Outline

West Coast Observing System (WCOS) Overview
• Project Background
• Data Collection & Logistics
• Data Management Flow & Integration
• Products and Tools
• Metadata & Documentation

• Summary

Current Activities
• Integrating additional data sources to the WCOS
Project Background

• Project Objectives:
  – Make west coast National Marine Sanctuary Program monitoring data accessible via the internet in an Integrated Ocean Observing System (IOOS) compatible format;
    • Support Discovery, Transport, Access, Archival and Outreach
  – To support Science-based management

• Project Partners (Integrated Product Team)
  – Partnership for Interdisciplinary Ocean Studies (PISCO)
  – National Marine Sanctuaries Program Office
    • Monterey Bay NMS; Channel Islands NMS
  – National Coastal Data Development Center
  – National Oceanographic Data Development Center
Science-based Management

Physical Ocean Processes and Conditions
- Currents, Temperatures and Nutrients Measured by Sea Station moorings

Influence

Ecological Patterns and Changes
- 2005 West Coast Sudden Plankton and Rock Fish Declines

Influence

NMSP Management decisions and actions
- Improved with better data and Metadata from PISCO, SIMoN, NCDDC, NODC, etc.
Data Collection & Logistics

**Description:** Responsible for instrument purchase, logistics, and preliminary technical support

**Members**
- Steve Gittings - NMSP
- Mark Carr - PISCO
- Ed Bowlby - OCNMS
- Andrew Devogelaere - NMSP
- Patrick Drake - PISCO
Sanctuary Environmental Assessment (SEA) station mooring locations maintained by PISCO

Data Collection & Logistics

- **GFNMS**: 3 sites
- **MBNMS**: 11 sites
- **CINMS**: 6 sites
PISCO Nearshore Mooring System

Detachable Service Line

Surface Loggers (~0.5 M)

Subsurface Float

Top Loggers (4 M)

Mid-Water Loggers (~10 M Intervals)

Bottom Loggers (20-100+ M)

Cushioned Service Weight (~ 300 Kilograms)

Service Vessel Tie-Up Point

Prevailing Wind

Backup Retrieval Mooring

Primary Instrument Mooring

Service Vessel

Ground Line

Fixed Anchor
Description: Responsible for flow, conversion, and storage of data

Members
- Richard Owens - NCDDC
- Steve Rutz - NODC
- Rex Core - PISCO
- Chris Jones - PISCO
- Jaeson Abraham - NMSP

The workflow system
1. PISCO collects data and performs initial QC; transforms data to ASCII;
2. NCDDC transports the data from PISCO and transforms to NetCDF;
3. NCDDC transports the original metadata and transforms to FGDC;
a. FGDC metadata published to NSDI and GOS;
1. The final data and metadata files are transported to NODC;
2. NODC provides archive and OPeNDAP Services.
Data Management Flow & Integration

**PISCO Catalog Website**

**Access Catalog Holdings**

**NCDDC WCO-NODC Conduit**
- Determine new data
- Retrieve new data and metadata
- Convert data
- Call XML-RPC server to convert and publish metadata
- Package results and send to FTP site

**NODC FTP Server**

**Send**

**NODC Retrieval Process**

**Retrieve**

**NODC OPeNDAP Server**

**Publish**

**NODC Archival**

**• Convert EML to FGDC XML**
**• Publish to various systems**

**XML-RPC Server**

**Send EML Metadata for Conversion and Publishing**

**• Ingest**

**MERMAid**

**• Publish**

**• Publish**

**PISCO Catalog**

**PISCO Data Site 1**

**PISCO Metadata Site 1**

**PISCO Data Site 2**

**PISCO Metadata Site 2**

**NCDDC Metadata Catalog**

**NCDDC Clearinghouse Node**

**Publish**
Data Products & Tools

**Description:** Responsible for end product development

**Members**
- Jason Stradtner - NCDDC
- Richard Owens - NCDDC
- Chad King - SIMoN
- Josh Pederson - SIMoN
- Jaaeson Abraham - NMSP

- WCOS project web site pages incorporated into SIMoN web site
  - Internet Map Service for WCOS data visualization
  - WCOS Data Products Webapp
- Provide a search engine that allows the user to locate specific WCOS data on the OPeNDAP Server;
- Preview data set through user-defined plots and statistics as well as data download.
Sanctuary Integrated Monitoring Network


NMSP WEST COAST OBSERVATORIES

The West Coast Observation Project (WCOS) deals with observation data collected at four of the five sanctuary sites located on the west coast. The sites involved include Olympic Coast, Gulf of the Farallones, Monterey Bay, and Channel Islands. The project will focus on various data streams including ocean temperature, current speed, oxygen, salinity, and fluorometry collected at numerous new instrument moorings to be installed within each of the four sanctuaries. These instrument moorings will be maintained and operated by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCES).

The primary objective of the project is to develop a system to make west coast National Marine Sanctuary Program monitoring data accessible via the internet in an Integrated Ocean observing System (IOOS) compatible format. WCOS project partners developed a three pronged approach: in situ observations, information delivery, and technology development.

More Information
- WCOS partners
- Interactive maps
- Data access
- Collaborative tools
- Static maps and images

Interactive Maps

WCOS Viewer

This Internet map application provides a common, geospatially referenced view of coastal and ocean observations in and around the West Coast National Marine Sanctuaries. Observation data are generally grouped into two categories: 1) near real-time observations; 2) long term observations. Near real time observations include marine and land surface weather data acquired from the Meteorological Assimilation Data Ingest System (MADIS). Data are assimilated into a geospatially enabled database on

Monterey Bay NMS

Western Farallones Island Deployment
(slideshow in new window)
Internet Map Service

- Shows regional observed data
- Links NMS data to metadata and data access points
- Links to data analysis, sub-setting and download
OPeNDAP Search Application

- User defined selection yields list of
Data Preview and Access

- Data subsetting, analysis and download tools
Metadata & Documentation

**Description:** Responsible for metadata catalog development

**Members**
- Eric Roby – NCDDC
- David Sallis – NCDDC
- Chris Henton - NCDDC
- Jaeson Abraham – NMSP

**Process**
1. EML record from PISCO transported to NCDDC
2. EML record transformed to FGDC standard
   a. XML-RPC Server converts EML to FGDC via XML Style sheet transformations (XSLT)
3. FGDC record is then published to NCDDC metadata catalog, NSDI Catalog, and Geospatial One Stop
4. FGDC record is then bundled with data for transport to NODC for Archival and service
WCOS Summary

• WCOS ‘end-to-end’ system operational since 2005
• More than 1100 data files automatically processed to date
  – 23 SEA Stations
    • NetCDF
      – Temperature Data
      – ADCP data
    • FGDC Metadata records published
• Accessible through
  – NODC archive
  – OPeNDAP Server at NGI CI
  – SIMoN web site (IMS, Data Access Applications)
  – GOS, NSDI clearinghouse, other metadata catalogs
NCDDC Partnership in IOOS Program Office funded Proposal

“Integrating the NOAA IOOS five Core Variables for the California Current Regional Ecosystem and Linking them to a Preliminary Integrated Ecosystem Assessment”

Additional data sources and will be integrated into the WCOS process
- Additional SEA Stations from Gulf of Farallones NMS and Olympic Coast NMS
- Buoy data from Cordell Banks NMS
- SeaKeeper and underway data from R/V Fulmar and R/V Shearwater
- Biological data from Monterey Bay NMS and Gulf of Farallones NMS

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