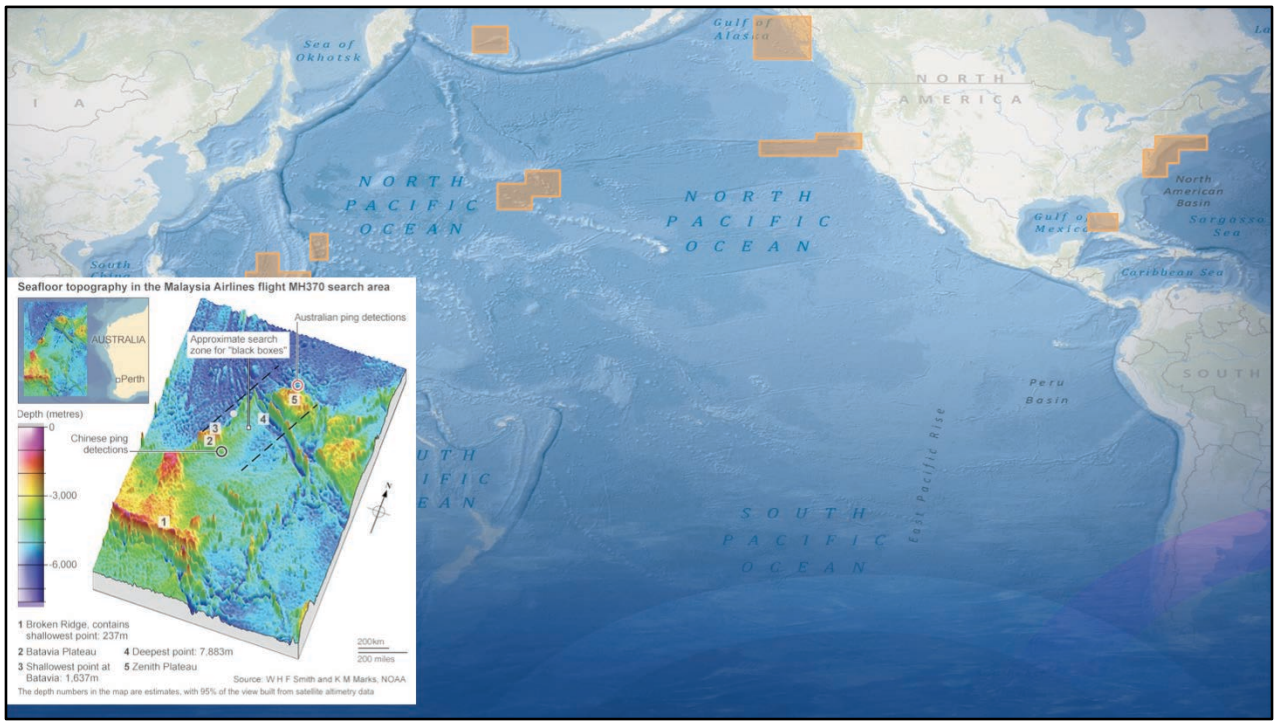

esri
Exploring, Analyzing, and Understanding
Davey Jones' Locker:
Using the Benthic Terrain Modeler
Dawn Wright, Esri Chief Scientist
Shaun Walbridge, Esri Ocean GIS Product Engineer
Demo Theater



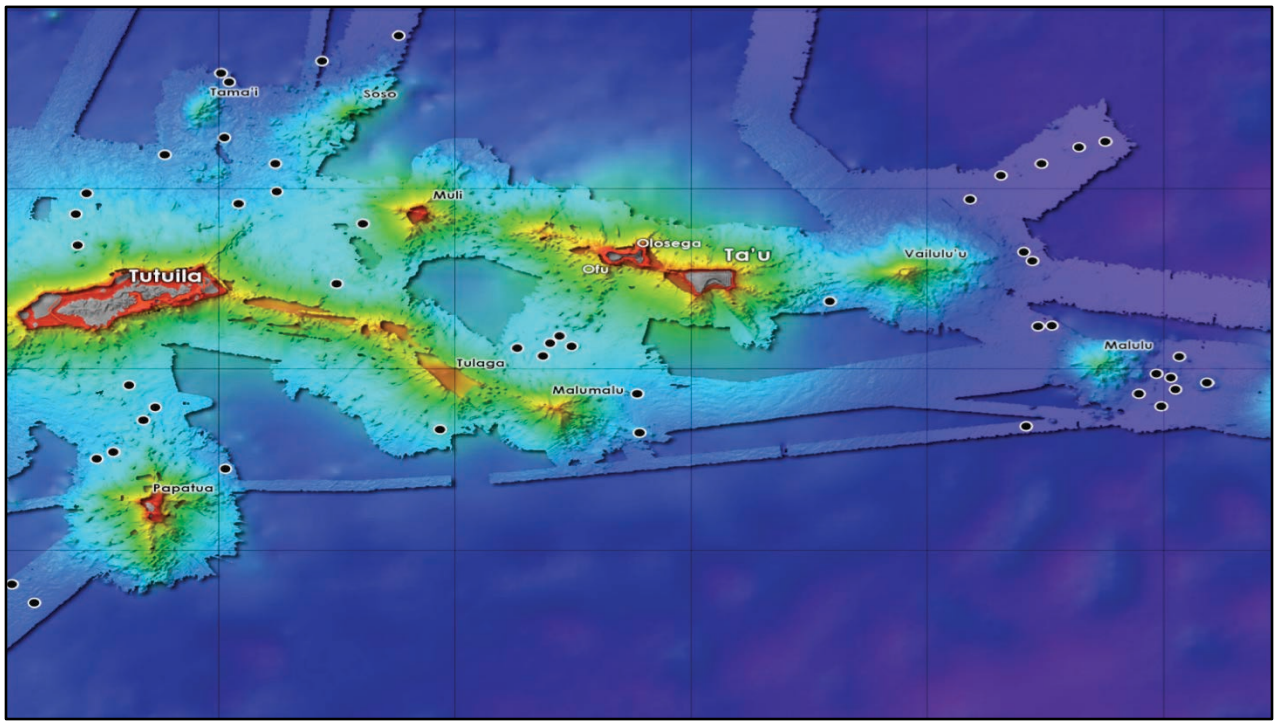
The comedian Paul Rodriguez is credited with saying: "Sometimes I think war is God's way of teaching us geography."



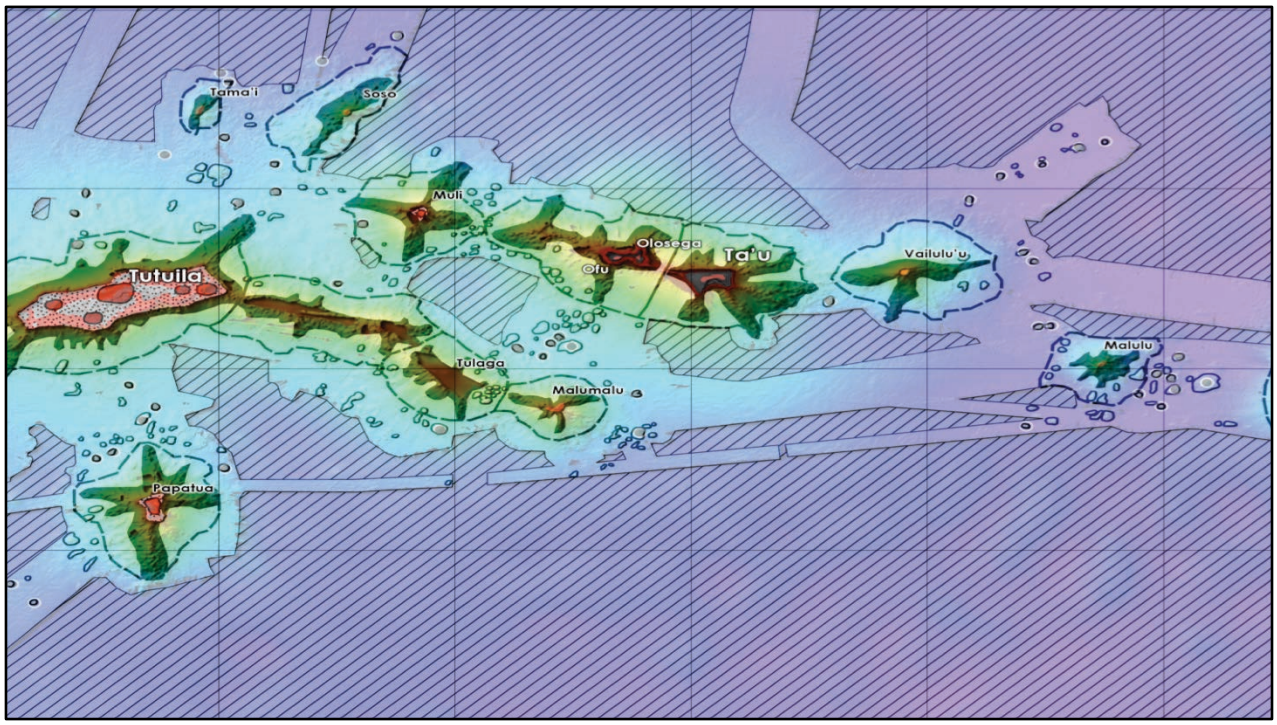
As a corollary, disasters may be God's way of teaching us about the ocean. Events such as Hurricane Sandy, the Japanese tsunami, and now the ongoing search for MH 370 have certainly peaked the interest of many in not only how the oceans work, but how the oceans are mapped, and now perhaps to the great importance and legacy of some of that data!



we know with GIS on land, we build upon is topography and in the oceans it is bathymetry. The Esri ocean basemap project continues to use // the world's most authoritative bathymetry // as contributed by the hydrographic and scientific communities. We're including higher resolution data all the time as you can see from the boxes, and more will be coming from off W. Australia as it was recently announced that the data collected in the search will be made available to the scientific community.



As researchers gain opportunities to map certain areas of the seafloor in higher resolution they also need to perform terrain analyses in order to interpret and classify the bathymetry. For example, in the **western Pacific** GIS analyses of the ocean floor have helped to discover 50 new volcanoes and rift zones in this VERY geologically active part of the world where major earthquakes and tsunamis have caused great devastation.



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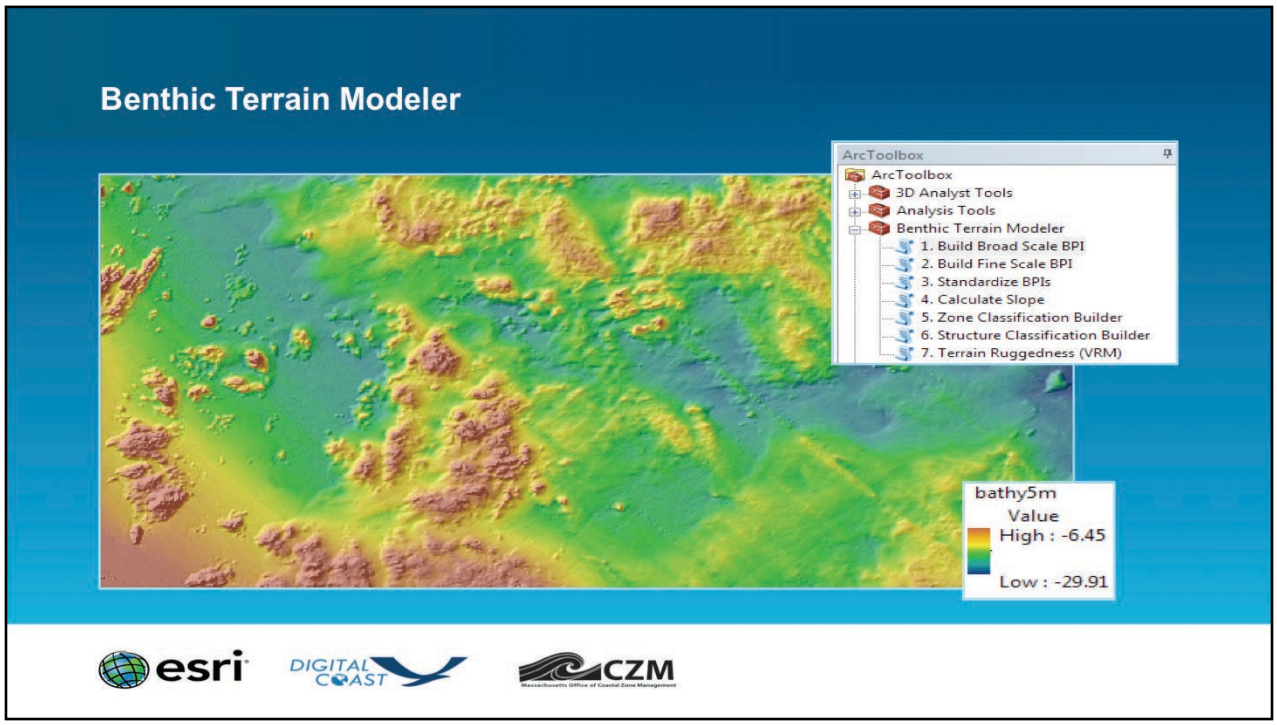
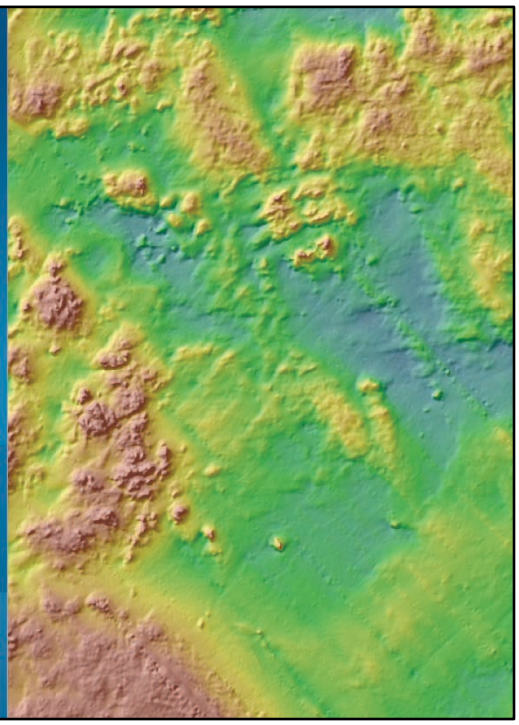


Introducting BTM, a seafloor terrain analysis app, originally developed in the Davey Jones Locker lab at Oregon State U. in collaboration witn NOAA. Now an open source project supported by Esri, still in collaboration with NOAA and the Mass Coastal Zone Mgmt Office

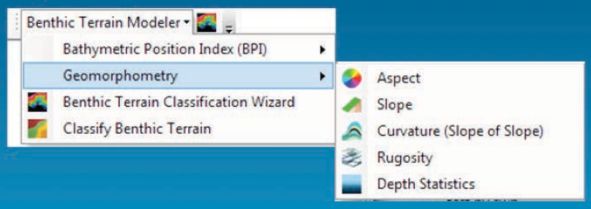
Benthic Terrain Modeler Demo

Shaun Walbridge



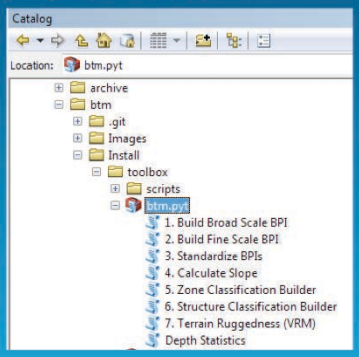
Multiple Environments

Python Add-in



- GUI
- Geoprocessing (Tools + Model Builder)
- Command-line
- Interactive (IPython / Python Console)

Python Toolbox

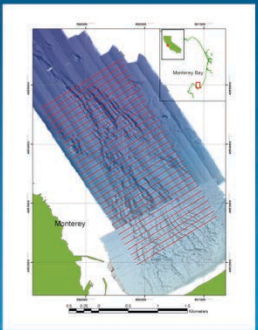


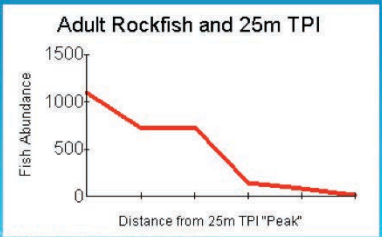
What is it used for?

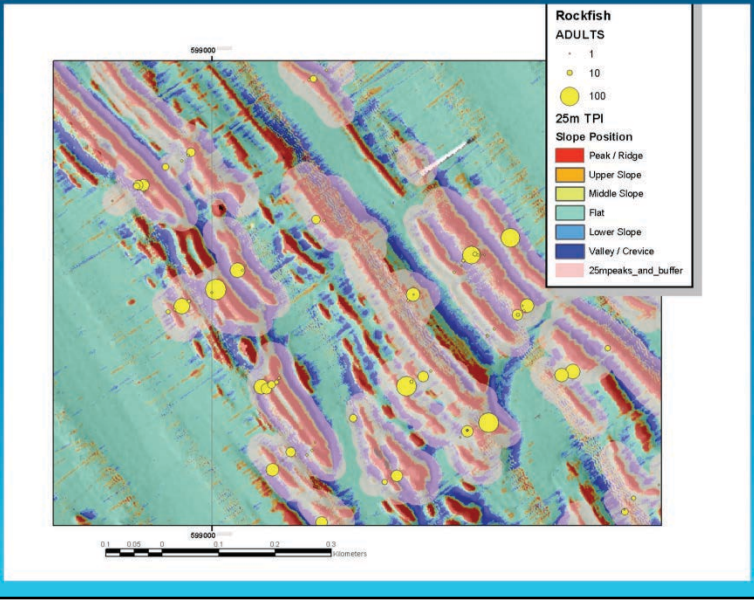
- Benthic habitat classification
- Species distribution models
- Exploratory analysis

Courtesy of Pat Iampietro

Fish Abundance & BPI



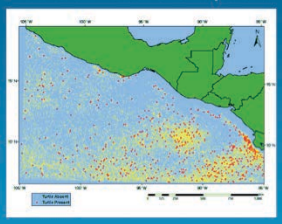




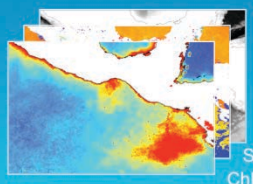
Courtesy: Jason Roberts, Duke

BTM output into a predictive model (e.g. MGET)

Point observations of species



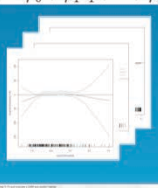
Gridded environmental data



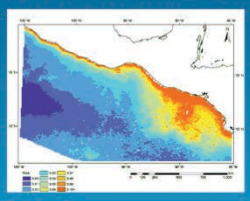
Bathymetry
SST
Chlorophyll

Predictive model

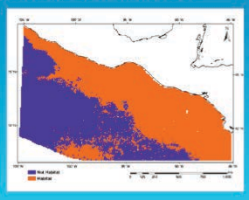
$$g(\mu) = \beta_0 + \beta_1 x_1 + \cdots + \beta_m x_m$$



Probability of occurrence predicted from environmental covariates



Binary classification



Links

- **Download:** http://4326.us/btm
- **GitHub:** https://github.com/EsriOceans/btm
- **Mailing List:** http://lists.oregonstate.edu/mailman/listinfo/btm

PLEASE INCLUDE THIS SLIDE

For attendees: Here are the instructions for users to access the system.
The UC surveys can be accessed from:
1. My UC Homepage > Evaluate sessions
2. www.esri.com/ucsurveysessions

The MyUC login is on the back of their badges.

The session can be found through:
1. My planner listings on survey search page
2. Using the Search based on:
    - Topic, Date, workshop type and event
    - Offering ID – this is in your schedule or the printed agenda (not in the online agenda this year)

There are 6 quick multiple choice questions plus a space for comments

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Understanding our world.
Esri UC 2014 | Demo Theater | Benthic Terrain Modeler