The Development of an Oceanographic Atlas for Fisheries Applications in the Pacific Basin

Rusty Brainard
NOAA Fisheries, Honolulu Laboratory

Dave Foley, Ramzi Mirshak, John Sibert
Joint Institute for Marine and Atmospheric Research, UH
There are a bewildering number of datasets available. Each has its own, unique format for storing information. Many people do not know of these datasets let alone how to access them. These data are useful for understanding fisheries habitat.
Challenge

Distribute these data in a form that is both accessible and convenient to end users.

- Researchers and Scientists
- Fisheries Management Personnel
Ocean Features Important In Fisheries

- Ocean ‘fronts’, boundaries, ‘edges’
- Mesoscale circulation patterns, e.g., eddies, meanders, ‘loops’
- Convergence zones
- Vertical thermal topography
- Ocean surface winds
Time and Length Scales

Spatial and Temporal Scales of Various Oceanic Phenomena
Foley and Sibert

Infrastructure Established

- Industrial strength web server (CoastWatch)
- Data processing hardware (NMFS)
- Quality control methods
- Data processing software
- Data set documentation
Ocean Atlas Project
Timelines

<table>
<thead>
<tr>
<th>Atlas Task</th>
<th>FY01 4th quarter</th>
<th>FY02 1st quarter</th>
<th>FY02 2nd quarter</th>
<th>FY02 3rd quarter</th>
<th>FY02 4th quarter</th>
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<tbody>
<tr>
<td>Develop web site</td>
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<td>Acquire <em>in situ</em> data</td>
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<td>Reprocess <em>in situ</em> data</td>
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<tr>
<td>Acquire satellite data</td>
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<td>Reprocess satellite data</td>
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<td>Produce Maps</td>
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<tr>
<td>Distribute maps</td>
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- Continues indefinitely for some data
- Continues indefinitely via CoastWatch
Atlantis Distribution

- Create a series of hard-copy atlases for the EEZ’s
- Develop a website that will store and make available data and products in a wide array of formats
U.S. EEZ in Western Pacific

- Guam
- Northern Mariana Islands
- Wake Island
- Johnston Island
- Northwestern Hawaiian Islands
- Main Hawaiian Islands
- Kingman Reef
- Palmyra Atoll
- Jarvis Island
- Howland and Baker Islands
- American Samoa
- Australia
Data Sources: In Situ

- World Ocean Database, NODC, NOAA (Temperature, Salinity, Oxygen)
- NODC/UH SAC Shipboard ADCP Global Database (Ocean Currents)
- COADS (SST, Wind, SLP, Wave Height)
- NMFS HL Cruise Data (Temperature, Salinity, Oxygen, Ocean Currents)
Oceanographic Properties

- Spatial (3D) and Temporal coverage of
  - Temperature
  - Salinity
  - Oxygen Concentration

- Depth Profiles
- Tracing of isotherms and isohalines
- Property at depth maps
Sample In Situ Data

Sea Surface Temperature in the SW Pacific in 1997
COADS *in situ* data, by month
Depth Profiles

Temperature near FFS and Laysan in Aug-Oct, 1990-1995
Salinity at 100 m depth, June - August
<table>
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<tr>
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<td>November</td>
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<td>December</td>
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Data Sources: Satellite

- **TOPEX** (Sea-Surface Height)
- **SeaWiFS** (Ocean Color)
- **MCSST/GOES** (Sea-Surface Temperature)
- **ERS/QSCAT** (Winds)
Wind-Stress Curl derived from ERS Satellite Data


Data To Acquire

- US Navy
  - MOODS profiles
  - NOGAPS winds
- In Situ
  - ARGOS drifter data
- Model Output
  - IPRC
SODA Data Re-analysis Product
OGCM with Data Assimilation
January Climatology

Zonal Current, 7m Depth
Meridional Current, 7m Depth

Currents, Temperature and Salinity
Approximately 14 levels in upper 200 metres
Monthly Data from 1950 to 1997

Data Courtesy of UH/SOEST/IPRC
Produced by Carton et al., JPO, in press
Other Products/Data

- Geostrophic and Ekman currents
- Predictions of thermocline depth from SSH
Equatorial Currents Derived From Remotely Sensed Fields, January 2001

Techniques Adapted from Lagerlof et al. (1999)
Eddies and SSH: Effect on Thermocline

![Graph showing SSH effect on thermocline](image)
Status Report

- Most data are acquired and processed
- Website development is underway
- Development of ocean products is underway
Applications: Coral Reef Monitoring
Conclusions

- Ocean atlas will provide easy access to many oceanographic data sources as well as some derived products.

- Data collection for the ocean atlas is nearly complete.

- Atlases will be published in volumes and data will be available from a website.
Still to do…

- Build hard-copy atlases for EEZ’s
- Continue with data collection
- Continue building data-acquisition methods for the web
- Continue advertising atlas, and recruiting ideas for desired products…