ESTABLISHING PRIORITIES FOR THE OBSERVING SYSTEM

1. CONTEXT
    - Current Goals
    - The NOAA Climate Service

2. ALTERNATIVES FOR SETTING PRIORITIES

3. WHO WILL DECIDE?

CURRENT GOALS

→ OCEANIC

- ROLE OF THE OCEAN IN CLIMATE
- STATE OF THE OCEAN
- STATE OF THE OBSERVING SYSTEM
- STATE OF THE SCIENCE
- PROGRAM PLAN
- MEETINGS
- TEACHER @ SEA
- REPORTS & PRODUCTS

Mission:

Build and sustain a global climate observing system that will respond to the long-term observational requirements of the operational forecast centers, international research programs, and major scientific assessments.

Goals:

* Document long term trends in sea level change
* Document ocean carbon sources and sinks
* Document the ocean's storage and global transport of of heat and fresh water
* Document the ocean-atmosphere exchange of heat and fresh water

→ ATMOSPHERIC

- PROGRAM DESCRIPTION
- MEETINGS & EVENTS
- REPORTS & PRESENTATIONS
- GCOS RENOVATION PROJECTS
- REGIONAL TECH SUPPORT CENTERS
- GCOS RESOURCE LINKS

Mission:

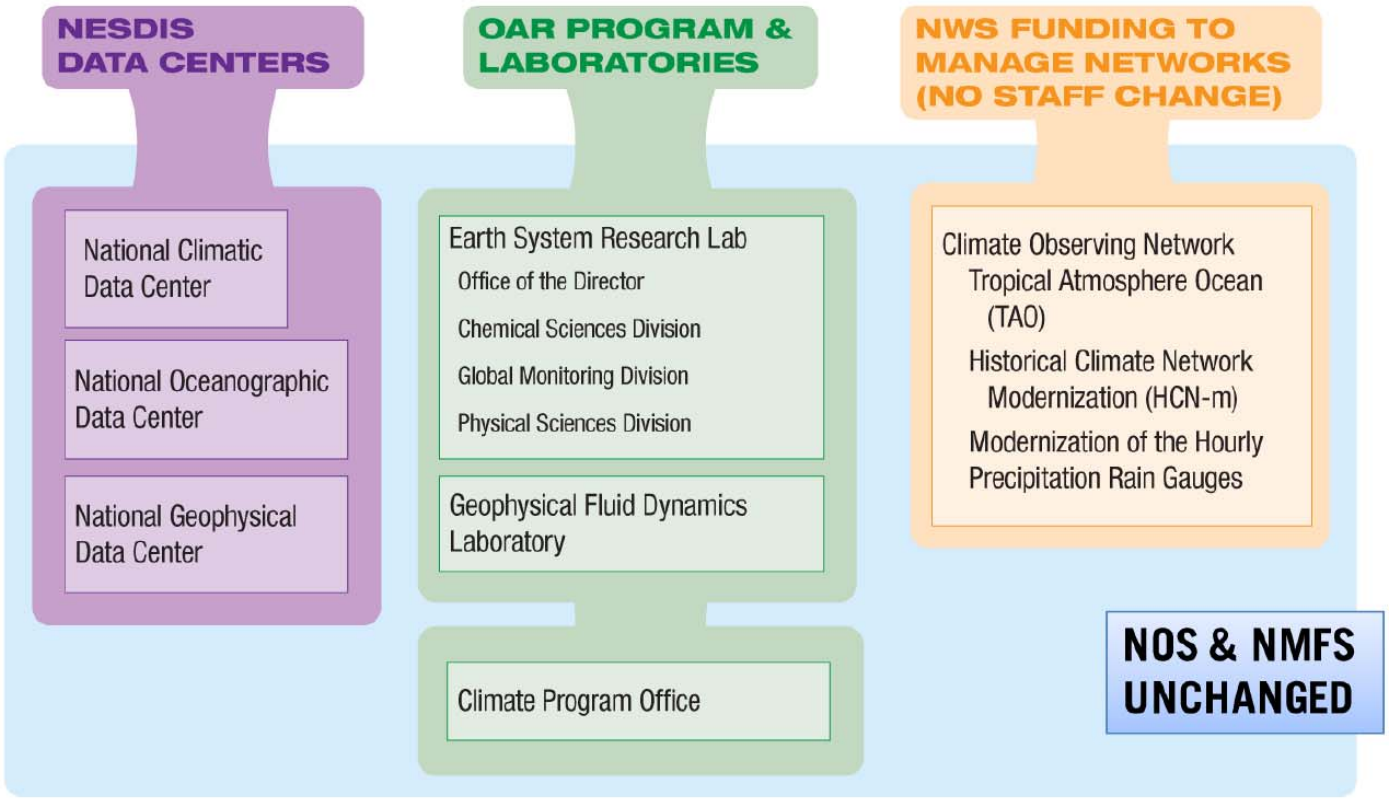
To ensure that the observations and information needed to address climate-related issues are obtained and made available to all potential users.

Goals:

* Monitoring the impacts of and the response to climate change
* Early detection of climate change due to human activity
* Improving data for impact analysis
* Reducing major uncertainties in long-term climate activities

THE NOAA CLIMATE SERVICE

Building Blocks of Proposed NOAA Climate Service



The physical location of these facilities will not change

2. ALTERNATIVES FOR SETTING PRIORITIES

Overall Criteria: USE for Societal Benefit

Climate Impacts

- Ocean Heat Content
- Carbon Sinks
- Sea Level
- SST

Energy from the Ocean: Waves, Winds, Tides

Adaptation

- More about variability than trends
- Requires: Next years climate (Prediction)
  - How variability changes with global warming

Important Ocean Phenomena

- THC and relationship to AMO
- ENSO and Decadal Modulation, PDO
- Annual Cycle, MJO

Observing System Design

Observing System Synthesis

- Analysis, Assimilation

Toward Operations

Toward Climate Records

- The Ten Commandments:

GCOS CLIMATE MONITORING PRINCIPLES

The ten basic principles (in paraphrased form) were adopted by the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) through decision 5/CP.5 at COP-

5 in November 1999. This complete set of principles was adopted by the Congress of the World Meteorological Organization (WMO) through Resolution 9 (Cg-XIV) in May 2003; agreed by the Committee on Earth Observation Satellites (CEOS) at its 17th Plenary in November 2003; and adopted by COP through decision 11/CP.9 at COP-9 in December 2003.

Effective monitoring systems for climate should adhere to the following principles:

1. The impact of new systems or changes to existing systems should be assessed prior to implementation.

2. A suitable period of overlap for new and old observing systems is required.

3. The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e., metadata) should be documented and treated with the same care as the data themselves.

4. The quality and homogeneity of data should be regularly assessed as a part of routine operations.

5. Consideration of the needs for environmental and climate-monitoring products and assessments, such as IPCC assessments, should be integrated into national, regional and global observing priorities.

6. Operation of historically-uninterrupted stations and observing systems should be maintained.

7. High priority for additional observations should be focused on data-poor regions, poorly observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution.

8. Long-term requirements, including appropriate sampling frequencies, should be specified to network designers, operators and instrument engineers at the outset of system design and implementation.

9. The conversion of research observing systems to long-term operations in a carefully-planned manner should be promoted.

10. Data management systems that facilitate access, use and interpretation of data and products should be included as essential elements of climate monitoring systems.

Furthermore, operators of satellite systems for monitoring climate need to:

(a) Take steps to make radiance calibration, calibration-monitoring and satellite-to-satellite cross-calibration of the full operational constellation a part of the operational satellite system; and

(b) Take steps to sample the Earth system in such a way that climate-relevant (diurnal, seasonal, and long-term interannual) changes can be resolved.

Thus satellite systems for climate monitoring should adhere to the following specific principles:

11. Constant sampling within the diurnal cycle (minimizing the effects of orbital decay and orbit drift) should be maintained.

12. A suitable period of overlap for new and old satellite systems should be ensured for a period adequate to determine inter-satellite biases and maintain the homogeneity and consistency of time-series observations.

13. Continuity of satellite measurements (i.e. elimination of gaps in the long-term record) through appropriate launch and orbital strategies should be ensured.

14. Rigorous pre-launch instrument characterization and calibration, including radiance confirmation against an international radiance scale provided by a national metrology institute, should be ensured.

15. On-board calibration adequate for climate system observations should be ensured and associated instrument characteristics monitored.

16. Operational production of priority climate products should be sustained and peer-reviewed new products should be introduced as appropriate.

17. Data systems needed to facilitate user access to climate products, metadata and raw data, including key data for delayed-mode analysis, should be established and maintained.

18. Use of functioning baseline instruments that meet the calibration and stability requirements stated above should be maintained for as long as possible, even when these exist on decommissioned satellites.

19. Complementary in situ baseline observations for satellite measurements should be maintained through appropriate activities and cooperation.

20. Random errors and time-dependent biases in satellite observations and derived products should be identified.

Predictions

- S-to-I, Decadal?

Capacity Building

Enabling Research Through Observing and Analysis Infrastructure