

Mapping Marine Human Uses

Techniques and Lessons Learned From the Docks

Tim Welch, Senior Developer, Ecotrust

Charles Steinback, Director of MSP, Ecotrust



Focus of This Talk



Best practices and lessons learned for using *spatial surveys* to collect local expert knowledge and map human uses.

What are spatial surveys?

Traditional survey with **map-based questions**



Recreation Areas



Fishing Grounds

A Decade of Experience



Ecotrust began developing a methodology and tools for mapping human uses in 2001, and have since been using them in:

- California (MLPA)
- Oregon (Regional/Oregon Territorial Sea Planning)
- Massachusetts
- Mexico
- St. Kitts/Nevis

Partnering with Natural Equity, TNC, Mass. Ocean Partnership, SOORC and others

Survey Methodology at a Glance



Open OceanMap platform created for designing and deploying spatial surveys on the desktop or web

Start Page → **Instructions: Navigation** → Instructions: Layers

How to Navigate the Map

Use the blue navigation controls on the right to zoom to where you started the trip on which you are reporting.

Detailed Instructions

- Pan the map North, South, East or West using the arrow buttons on the map or your keyboard to center the map over your starting location.
- Zoom the map in and out by clicking the '+' and '-' buttons on the map, or the scroll wheel on your mouse, if you have one.
- Return the map to its original view of the entire coast with the 'Reset Map View' button.
- Get as close as you can to your starting point, then press the Continue button

[Watch Demonstration](#)

[Continue to page 2 >>](#)

Terms of Use

Source: Massachusetts Recreational Boater Survey

Survey Methodology at a Glance



Capture spatial information and aggregate in useful ways

Activity Locations



Activity Density



Source: Oregon MarineMap

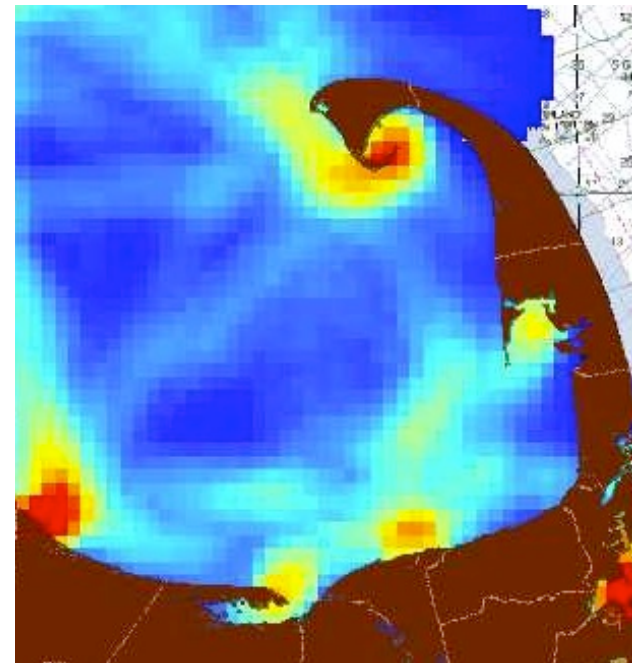
Survey Methodology at a Glance

Capture spatial information and aggregate in useful ways

Rec. Boat Routes



Rec. Boat Density



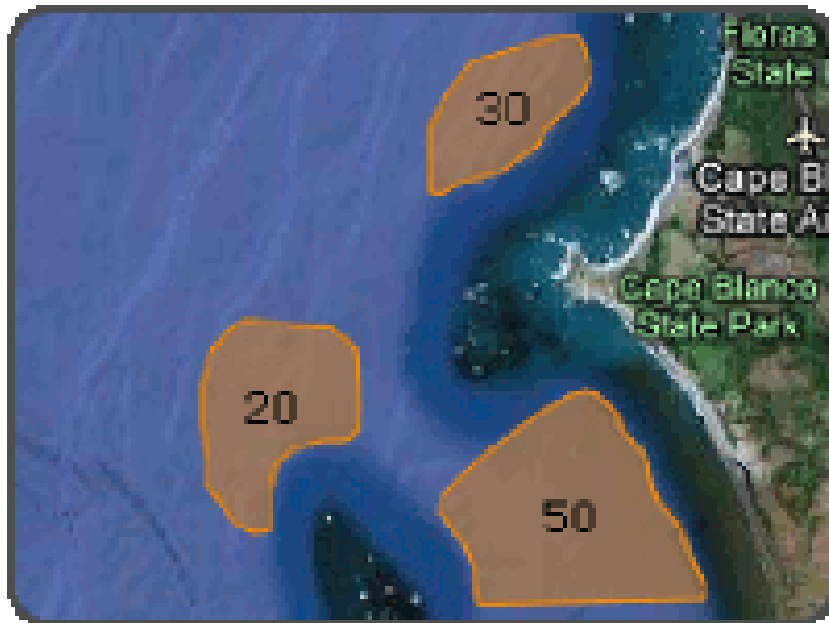
Source: Massachusetts Recreational Boater Survey

Survey Methodology at a Glance

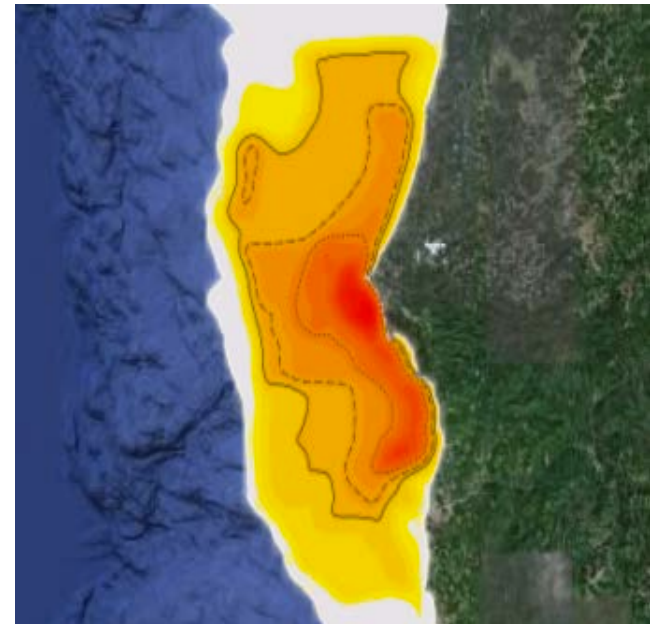


Capture spatial information and aggregate in useful ways

Fishing Areas



Potential Fishing Value



Source: Oregon MarineMap

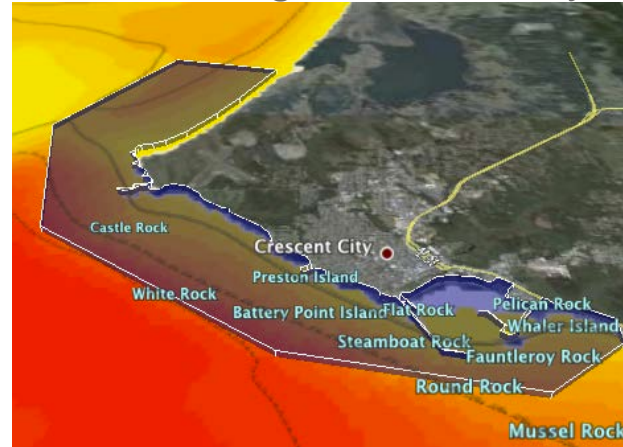
Survey Methodology at a Glance

Aggregated maps then support impact analysis

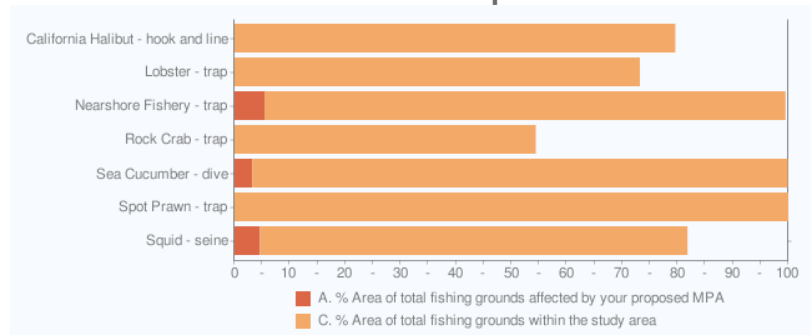
Sample Proposed MPA



With fishing value overlay



Potential Impacts



Source: North Coast
MLPA MarineMap

Survey Methods

- Field survey with laptop
- Field survey with paper
- Web survey unattended
- Web survey over the phone

Evolving Collection Methods

Field Surveys with laptop

- Survey people in-person, controlling the tool
- Highest quality information
- Time consuming
- Great for small samples

Example: commercial fishing



Evolving Collection Methods

Web Surveys:

- Unattended survey over the web
- Effective for large samples
- Larger technological bias
- Potential for reduced quality information



Example: coastal recreational activities

Evolving Collection Methods

Paper Maps:

- Addresses distrust of technology and lack of power source
- Least efficient
- Data is input digitally after the interview



Web Survey Success Rate



- Of web surveys where users map *points*, on average about 90% are able to finish successfully. *Polygons*, about 75-80%.

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That's pretty good but we're losing people right?

Technological Bias in Web Surveys

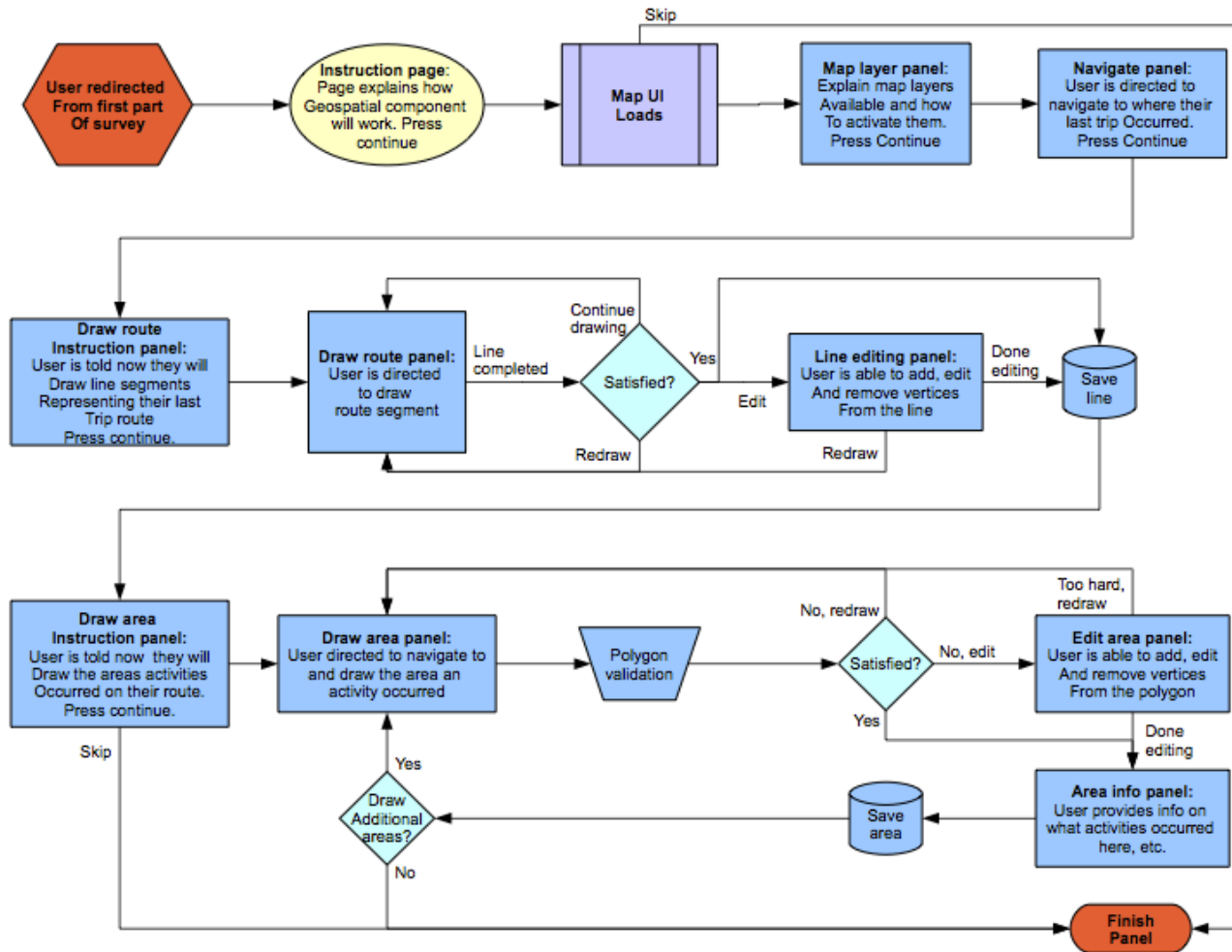
- We are clearly alienating part of our sample by requiring them to:
 - Have a computer and know how to use it
 - Have internet access
 - Learn how to navigate a web map
 - Learn how to draw features on a web map

Reducing Technological Bias in Web Surveys

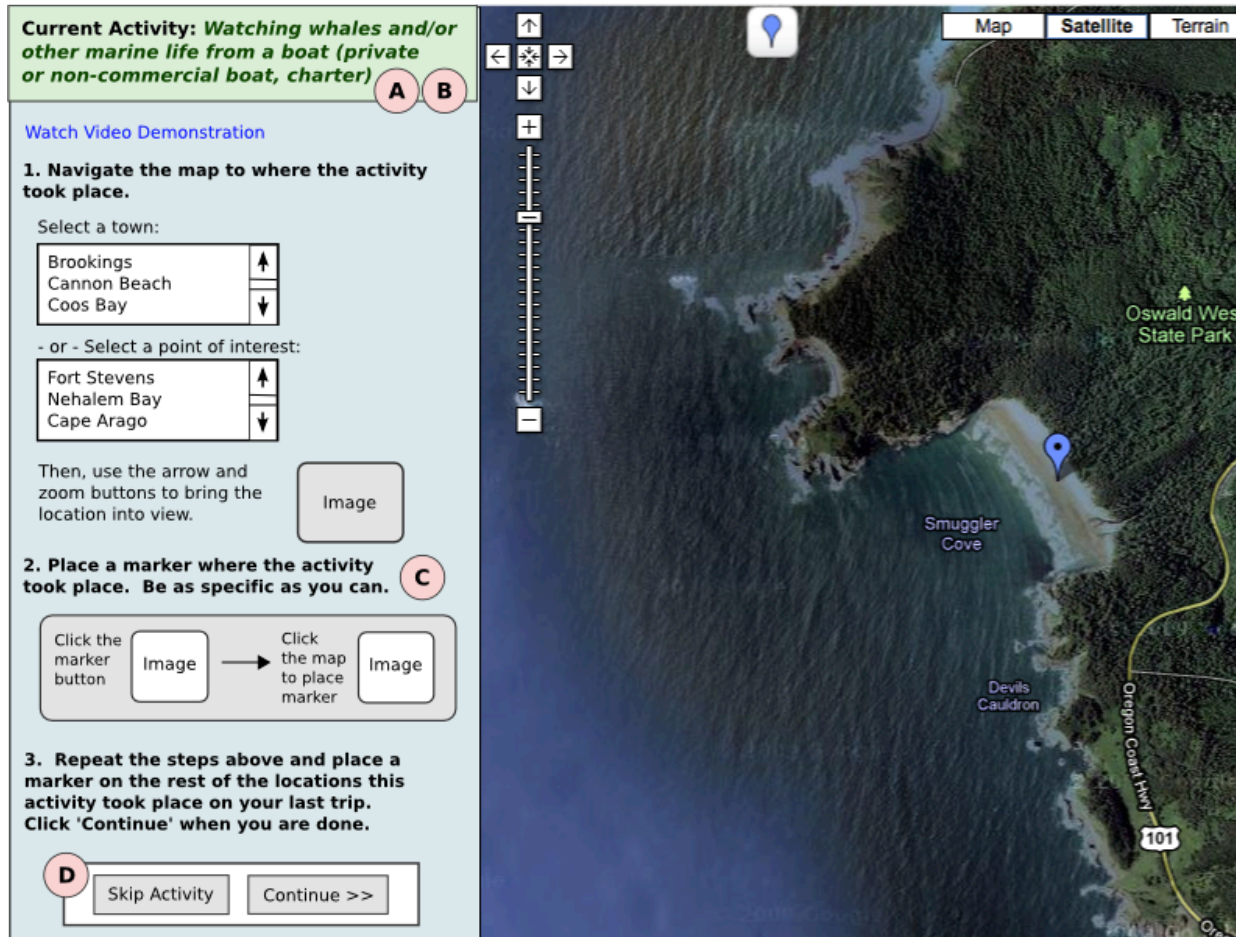
- Test your surveys multiple times with a sample group
- Decide what is too much for someone to figure out on their own
- Track who doesn't finish their survey and:
 - Offer a phone interview
 - Offer an in-person interview

Web Survey - UI Design Tips

Develop a Survey Workflow



Create Wireframes



Notes

A. User draws for all activities, one after the other.

B. This is the longest activity name. Some just won't be able to figure out the map but we still want them to finish.

C. This screen is point/marker specific. Area drawing will have a different panel.

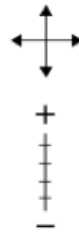
D. User is able to skip this activity and ultimately the whole drawing if they want. Some just won't be able to figure out the map but we still want them to finish.

Source: Oregon Coast Recreation Survey

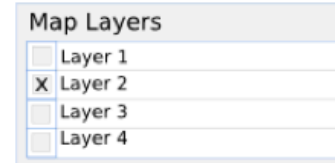
Be Consistent With Your Design

Left Panel

- The left panel is a single source of information for what is expected of the user in the current step whether it's making a decision or carrying out an action.
- Left panel elements include text instructions, visual instructions, buttons and other interactive elements as needed.
- Complex workflows such as drawing are often introduced first in this panel as a step-by-step series of images with text.
- The user learns to look here for what to do next, less confusion.
- When the current step is completed this panel will update while the map state may stay the same.



Drawing Buttons



MAP

- Provides all map specific controls as needed including:
 - navigation, pan and zoom (top left)
 - drawing buttons (top middle)
 - map layer toggling (top right)
 - lat/long position of mouse cursor (bottom right)
 - scalebar (bottom right)
- Allows user to draw, edit and interact with map features (points, lines, polygons)

- Lat/Long
- Scalebar

Start Simple

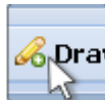
- Order survey activities from easy to hard
 - Demographic questions
 - Economic questions
 - Turn on and off data layers
 - Navigate the map
 - Drop markers
 - Draw areas

Show Don't Tell

Example: 2 ways to explain how to draw an area

Detailed but complicated

a. First, click the 'Draw Area' button



b. Click once on the map to start drawing your area



c. Move mouse and click to create a second point



d. Continue clicking, tracing out the boundary of your area



e. Use the arrow buttons to move the map as you go



f. Double-click the last point to complete the area



g. If you made a mistake, click the 'Cancel' button to start over



Simpler



Assume People Will Get It Wrong the First Time

**Are you satisfied with the area you
drew?**

Yes

Save this area

No, edit

**Make some edits
to this area**

No, redraw

**Discard this area
and draw it again**

Constrain the Drawing

- Minimum zoom level to draw
- Maximum area for polygon
- Decide on error conditions and catch them:



Self-overlapping shape



Overlapping shapes

Leave People a Way out

Some people just can't figure things out but we may still want their information

 [Watch Demonstration](#)

Skip this step

Web Survey Usability Testing



Multiple techniques:

- Capture information during the survey
- Ask for feedback after survey
- Observe web survey takers in person

Capture Information During Survey

- Survey start time
- Survey end time
- Time entered and exited different survey segments
- Map scale used when drawing

Ask for Feedback

- At the end of the survey ask the user if and where they had difficulty
- Use the feedback to make improvements

Observe Survey Taker in Person



- Observe people directly as they take the web survey, asking them to talk aloud while you document.

Take Home

- Ecotrust has a variety of methods for capturing local knowledge and mapping human uses
- Open OceanMap has been a successful platform for developing and deploying spatial surveys used in human use mapping
- There are a number of UI design principles and usability guidelines that we follow to improve our survey and tools in general. Hopefully, you can learn from them

Questions

- Tim Welch, Senior Developer
 - twelch@ecotrust.org
- Charles Steinback, Director of Marine Spatial Planning
 - charles@ecotrust.org
- Recommended Reading:
 - Don't Make Me Think
 - Rocket Surgery Made Easy