
Response to April 2007 CWG Review of the Climate Observation & Analysis Program

Thomas R. Karl
COA Program Manager

November 8, 2007



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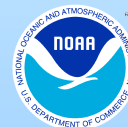
NOAA Climate Working Group Fall Meeting

November 8-9, 2007



Briefing Outline

- **Overview of CWG Findings**
- **COA Responses**
- **Summary**
- **Back-up Slides: CWG Detail Findings**



Climate Working Group Background

CWG Purpose

- NOAA Science Advisory Board Working Group
- CWG Terms of Reference
 - Conduct a non-advocate review of the COA program
 - Complete: Thorough review conducted April 11-13, 2007
 - Provide initial feedback by early May to COA and Climate Goal
 - Complete: Feedback report provided
 - Prepare Final report & Brief NOAA's Science Advisory Board on the Findings
 - Complete: Report complete and briefing given August 2007
 - Discuss Findings at current Fall 2007 CWG meeting



Overview of CWG Findings

CWG Review Panel Comments

“... there is considerable excellent work going on in NOAA contributing to COA”

- **COA efforts that should continue and receive high priority**
 - Collecting observations
 - Creating climate records
 - assuring their quality
 - documenting and making them accessible for research, applications, & decision making
 - Providing valuable climate observational products & services to the Nation



Overview of CWG Findings

CWG Review Panel Comments

CWG review identified overarching strategic issues

- 1. Provide a coherent integrated structure for COA activities**
 - A COA Strategic Plan
- 2. Improve the functions of the NOAA internal budget process**
 - COA Priorities and budgeting
- 3. Engage Partners in priority setting process**

One way forward

- ***VADM Lautenbacher has called for a National Climate Service***
 - *CWG suggests such a Service as a distinct NOAA Line Office*
 - *This could ease many of the perceived management difficulties.*



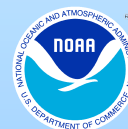
Response to CWG Findings



COA Response to CWG Findings 1 & 2

- ***Finding 1 - COA Strategic Plan Needed***
- ***Finding 2 - Improving NOAA's Internal Budget Process***
 - First step: NOAA Climate Goal reorganization
 - 5 programs reduced to 3
 - Climate Observation and Analysis (COA) program has been refocused and become Climate Observations and Monitoring (COM) program
 - Currently developing a strategic plan for the refocused COM program
 - Potential next step: Proposing a distinct Climate Line Office within NOAA
 - Emphasis on 21st Century Climate Services

Both the Climate Goal reorganization and a possible NOAA Climate Line Office are expected to address many of the budgeting and priorities management difficulties identified in the CWG review



Climate Goal

Restructuring Overview

- **Restructured NOAA's Climate Goal into three programs. Details for COM:**
- **Climate Observations and Monitoring: Understand the past & current state of the climate**
 - Provide comprehensive and integrated atmospheric, oceanic, and arctic observations and monitor the climate forcing agents
 - Data systems and climate data records that can address the current state of the climate at the accuracies and resolution required by users



Description of New COM program

(Additions/Deletions in blue)

Old Climate Observations & Analysis (COA) program

- Former Three Capabilities
 - Observations
 - Data Management
 - **Analysis of Cli. Sys. (moved to Climate Research & Modeling) includes Reanalysis**

New Climate Observations & Monitoring (COM) program

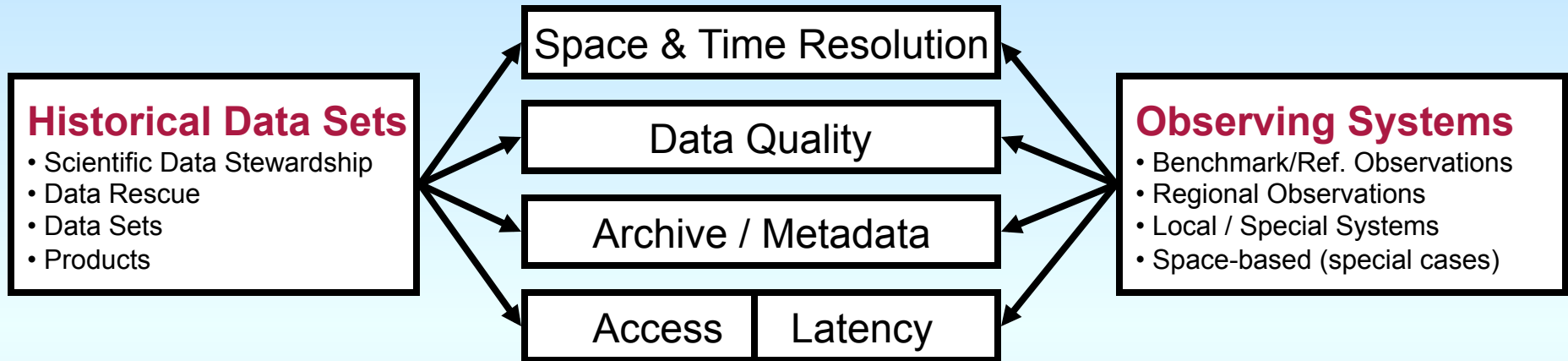
- Now two Capabilities
 - Observations
 - *In-situ: global & regional reference networks, system performance monitoring*
 - *Remotely sensed: (speical cases)*
 - **Carbon monitoring added from old CLF program**
 - Data Management and Information
 - Data storage/metadata
 - Scientific Data Stewardship / Climate Data Record development
 - Data and Information Services/Access (outreach, portals, etc.)
 - Monitoring (e.g., State of the Climate reports, Drought monitoring, etc)
 - **GEO-IDE moved to new Modeling and Infrastructure Sub-goal, STR program**



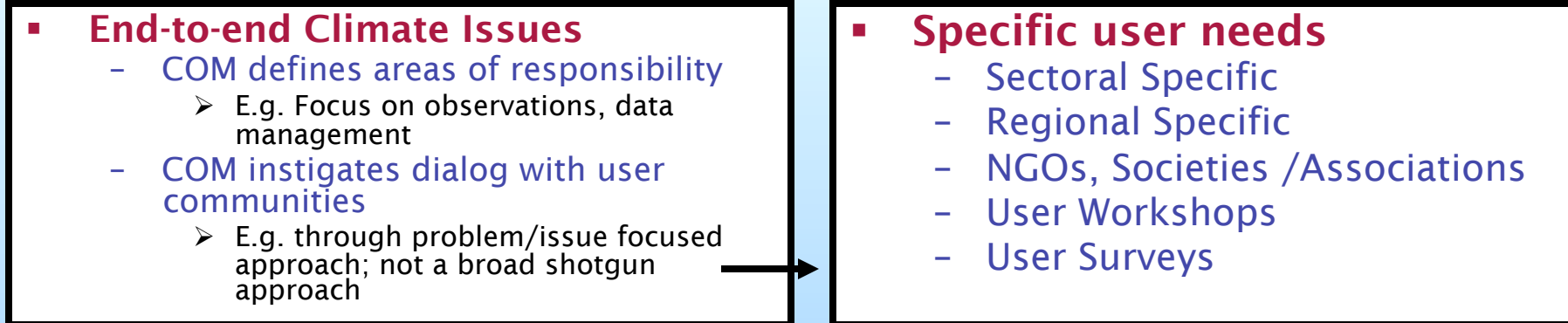
CWG Findings 1 & 2

COM Strategic Plan - Two Strategy Drivers

1. Monitoring Requirements Driver



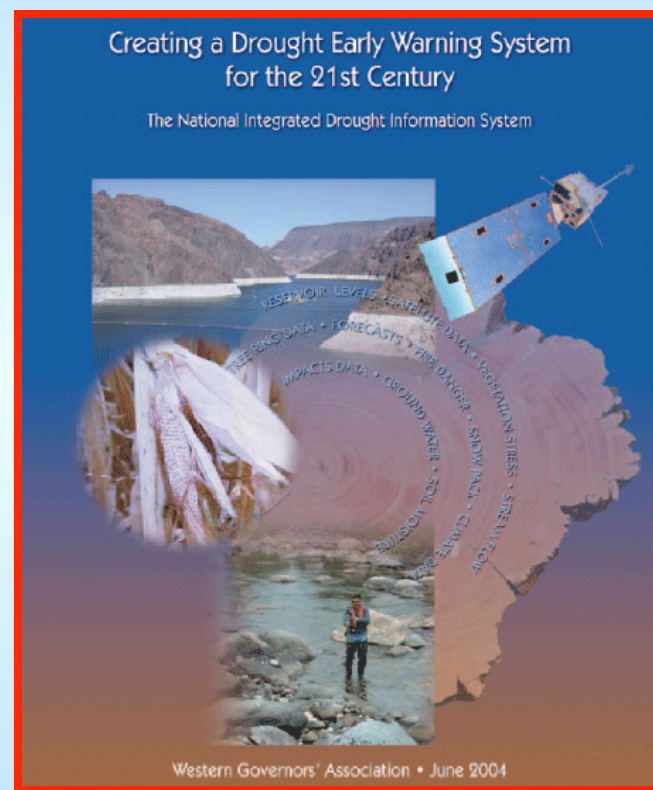
2. User Needs Requirements Driver



CWG Finding 3 - Engaging Partners

A strategy to address critical societal needs

- External groups recommends action
- NOAA develops execution plan which includes external partnerships (E.g. National Integrated Drought Information System – NIDIS effort)
- Specific Implementation Steps
 - Identify critical societal need(s) via workshops, surveys, professional meetings, etc.
 - Identify external partnership to help frame issue and develop requirements paper describing critical needs
 - External partnerships to develop paper identifying the problem, how to solve it, and perhaps estimated costs
 - Develop NOAA documents through PPBES process to define & execute program



**Western Governor's Association
2004 document**



CWG Finding 3 - Engaging Partners

Example: Climate is changing... how to engage users/determine needs

A specific user community example

- Traditional 30-year averages are no longer representative
 - May give the wrong answer to important societal issues
 - New Optimal Climate Normal Techniques are now being explored and developed
 - Will incorporate statistical trend analysis and climate models that better account for current and future climate trends
- Specific User communities are now being engaged

▪ Energy Sector Example

- May & Sep 2007 meetings with energy sector reps.
 - In cooperation with AMS
 - Determine energy sector needs for normals, etc.
- User workshop Nov 2007
 - Energy sector one of the focus groups

NOAA Data and Information for a Changing Climate:
A Conference for Public and Private Sector Users
November 5-6, 2007
The Grove Park Inn • Asheville, NC

ENERGY **INSURANCE** **TRANSPORTATION**

Overview :: Program & Materials :: Working Groups :: NCDC Tour :: Registration :: Hotel and Travel :: Contact Us



Nov 5-6, 2007 NOAA Workshop: Initial Findings

Focus on Energy, Insurance, Transportation Constituents

Shared Themes

- Enhanced integration among agencies and consistency across datasets
- Data as a/the vital bridge:
 - Past, present and future
 - Observations-science-understanding-information-decision support
 - Connecting the dots and recognizing the patterns
 - Anticipating risk to enhancing resilience

Starting a process

- Moving forward together to face shared challenges & opportunities:
 - Scoping the issues - adaptation + mitigation
 - Learning a shared vocabulary
 - Mapping a common path to the future
- Building strong foundations-a great team:
 - Climate observations, data analysis/management, research, modeling, assessments, products and services
 - Corporate and community risk management, operations, development and planning
 - Existing corporate commitments, agency programs, public-private partnerships

The Next Steps

- The next few miles of the journey:
 - 'Scoping papers' on the sectoral discussions; Commitment to sustained dialogue
 - Engaging additional partners; Pursuing suggestions for products and services
- NOAA as a reliable source of information
 - An 'honest broker' for climate science & services
- Capturing and nourishing the ideas, energy & commitment of the workshop
 - Building the climate service "cathedral"



Summary

- COA (now COM) agrees with CWG recommendations
 - Several CWG initial findings being used in the FY10-14 Climate Program development process
 - NOAA Climate Goal has been reorganized
 - COA has been refocused and become COM
 - Initial aspects of a COM Strategic Plan development in progress
 - Engaging user communities through a problem/issue focused approach



Back-up slides containing detailed CWG recommendations



CWG Overview Finding 1

Provide a coherent integrated structure for COA activities

- **Foremost key issue: How the many parts of COA fit together and make a whole program**
 - COA does have an existing programmatic thrust
 - Many coherent projects exist in COA, but...
 - a strategic plan establishes priorities & identifies areas for investment

- **A possible strategic plan model**
 - Comprehensive end to end system: “A Climate Information System” (Trenberth, Karl, Spence, 2002)
 - Observations that satisfy climate observing principles
 - Ingest, archival, access, data stewardship, data integration
 - Analysis, reanalysis
 - Derivation of products, especially Climate Data Records
 - Assessments and attributions
 - Initialization of predictions
 - Responsiveness to users
 - Performance tracking system



CWG Overview Finding 1: Example application

Provide a coherent integrated structure for COA activities

Example of how a COA Strategic Plan would allow priority planning during a crisis

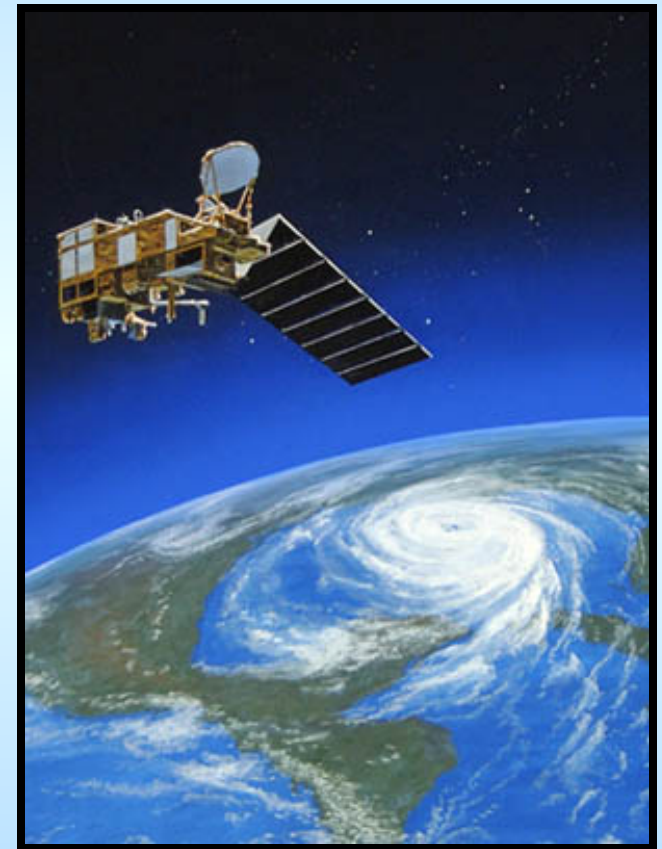
■ 2006 NPOESS Certification

- Low or no priority for climate measurements

- Pre Nunn-McCurdy: 3 orbits; 6 spacecraft
- Post Nunn-McCurdy: 2 orbits; 4 spacecraft

- A strategic plan could consider potential observation failures leading to gaps in climate record

- Example: Some NPOESS data gaps filled by in-situ records such as the proposed Reference Radiosonde Network (RRN)
- Consolidate multiple networks and place high priority and associated funding on RRN



CWG Overview Finding 2

Improve the functions of the NOAA internal budget process

- **Improvement needed between the NOAA Program Planning, Budget, & Execution System & NOAA Matrix Managed Process**
 - Information exchange among NOAA goals regarding requirements, priorities, and funding for projects needed
 - In the NOAA PPBES process, there is a disconnect between the planning/budgeting and execution
 - NOAA Goals perform the Program Planning & Budgeting (PPB)
 - NOAA Line Offices perform the Execution (E) of projects
 - Disconnecting the “PPB” from the “E” limits the flexibility of COA program manager in the ability to manage



CWG Overview Finding 2 – Examples

Improve the functions of the NOAA internal budget process

- **COA Program depends upon other NOAA Goal funding**
 - Observing systems (in-situ, satellite, radar)
 - Funded by other NOAA Goals
 - No clear approval process for objective evaluation of climate requirements in comparison to other requirements (e.g., NPOESS, GOES R)

- **Stronger linkage needed between observing systems and analysis / assimilations**
 - Atmospheric or coupled reanalyses
 - Observations based in NESDIS (Climate Goal)
 - Modeling, assimilation, reanalyses in NCEP-NWS

- **NOAA infrastructure investments exceed the needs of Climate Goal**
 - CLASS (storage of all NOAA data)
 - GEO IDE (standards, protocols for all NOAA data)



CWG Overview Finding 3

Engage Partners in priority setting process

■ **Partnerships should include:**

- International, regional, national, local observing systems and programs
- Universities and other partners in the extramural research agencies
- Partners in a number of other agencies
- Regional partners
 - Examples: Regional Climate Centers, State Climatologists, RISA programs and IOOS Regional Associations
- The private sector active in climate research, monitoring & services

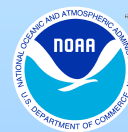
■ **Other Mechanisms to Engage Partners**

- Upgrade and invigorate extramural grants program
 - Especially in the area of reanalysis and attributions
- Enhance a visitor and post-doc program



CWG Findings

Detailed Commentary from 8 COA Panels



CWG Findings

Detailed Commentary from 8 COA Panels

- **Panel 1: Data Ingest, Access, and Archive (and “Storage” CLASS CONOPS)**
- **Panel 2: In-situ Observing Systems and Data Management including Stewardship**
- **Panel 3: Analysis including Reanalysis, OSSEs, OSEs, and related Research**
- **Panel 4: Climate Services and Product Development (half of the hourglass)**
- **Panel 5: User Communities (the other half of the hourglass)**
- **Panel 6: Detection, & Attribution**
- **Panel 7: Understanding the State of the Climate (including data assimilation) and Monitoring**
- **Panel 8: Space-based Observing Systems and related Data Stewardship**



CWG Findings

Detailed Commentary from 8 COA Panels

■ **Panel 1: Data Ingest, Access, and Archive (and “Storage” CLASS CONOPS)**

- Top level NOAA recognition needed that GEO IDE is the solution to integration/ interoperability issues
- GEO IDE and CLASS should be elevated to a higher level within NOAA since they support all of NOAA
 - Ensure broad NOAA integration needs do not swamp the COA climate data management needs

■ **Panel 2: In-situ Observing Systems and Data Management including Stewardship**

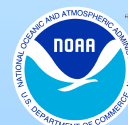
- Encourage an integrative strategy for atmospheric observations
 - Attention to creating climate quality data
 - Adhere to principles and guidelines for climate observations
 - Sparse but high quality land and ocean reference networks good to sustain climate quality data and provide reliable reference points
- Great benefit would be derived from integrating ocean and atmosphere observations with those doing biological and chemical observations



CWG Findings

Detailed Commentary from 8 COA Panels

- **Panel 3: Analysis including Reanalysis, OSSEs, OSEs, and related Research**
 - **Insufficient coordination & planning across NOAA for analysis/ reanalysis**
 - **Activities rely on cross NOAA collaboration**
 - NESDIS-data, NWS-modeling, OAR-analysis
 - **Activities recognized in planning but fragment in the current execution stage**
 - Especially when resources less than needed
 - **Reanalysis is the “poster child” for how NOAA matrix management (execution portion) can negatively impact important components of the enterprise**
 - **NOAA badly needs overall planning & coordination of analysis/ reanalysis**
 - **Must also involve other national and international efforts outside of NOAA**
 - **A first step is to identify leadership**



CWG Findings

Detailed Commentary from 8 COA Panels

- **Panel 4: Climate Services & Product Development (half of the hourglass)**
 - Must equitably cater to the entire spectrum of climate users
 - From millions of marginal/episodic users to thousands of climate researchers
 - Must have feedback loops facilitated by both NOAA & its partners
 - Users engaged with all facets of product development/delivery
 - Develop unified climate services that focuses on discovery and delivery of optimal data and products

- **Panel 5: User Communities (the other half of the hourglass)**
 - Find and engage users through a problem/issue focused approach not a broad shotgun approach
 - Use professional organizations (e.g., AMS, ASCE) to determine needs of large groups
 - COA partners can provide regional & single sector specific products & services
 - COA does not need to replicate these
 - COA should focus on national/global analyses and products



CWG Findings

Detailed Commentary from 8 COA Panels

■ **Panel 6: Detection & Attribution**

- Integrated work among NOAA lines recent but growing
- Strategic Plan needed to further this integration (3 components)
 - **Coordination:** establish a structure to facilitate coordination across NOAA, the national & international attribution community, and users
 - **Research:**
 - Enhance funding to expand computer resources for the improved regional scale ensemble simulations
 - Enhance funding to expand NOAA research
 - Enhance/expand a peer reviewed grants program
 - **Communications:**
 - NOAA needs to speak on climate attribution issues in a coordinated way that maintains agency credibility and reliability
 - A few mistakes can seriously damage NOAA reputation
 - Establish a committee (NOAA and non-NOAA) to guide and provide oversight in a way that promotes open and transparent scientific discourse



CWG Findings

Detailed Commentary from 8 COA Panels

- **Panel 7: Understanding the State of the Climate (including data assimilation) and Monitoring**
 - **BAMS “Annual State of the Climate”**
 - Expand to 2 or more editors and peer review
 - Add attributions component to report; possibly a 2nd report
 - Re-evaluate process for determining and prioritizing ECV’s
 - add new ECVs and place greater importance on others

- **Panel 8: Space-based Observing Systems and related Data Stewardship**
 - CDRs from space based observations requires a new vision and resources within NOAA
 - COA/Climate needs clear path in influencing satellite requirements
 - Right now climate takes a back seat to weather
 - Continue to engage NASA-NOAA programs to address gaps that may emerge in critical data (i.e., NPOESS white paper)
 - COA should move from a re-active to proactive role
 - Priority of ECV’s for CDR development is always shifting based upon scientific progress
 - Need process to re-evaluate

