

The Foundations of the Climate Observation Program

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Acting Director
NOAA Office of Global Programs

Climate Observation Program Workshop
13-15 May 2003

Photo credit: J. Picaut



NOAA's Climate Mission Goal

Understand climate variability and change **to enhance** society's ability to plan and respond

NOAA's Climate Mission Strategies

Monitor and Observe: NOAA will invest in needed climate quality observations and encourage other national and international investments to provide a comprehensive observing system in support of climate assessments and forecasts

Understand and Describe: NOAA will work with national and international partners to increase understanding of the dynamics and impacts of coupled atmosphere/ocean/land systems through research on climate variability and change

NOAA's Climate Mission Strategies (*Cont.*)

Assess and Predict: NOAA will improve its intraseasonal and interannual climate forecasts to enable regional and national managers to plan better for the impacts of climate variability and change and will provide improved regional, national, and international assessments and projections to support policy decisions with objective

Engage, Advise, and Inform: NOAA will work with users of climate information to enable and increase the application of climate information for health and safety, environmental, economic, and community planning, especially for freshwater supply, water quality, and coastal

NOAA Administrator Priorities

Executive Council

54th session of the World Meteorological Organization

Geneva, Switzerland

June 11, 2002

“The greatest challenge is to develop one integrated observation plan for the atmosphere, ocean and land that everyone can support”

“Full and open sharing of data between nations is an essential part of this effort -- including making the data available within sufficient time to be of operational use”

Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.)
Under Secretary of Commerce for Oceans and Atmosphere
Administrator of the National Oceanic and Atmospheric Administration

NOAA Office of Global Programs

- **Mission**

- To support focused multi-disciplinary research and development activities that lead to policy relevant products
- OGP sponsors scientific research that contributes to improved predictions and assessments of climate variability and change over a continuum of timescales from season to season, year to year and over the course of a decade and beyond

- **Structure**

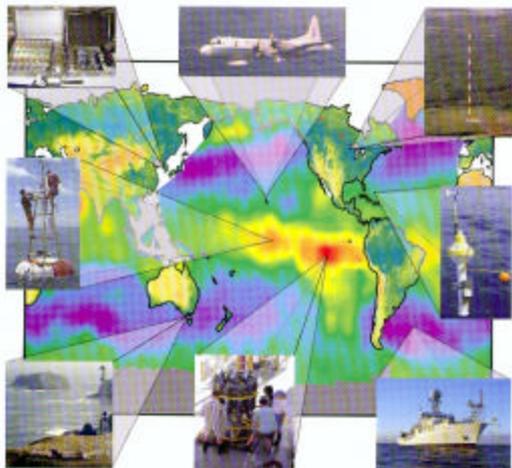
- Climate Dynamics Division
- Climate and Societal Interactions Division
- *Office of Climate Observation*

NOAA Office of Global Programs

- **Climate Dynamics Division (CDD)**
 - Atmospheric Composition and Climate
 - Climate Change Data and Detection
 - Climate Dynamics and Experimental Prediction
 - Climate Variability and Predictability (CLIVAR)
 - GEWEX Americas Prediction Project
 - Global Carbon Cycle
- **Climate and Societal Interactions (CSI)**
 - Applications Research Program
 - Regional Applications Programs (RAPS)
 - Climate Variability and Human Health
 - Climate Information Project
 - Human Dimensions
 - Regional Integrated Sciences and Assessments (RISA)
- **Office of Climate Observation (OCO)**

Three Seminal Publications

A Large-Scale CO₂ Observing Plan: In Situ Oceans and Atmosphere (LSCOP)



A Report of the In Situ Large-Scale CO₂
Observations Working Group

A strategy for global ocean observations

Observing the Oceans in the 21st Century

Edited by:
Chester J. Koblinsky & Neville R. Smith

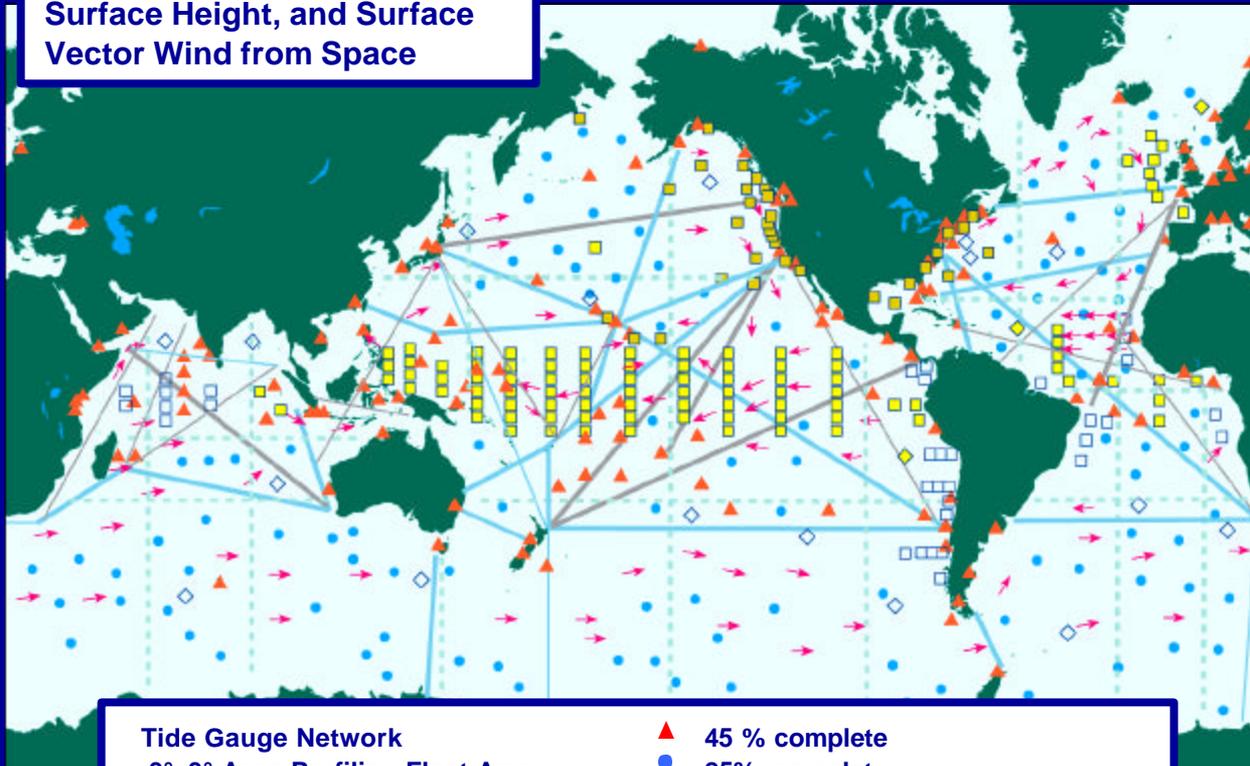
International Sea Level Workshop

10 - 11 June, 1997
Honolulu, Hawaii, USA

WORKSHOP REPORT
April 1998

Building a Sustained Observing System for Climate

Sea Surface Temperature, Sea Surface Height, and Surface Vector Wind from Space

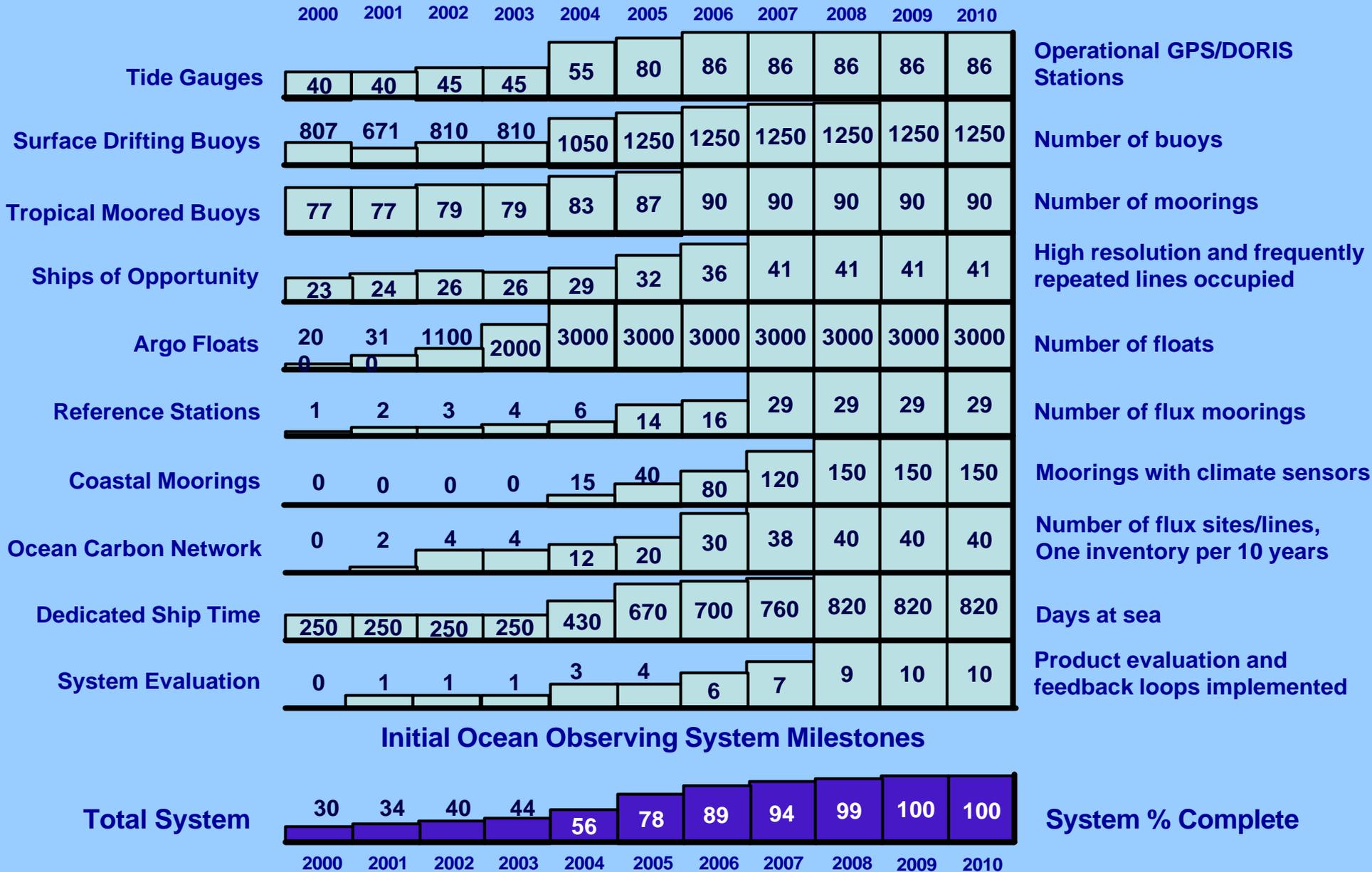


- | | |
|------------------------------------|--------------------------------------|
| Tide Gauge Network | ▲ 45 % complete |
| 3°x3° Argo Profiling Float Array | ● 25% complete |
| 5°x5° Surface Drifting Buoy Array | ← 35 % complete |
| Moored Buoy | ■ Existing □ Planned |
| Ocean Reference Station | ◆ Existing ◇ Planned |
| High Resolution XBT and Flux Line | — Existing — Planned |
| Frequently Repeated XBT Line | — Existing — Planned |
| Carbon Inventory & Deep Ocean Line | ■ Existing ■ Planned |
| | ■ Survey 1.5 lines/year, 50 % funded |

Partnerships are central: A global observing system by definition crosses agency and international boundaries. The potential exists for both benefits and responsibilities to be shared by many.



Implementation Time Line and Milestones





NOAA NODC/WDC



IOC/ODE
GODAR, WOD,
GTSP Projects

World Ocean Database 2001 (WOD01) released March 2002.

PROBE	WOD98	ADDED (% increase)	TOTAL
Bottle (OSD)	1,373,440	715,184 (52%)	2,121,042
High Resolution Conductivity/Temperature/Depth (HCTD)	189,555	120,783 (64%)	311,943
Mechanical Bathythermograph (MBT)	2,077,200	336,953 (16%)	2,376,206
Expendable Bathythermograph (XBT)	1,537,203	215,735 (14%)	1,743,590
Fixed Platform (e.g., TAO, TRITON, PIRATA)	197,715	183,303 (93%)	297,936
Drifting Buoys*	0	50,549	50,549
Profile Float (PFLOAT: P-ALACE, SOLO, APEX)	0	22,637	22,637
Expendable Conductivity/Temperature/Depth (XCTD)	0	811	811
Towed Conductivity/Temperature/Depth (UOR)	0	37,651	37,631
Autonomous Pinniped Bathythermograph (APB)	0	75,665	75,665
Total Casts/Profiles	5,292,032	1,773,383 (34%)	7,037,213
Total Surface-Only data (cruises)	0	4743	4743

*Green indicates data from a “new” instrument type added to the WOD series.

WOD01 can be obtained on-line from (www.nodc.noaa.gov) or as hard copies by sending an e-mail to (wdc@nodc.noaa.gov).

The Future

NOAA Office of Global Programs has a global mandate and will continue to build on its strong international partnerships

Climate Change Research Initiative (CCRI)

- History

- In May 2001, the Bush Administration requested the National Academy of Sciences (NAS) to review the Third Assessment Report of the IPCC and recommend research priorities to reduce uncertainties in climate science.
- *Climate Change Science: An Analysis of Some Key Questions* (NRC, 2001)
- 11 June 2001, the CCRI is established

Climate Change Research Initiative

"Today, I make our investment in science even greater. My administration **will establish the U.S. Climate Change Research Initiative** to study areas of uncertainty and identify priority areas where investments can make a difference. I'm directing my Secretary of Commerce, working with other agencies, to set priorities for additional investments in climate change research, review such investments, and to improve coordination amongst federal agencies. **We will fully fund high-priority areas for climate change science over the next five years.** We'll also provide resources to build climate observation systems in developing countries and encourage other developed nations to match our American commitment."



President George W. Bush
The White House
June 11, 2001

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- Funding
 - FY 2003 - \$40 million
- Goals
 - To enhance ongoing science areas of the USGCRP
 - To measurably improve the integration of scientific knowledge, including measures of uncertainty, into effective decision support tools
 - Will produce deliverables useful to policymakers in a short time frame (2-4 years)

Emphasizes performance metrics and tracking of deliverables

U.S. Climate Change Science Program (CCSP)

- Consolidated interagency management of the:
 - USGCRP
 - CCRI
- A cooperative effort among 13 governmental agencies
- Ensures consistency of the focused CCRI studies within the larger body of climate and global change research conducted by the USGCRP and other supporting programs

Department of Agriculture

Department of Commerce

Department of Defense

Department of Energy

Department of Health and Human Services

Department of the Interior

Department of State

Department of Transportation

Environmental Protection Agency

National Aeronautics and Space
Administration

National Science Foundation

Smithsonian Institution

U.S. Agency for International Development

US Climate Change
Science Program

www.climatescience.gov



U.S. Climate Change Science Program

- **November 2002** Discussion Draft Plan posted for scientific/public review
- **3-5 December 2002** - CCSP received extensive comments and suggestions during the Climate Science Workshop attended by more than 1,300 climate specialists
- **25 February 2003** - release of National Research Council (NRC) review of CCSP, Dr. Thomas Graedel (committee chair)
- **25 June 2003** - scheduled release of revised CCSP Strategic Plan



NOAA's Mission

To understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs



U.S. Global Change Research Program Act of 1990

Public Law 101-606 (signed by President on 11/16/90)

“An Act To require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions toward international protocols in global change research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,.....

This Act may be cited as the "Global Change Research Act of 1990.....”

U.S. Global Change Research Program (USGCRP)

- **History**
 - Began as a Presidential Initiative in 1989
 - Codified by Congress in the U.S. Global Change Research Act of 1990
- **Funding**
 - FY 2003 - \$1.7 billion
- **Focus**
 - Atmospheric Composition
 - Climate Variability and Change
 - Ecosystems
 - Global Carbon Cycle
 - Global Water Cycle
 - Human Contributions and Responses
 - Land use/Land Cover

Climate Prediction Products

- Current NOAA Research Priorities to Improve Climate Predictions
 - Development of Global Coupled Models
 - Ocean and Coupled Data Assimilation
 - Multi-model Ensemble Seasonal Predictions
 - Routine Attribution of Climate Anomalies
 - Field Programs (EPIC, SALLJ, NAME.....)
 - Climate Process Teams
 - Routine Updates in Reanalysis
 - Common Modeling Infrastructure

Jim Laver, NOAA/CPC