Participatory Marine Protected Area Design Using a Web-Based Open Source Tool

Will McClintock (UCSB), Charles Steinback (Ecotrust), Chad Burt (UCSB), Colin Ebert (UCSB), Jared Kibele (UCSB), Chris Macdonald (UCSB), Matt Merrifield (The Nature Conservancy), Mike Mertens (Ecotrust), Tim Welch (Ecotrust), Alexei Peters (Farallon Geographics), Dennis Wuthrich (Farallon Geographics)

American Association of Geographers
March 25, 2009
Outline

- **California Marine Life Protection Act (MLPA) Initiative**
  - What is it?
  - The people - Stakeholders, Science Advisory Team, Blue Ribbon Task Force

- **Decision Support System**
  - Database
  - MarineMap
California Marine Life Protection Act Initiative

- **Marine Life Protection Act (1999)**
  - Mandates establishment of a managed network of MPAs to:
    - Protect marine life, habitat, ecosystems and natural heritage.
    - Improve recreational, educational and study opportunities provided by marine ecosystems.
  - Must use best, readily available science to guide decisions.

- **MLPA Initiative – a Public-Private Partnership**
  - Initiative Staff
  - Stakeholders
  - Science Advisory Team
  - Blue Ribbon Task Force
MLPA Initiative Study Regions

- **To be completed by 2011**
  - Completed Phase I and II (29 new MPAs established for Central California in August, 2007)
- **Now: Southern California**
  - Includes Channel Islands
MLPA Initiative Structure

- California Fish and Game Commission
- Blue Ribbon Task Force (BRTF)
- Science Advisory Team (SAT)
- Stakeholders
- Initiative Staff
MarineMap.org

- Consortium of scientists and technologists
  - TNC
  - Ecotrust
  - UCSB
- Contracted by MLPA Initiative to develop and host decision support system
Geospatial Information Used in Process

- Habitat
  - Distribution of kelp, seagrass, substrate types, bathymetry.

- Biological
  - Distribution of fish, birds, mammals, invertebrates, corals.

- Physical
  - Sea surface temperatures, upwelling, salinity, currents, impaired water bodies

- Cultural
  - Distribution of ports, coastal access points, cities

- Socioeconomic Data
  - Consumptive and non-consumptive activities (e.g., commercial and recreational fishing, recreational boating, diving, educational)

- Base (reference) Layers
  - Existing MPAs, Study Area, Graticules, Nautical Charts
The Geospatial Database

GEODATABASE
- central data repository
- derived products
- proposed MPAs and networks

LEVEL 1 ACCESS
Two-way data transfer

LEVEL 2 ACCESS
One-way (broadcast) data transfer

MLPA GIS Team
MLPA Initiative Staff

Science Advisory Team
General Public

ArcGIS::SDE
qGIS

MarineMap
Participatory Process

Stakeholders Design MPAs

At stakeholder meetings
• Real time collaboration
• High pressure environment

At home
• Low pressure environment
another great place
created by mmerrill on 12/15/2008
- SMP

Total Area as Related to SAT Guidelines
The Science Advisory Team (SAT), has set guidelines for the size of MPA candidates. If considered (especially if it is part of a larger cluster of MPAs):

- Below Minimum: 0-0.5 square miles
- Above Minimum: 5.9-18 square miles
- Preferred Size Range: 10-36 square miles
Software Stack

- **Database**: PostgreSQL/PostGIS
- **Web map services / handler**: GeoServer / OpenLayers
- **Web framework**: GeoDjango
- **Operating System**: Ubuntu Linux

**In the next six months** we will replace OpenLayers with Google Earth API
Summary

- Large geospatial database
- Web-based application for:
  - Viewing data
  - Drawing MPAs
  - Analyzing MPAs
  - Sharing MPAs
  - Place-based discussions

- MarineMap system may be applied to any geography!
  - Our team is extending MarineMap to other planning efforts.
Acknowledgements

- Resources Legacy Fund Foundation
- California Department of Fish and Game
  - Paulo Serpa, Chad Miller
- MarineMap Development Team:
  - Chad Burt (UCSB)
  - Charles Steinback (Ecotrust)
  - Chris Macdonald (UCSB)
  - Colin Ebert (UCSB)
  - Jared Kibele (UCSB)
  - Matt Merrifield (TNC)
  - Mike Mertens (Ecotrust)
  - Scott Fletcher (Ecotrust)
  - Alexei Peters (Farallon Geographics)
  - Tim Welch (Ecotrust)
  - Dennis Wuthrich (Farallon Geographics)

For more information: [http://marinemap.org/mlpa](http://marinemap.org/mlpa)
Email: mcclintock@msi.ucsb.edu
Thanks

http://www.marinemap.org
http://www.marinemap.org/marinemap

Follow us on Twitter

http://twitter.com/marinemap