OMAO Data Management Roadmap

LCDR Mark Van Waes

INMARTECH 2014 – Corvallis, Oregon

November 18, 2014

U.S. Department of Commerce

National Oceanic and Atmospheric Administration

Office of Marine and Aviation Operations

Ships and aircraft and data, oh my!

OMAO HAS DATA?

Data Collected by OMAO

From NOAA's ships:

– hydrographic surveys

– oceanographic & atmospheric research

– fisheries research & surveys

From NOAA's aircraft:

– Hurricane, weather & atmospheric research

– coastal & aeronautical charting

– hydrologic surveys

– fisheries and marine mammal assessment

OMAO Data Products

OMAO data collection and delivery support:
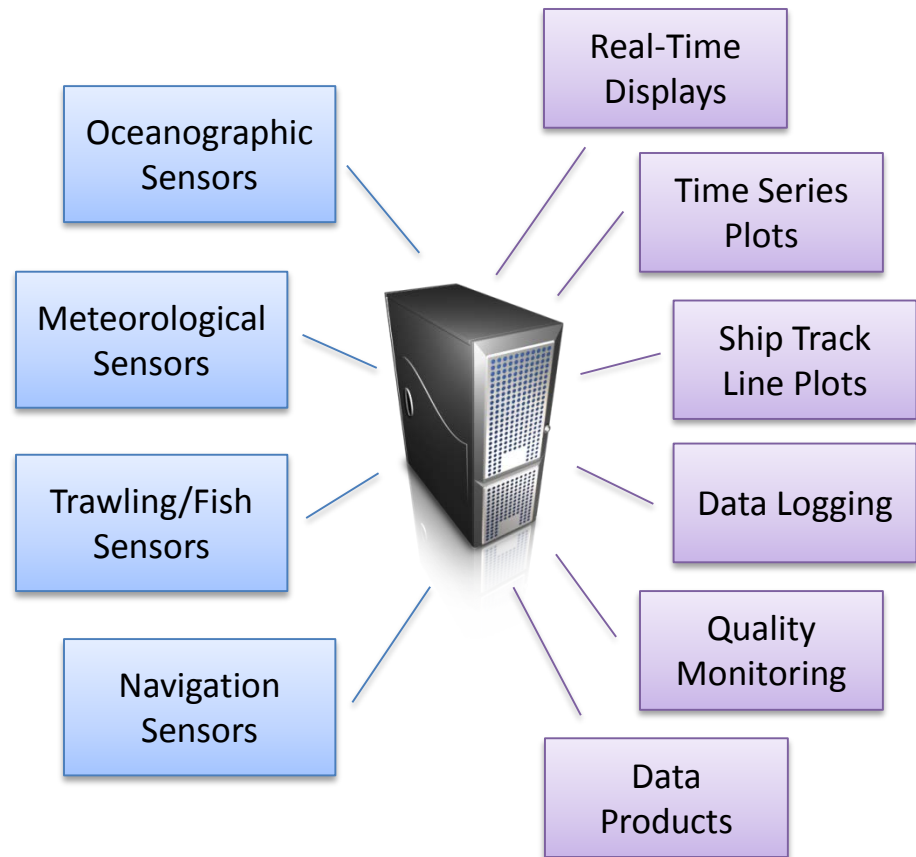
– Hurricane and weather products
Weather-Ready Nation

– Nautical charts
Resilient Coastal Communities & Economies

– Fisheries and marine mammals management
Healthy Oceans

– Atmospheric research and understanding
Climate Adaptation & Mitigation

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations

4
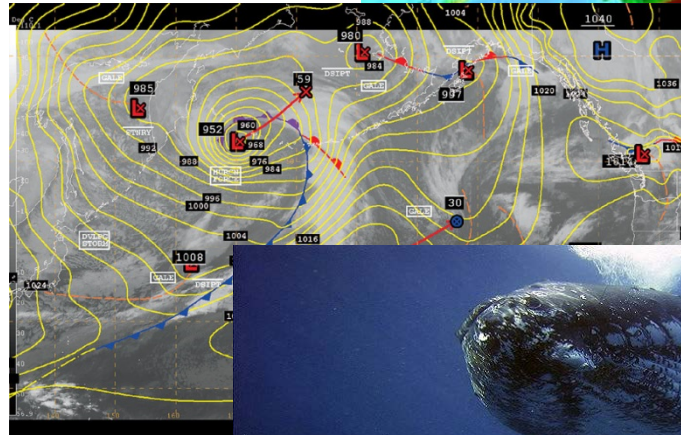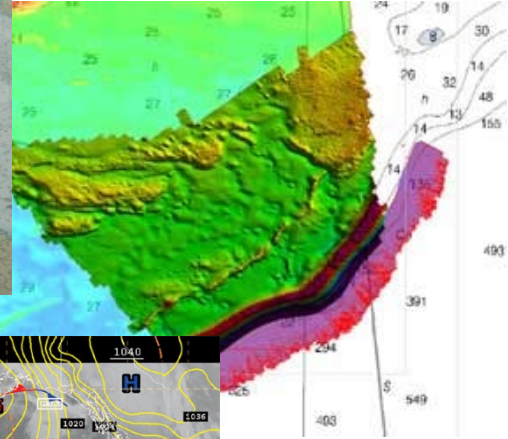
Scientific Computer System (SCS)

- OMAO-developed Data Acquisition System

- Deployed on all NOAA ships

- Shared with US and international partners:

    - UNOLS

    - British Antarctic Survey

    - Canadian Coast Guard

    - JAMSTEC

    - Marine Institute Ireland

Oceanographic Sensors

Meteorological Sensors

Trawling/Fish Sensors

Navigation Sensors

Real-Time Displays

Time Series Plots

Ship Track Line Plots

Data Logging

Quality Monitoring

Data Products

OMAO Data Delivery

NOAA's National Data Centers

– OMAO Data is delivered to, archived and made publicly available by NOAA's National Data Centers
  National Oceanographic Data Center (NODC)
  National Geophysical Data Center (NGDC)
  National Climactic Data Center (NCDC)

Direct Service

– Data acquired by aircraft which are not managed by other NOAA programs is served to the public directly through the Aviation Operations Center data portal

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations

6

Why Data Management?

- OMAO is committed to supporting the NOAA Next Generation Strategic Plan (NGSP)*:
  - Science and Technology Enterprise Goal
  - Objective: Accurate and reliable data from sustained and integrated earth observing systems
- OMAO's 2012-2016 Strategic Plan specifically designed to achieve this goal.

* http://www.ppi.noaa.gov/ngsp/

NOAA NGSP — Science and Technology Enterprise Goal

Objective – Accurate and Reliable Data From Sustained and Integrated Earth Observing Systems

OMAO Vision	The Nation's trusted leader for innovative, adaptive, and reliable oceanic and atmospheric observation platforms
OMAO Mission	Safely deliver effective Earth observation capabilities, integrate emerging technologies, and provide a specialized, flexible, and reliable team responsive to NOAA and the Nation

Mission-Ready Assets

- Maintain and Operate Existing Assets
- Complete Current Platform Acquisition and Transition into Operations
- Optimize NOAA's Fleet (Assets) and Update the Fleet Plan
- Develop, Adopt, and Implement an Asset Lifecycle Management Strategy including Establishing Specific Budget for Asset Investments
- Match Facility Support Structures to the Fleet
- Maintain Applicable Compliance with Aviation and Maritime National and International Safety, Environmental, and "Green" Standards
- Maintain a Set of Available Capabilities from All Service Providers

Highly-Skilled, Adaptive, and Flexible Workforce

- Centralize Management Oversight for all Workforce Planning Functions for our Unique and Diverse Workforce
- Enhance and Maintain a Complete Professional Development Program for all Staff
- Establish and Manage Internship Programs
- Continually Improve Staff Communications
- Match the Workforce to the Optimized Fleet
- Ready the Workforce and Maintain Unique Capability and Expertise in In Situ Observations Leading to Hydrography, Fisheries, and Weather/Climate Mission Accomplishment

Strong Partnerships

- Strengthen Partnerships with NOAA Line Offices through Proactive Outreach, Communications, and Consultative Expertise
- Establish and Maintain Viable Contractual Partnerships with Industry in Areas of Oceanic and Atmospheric Data Collection, UxS, and Advanced Technologies
- Establish and Maintain Viable Partnerships with Selected Research Universities
- Establish Contracts and other Binding Agreements with Sea and Air Observation Service Providers, including Federal Agencies, UNOLs and Commercial Entities
- Improve External Communications

Innovative Processes, Technologies, and Solutions

- Establish Technology Platform Plots in Partnership with Selected Mission Areas
- Explore Technology Transfer Opportunities with Industry and University Partnerships
- Explore the Technology Infusion Impact on the OMAO Workforce
- Establish and Maintain a Virtual "Center of Excellence" for Technology
- Develop and Implement an UxS Roadmap
- Enhance OMAO's Data Delivery Capability

Best-value Stewardship of Resources and Investments

- Improve our Cost Modeling, Financial Tracking and Management Systems and Processes
- Establish Total Asset Visibility
- Explore Creative Contracting Vehicles and Processes for Repair and Maintenance
- Improve Stewardship throughout the Organization through Financial Management, Continuous Process Improvement, and Project Management

OMAO Core Values

Safety	Customer Focus and Collaboration	Integrity	Reliability	Innovation	Stewardship

Okay, but really, why?

- NOAA is an **environmental intelligence** agency
  - Collects environmental data which in turn is used to make **strategic decisions** guiding the progress of the country.

- NOAA's data is its **primary asset.** It's why we're here, operating our ships and aircraft. It drives everything that we do. We need to manage it as the valuable asset that it is.

How do we get there?

DATA MANAGEMENT ROADMAP

What's the Roadmap for?

- Understand where we are
  - Evaluate our current situation
- Determine where we want to go
  - Detail the vision
- Plan how we will get there
  - Address challenges, develop processes and procedures

Where is OMAO?

- OMAO data management is lacking in rigor and effectiveness
  - How much data are we collecting?
  - What is the cost?
  - What is the impact?
  - Is it all documented? (No)
  - Are acquisitions transparent?
  - What is the quality of the data?

Where do we want to be?

- True lifecycle management of environmental data in accordance with NAO 212-15
  - All data covered by Data Management Plans
  - Full documentation meeting ISO standards
  - Data quality is verified and validated
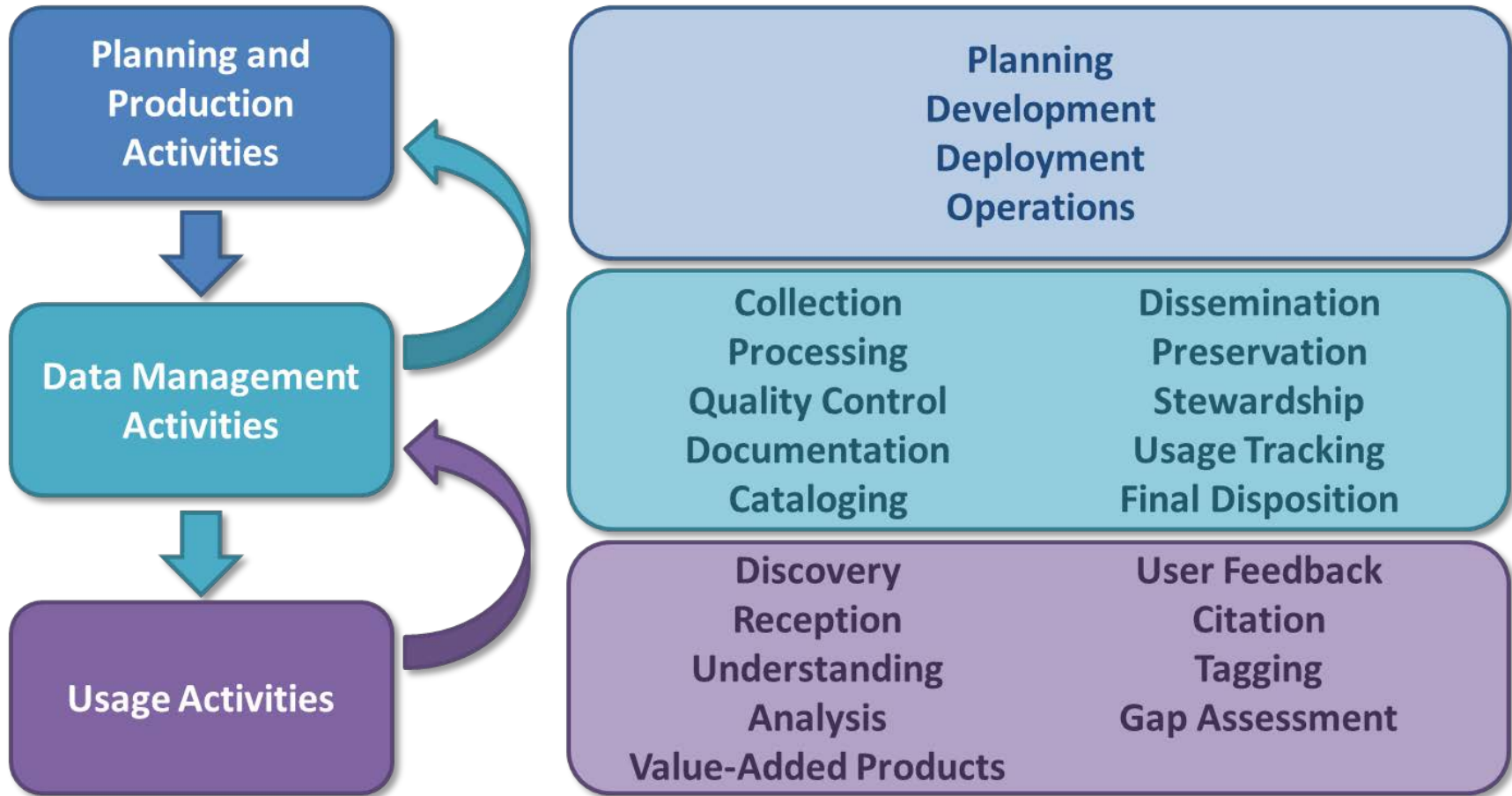 - Data are made available to the public in a timely manner

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations

13

Where do we want to be?

Planning and Production Activities	Planning Development Deployment Operations	
Data Management Activities	Collection Processing Quality Control Documentation Cataloging	Dissemination Preservation Stewardship Usage Tracking Final Disposition
Usage Activities	Discovery Reception Understanding Analysis Value-Added Products	User Feedback Citation Tagging Gap Assessment

The Data Lifecycle (source: NOAA EDM Framework)

How are we getting there?

- Phased implementation
  - Develop and sell the vision
  - Establish/enhance partnerships; execute test projects
  - Roll-out
  - Sustain and expand capability

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations

15

How are we getting there?

- Data Management Project Areas:
  - Data Governance Framework
  - Data Quality Management
  - Data Management Training
  - Rolling Deck to Repository (R2R)
  - Data Metrics Reporting
  - Data Documentation
  - Data Security
  - Data Recovery

Recent Progress

- Data Assembly Center
  - Grant in place with FSU/SAMOS to help manage SCS data for quality, completeness

- Data Management Plans
  - Developing a fleet-wide plan for SCS data

- Data Documentation
  - Pilot project for cruise-level metadata using online collaborative tools for authoring Project Instructions

Recent Progress

- Expansion of capability
  - Grant in place with University of Hawaiʻi to install/support UHDAS software on NOAA ships with ADCP systems
  - Developing process using existing tools for submitting multibeam sonar data to NGDC

OMAO Data Management Challenges

Resource

– Budget uncertainty creates challenges at all levels of Data Management, from planning through archive.

– Personnel/hiring restrictions strain existing resources, affecting OMAO's ability to ensure data quality and documentation.

Technical

– Securing the integrity of data as it is acquired, stored, and transferred; moving large data sets from remote platforms with limited bandwidth; developing and implementing tools to aid data management efforts.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations

19

Questions?

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations