

NOAA's Climate Data Record Project- Update of Status and Plans

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Outline

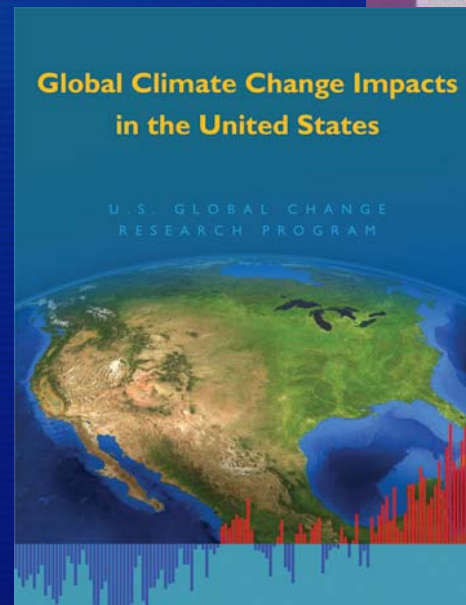
- NOAA's Climate Service new Line Office
- NOAA's Climate Data Record Project
- Transitioning NASA climate sensors to NOAA
- How you can participate

NOAA Climate Service - Some background....

ASSESSMENTS

NOAA support for assessments over recent years includes:

- 9 GCRP Synthesis and Assessment Products
- GCRP Global Climate Change Impacts Report
- IPCC assessments
- All ozone assessments
- State of the Climate Reports



NOAA is creating a new Climate Service Capability and Line Office

NOAA Headquarters and Staff Offices

Under Secretary of Commerce for Oceans and
Atmosphere and Administrator

National
Marine
Fisheries
Service

Assistant
Administrator

National
Ocean
Service

Assistant
Administrator

National
Weather
Service

Assistant
Administrator

National
Environmental
Satellite, Data
and Information
Service

Assistant
Administrator

NOAA Climate
Service

Assistant
Administrator

Office of
Oceanic and
Atmospheric
Research

Assistant
Administrator



Proposed NOAA Climate Service

NESDIS DATA CENTERS

National Climatic
Data Center

National Oceanographic
Data Center

National Geophysical
Data Center

OAR PROGRAM & LABORATORIES

Earth System Research Lab
Office of the Director
Chemical Sciences Division
Global Monitoring Division
Physical Sciences Division

Geophysical Fluid Dynamics
Laboratory

Climate Program Office

NWS FUNDING TO MANAGE NETWORKS (NO STAFF CHANGE)

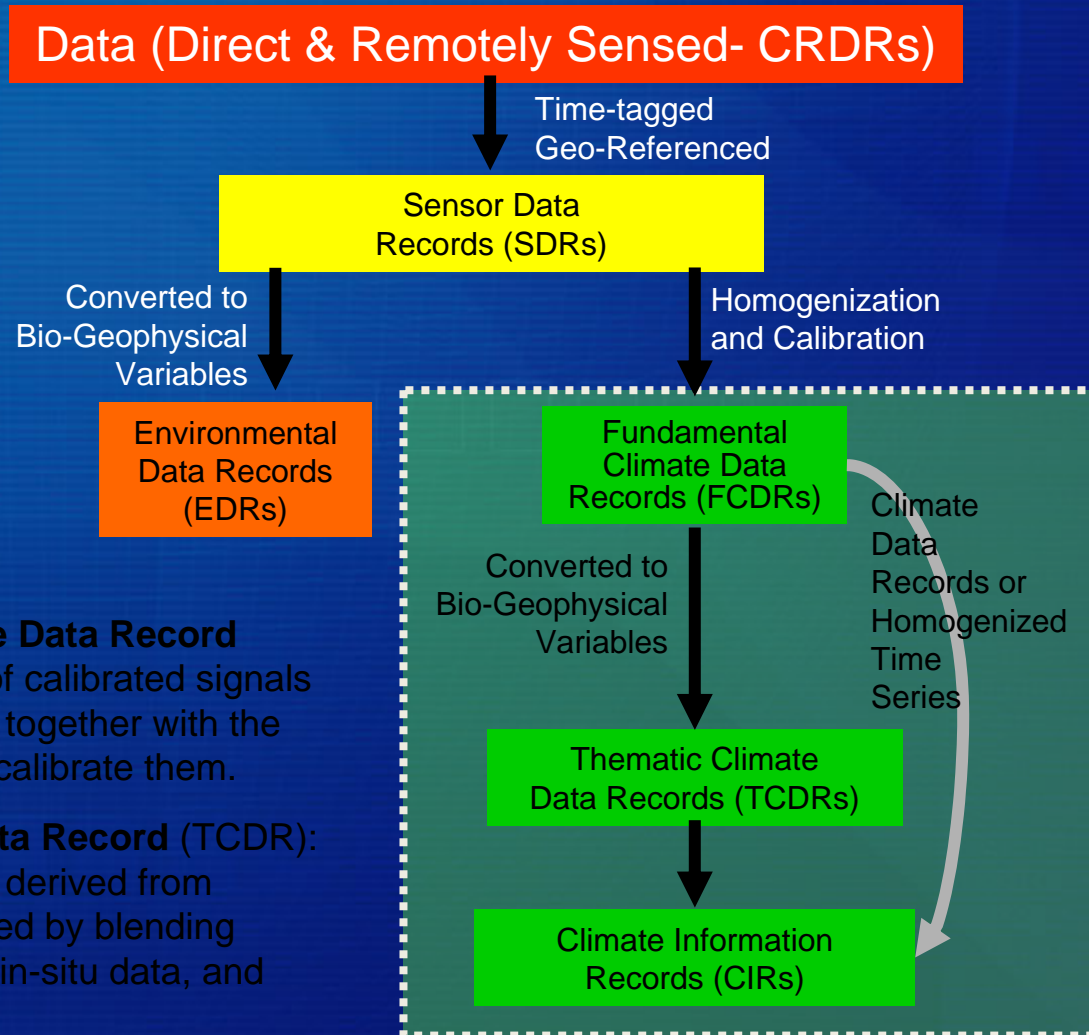
Climate Observing Network
Tropical Atmosphere Ocean
(TAO)
Historical Climate Network
(HCN)
Hourly Precipitation Gauge
Modernization

The physical location of these facilities will not change



CDR Information Flow

Climate Data Records



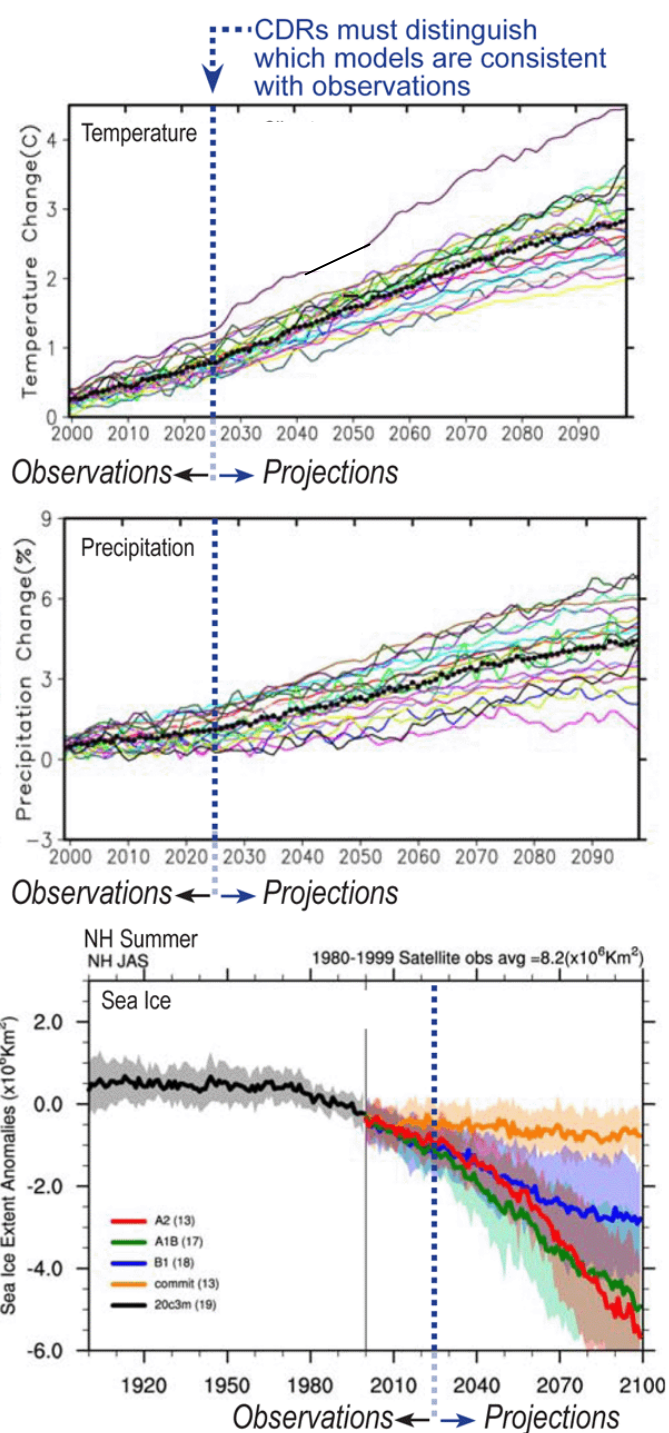
Fundamental Climate Data Record (FCDR): Time series of calibrated signals for a family of sensors together with the ancillary data used to calibrate them.

Thematic Climate Data Record (TCDR): Geophysical variables derived from FCDRs, often generated by blending satellite observations, in-situ data, and model output.

What Climate Trajectory Are We On?

- IPCC model projections for most parameters vary greatly
- Mitigation and adaptation strategies depend on identifying which models are best
- High quality, sustained CDRs are needed to initiate and validate climate model projections

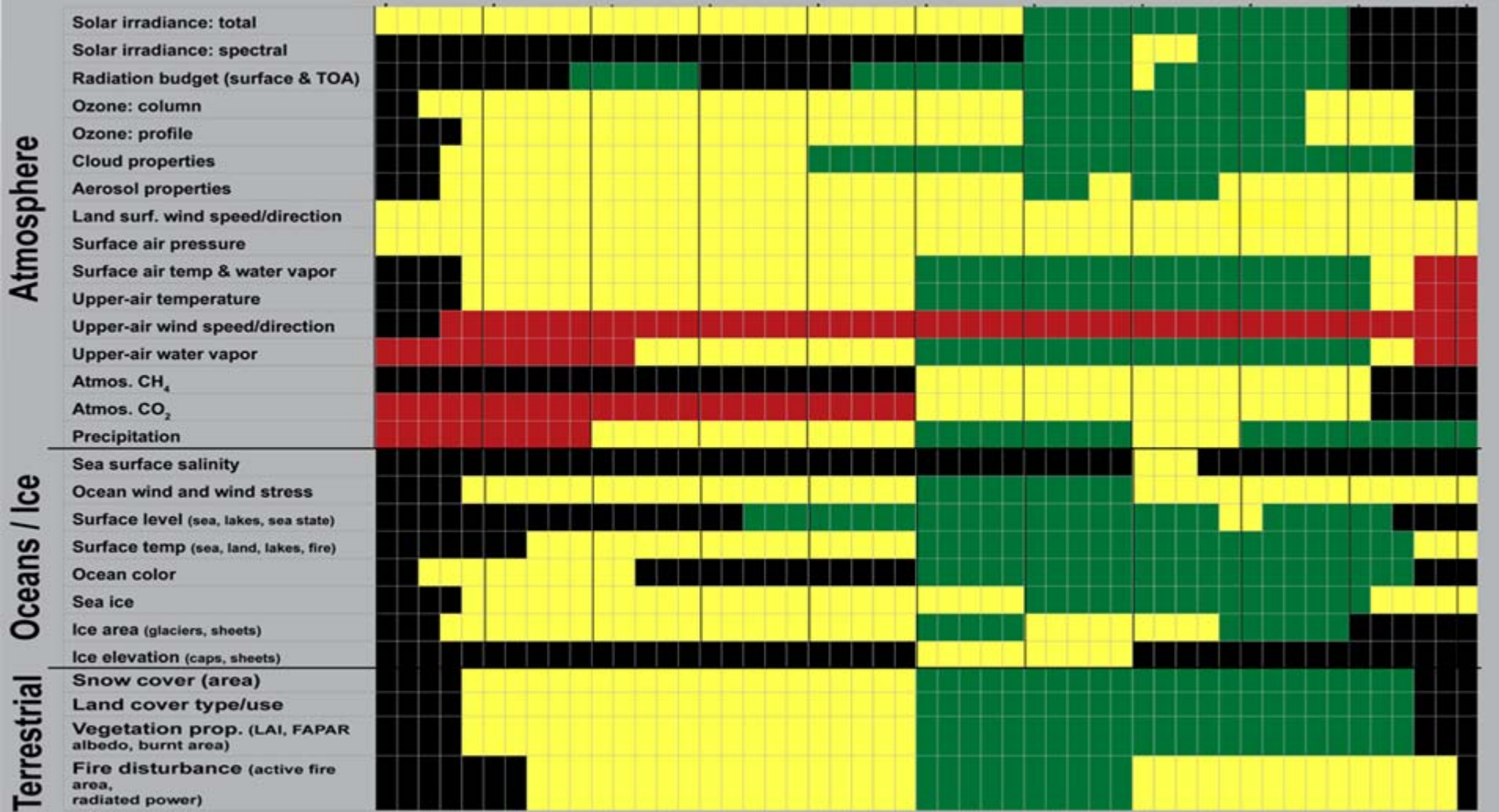
Other uses of CDRs: Detecting, understanding, predicting, and projecting climate change also require long-term records



Combining Multi-Satellite Data Can Unlock Further Climate Information

Global Essential Climate Variables (ECVs) with Heritage Records

1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025



■ Generally considered adequate for developing CDRs
 ■ Usefulness is unknown, application-dependent, or access-dependent
 ■ Generally considered inadequate for developing CDRs
 ■ No viable observations available

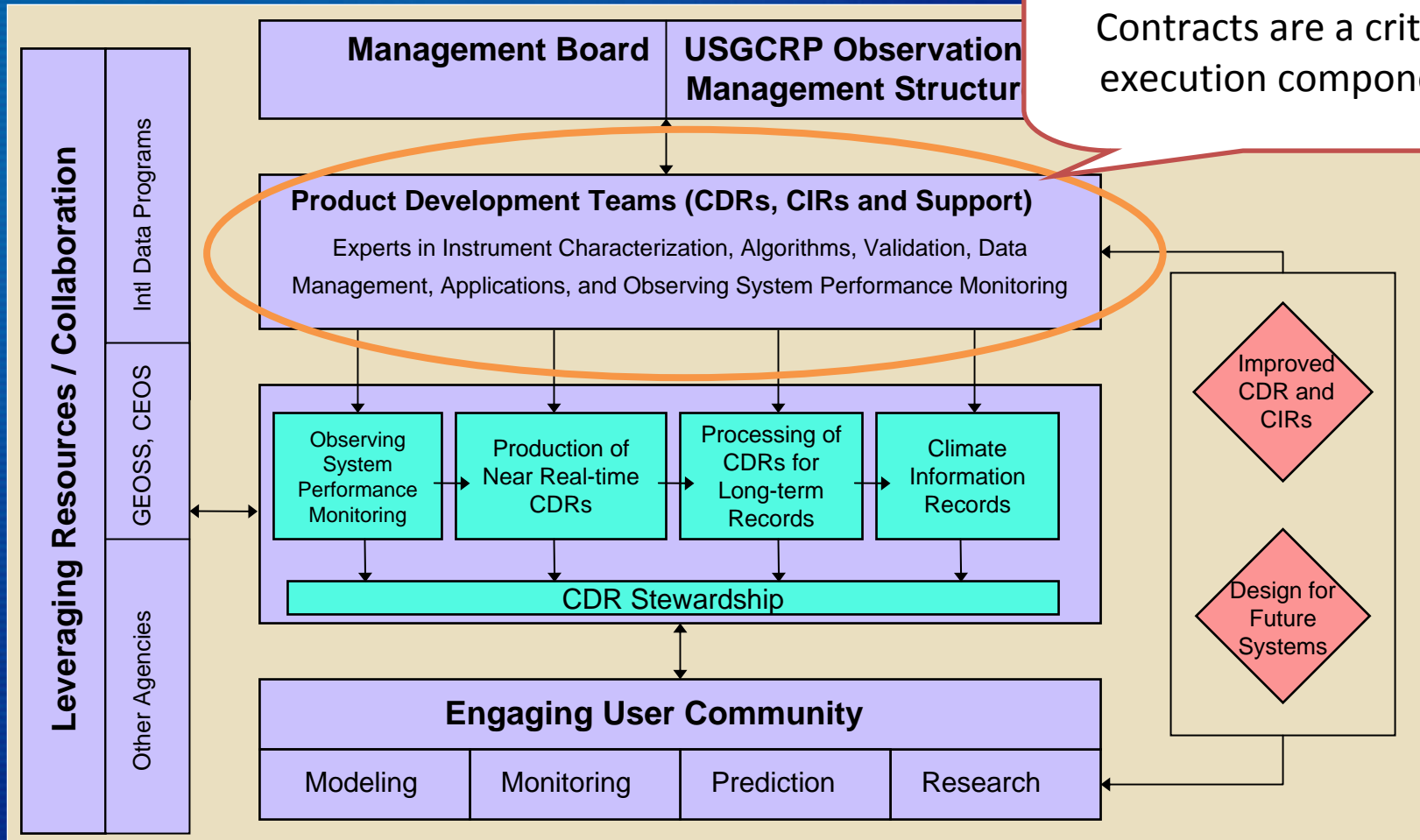
Maturity Matrix Identifies Milestones and Research-to-Operations Transition Points

Daily Optimum Interpolation Sea Surface Temperature

■ : Completed
 ■ : In Process

| Maturity | Sensor Use | Algorithm Stability | Metadata & QA | Documentation | Validation | Public Release | Science & Applications |
|----------|--|---|---|--|---|---|---|
| 1 | Research Mission | Significant changes likely | Incomplete | Draft ATBD | Minimal | Limited data availability to develop familiarity | Little or none |
| 2 | Research Mission | Some changes expected | Research grade (extensive) | ATBD Version 1 | Uncertainty estimated for select locations/times | Data available but of unknown accuracy; caveats required for use. | Limited or ongoing |
| 3 | Research Missions | Minimal changes expected | Research grade (extensive); Meets international standards | Public ATBD; Peer-reviewed algorithm and product descriptions | Uncertainty estimated over widely distribute times/location by multiple investigators; Differences understood. | Data available but of unknown accuracy; caveats required for use. | Provisionally used in applications and assessments demonstrating positive value. |
| 4 | Operational Mission | Minimal changes expected | Stable, Allows provenance tracking and reproducibility; Meets international standards | Public ATBD; Draft Operational Algorithm Description (OAD); Peer-reviewed algorithm and product descriptions | Uncertainty estimated over widely distribute times/location by multiple investigators; Differences understood. | Data available but of unknown accuracy; caveats required for use. | Provisionally used in applications and assessments demonstrating positive value. |
| 5 | All relevant research and operational missions; unified and coherent record demonstrated across different sensors | Stable and reproducible | Stable, Allows provenance tracking and reproducibility; Meeting international standards | Public ATBD, Operational Algorithm Description (OAD) and Validation Plan; Peer-reviewed algorithm, product and validation articles | Consistent uncertainties estimated over most environmental conditions by multiple investigators | Multi-mission record is publicly available with associated uncertainty estimate | Used in various published applications and assessments by different investigators |
| 6 | All relevant research and operational missions; unified and coherent record over complete series; record is considered scientifically irrefutable following extensive scrutiny | Stable and reproducible; homogeneous and published error budget | Stable, Allows provenance tracking and reproducibility; Meeting international standards | Product, algorithm, validation, processing and metadata described in peer-reviewed literature | Observation strategy designed to reveal systematic errors through independent cross-checks, open inspection, and continuous interrogation | Multi-mission record is publicly available from Long-Term archive | Used in various published applications and assessments by different investigators |

CDR Project Functional Framework



Competed Grants and Contracts are a critical execution component

NOAA Climate Sensors Background (1 of 3)

- From January to June 2006, the NPOESS program underwent a Nunn-McCurdy Certification process that resulted in the program being restructured over the next two years
 - The Nunn-McCurdy Congressional certification process was a Tri-Agency process
 - The resulting Acquisition Decision Memorandum (ADM) of the Department of Defense (DoD) outlined the nature of the restructured Program
 - De-manifested Earth Radiation Budget Sensor (ERBS), TSIS, Altimeter, Space Environment Sensor Suite (SESS), Aerosol Polarimeter Sensor (APS) and Survivability sensor (SUS)
 - Directed NPOESS fly with Space Environment Monitor and CERES sensors instead of ERBS and SESS
 - De-manifested the OMPS Limb sensor from both the NPOESS Preparatory Project (NPP) and NPOESS 1330 satellite

NOAA Climate Sensors Background (2 of 3)

- In January 2007, NOAA and NASA drafted a white paper called *“Impacts of NPOESS Nunn-McCurdy Certification on joint NASA-NOAA Climate Goals”*
 - Described impacts of the NPOESS Nunn-McCurdy Certification on the climate program goals of NASA and NOAA
 - Provided recommended approaches for recovering the impacted climate observations and related science
- In April 2007, NASA and NOAA announced a plan to restore OMPS-Limb to NPP
- In January 2008, NASA and NOAA selected the CERES Flight Model (FM) 5 sensor for flight on NPP
- In May 2008, the NPOESS tri-agency Executive Committee agreed to restore the Total Solar Irradiance Sensor (TSIS) to NPOESS C1
- A 2008 National Research Council (NRC) Report: *“Ensuring the Climate Record from the NPOESS and GOES-R Spacecraft”*, recommended sustaining the following sensors considered relevant to Climate Science:
 - Altimeter; CERES / ERBS; TSIS; APS; OMPS-Limb

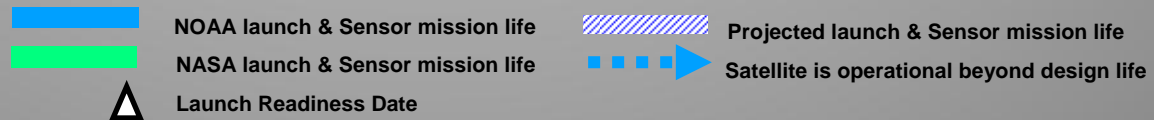
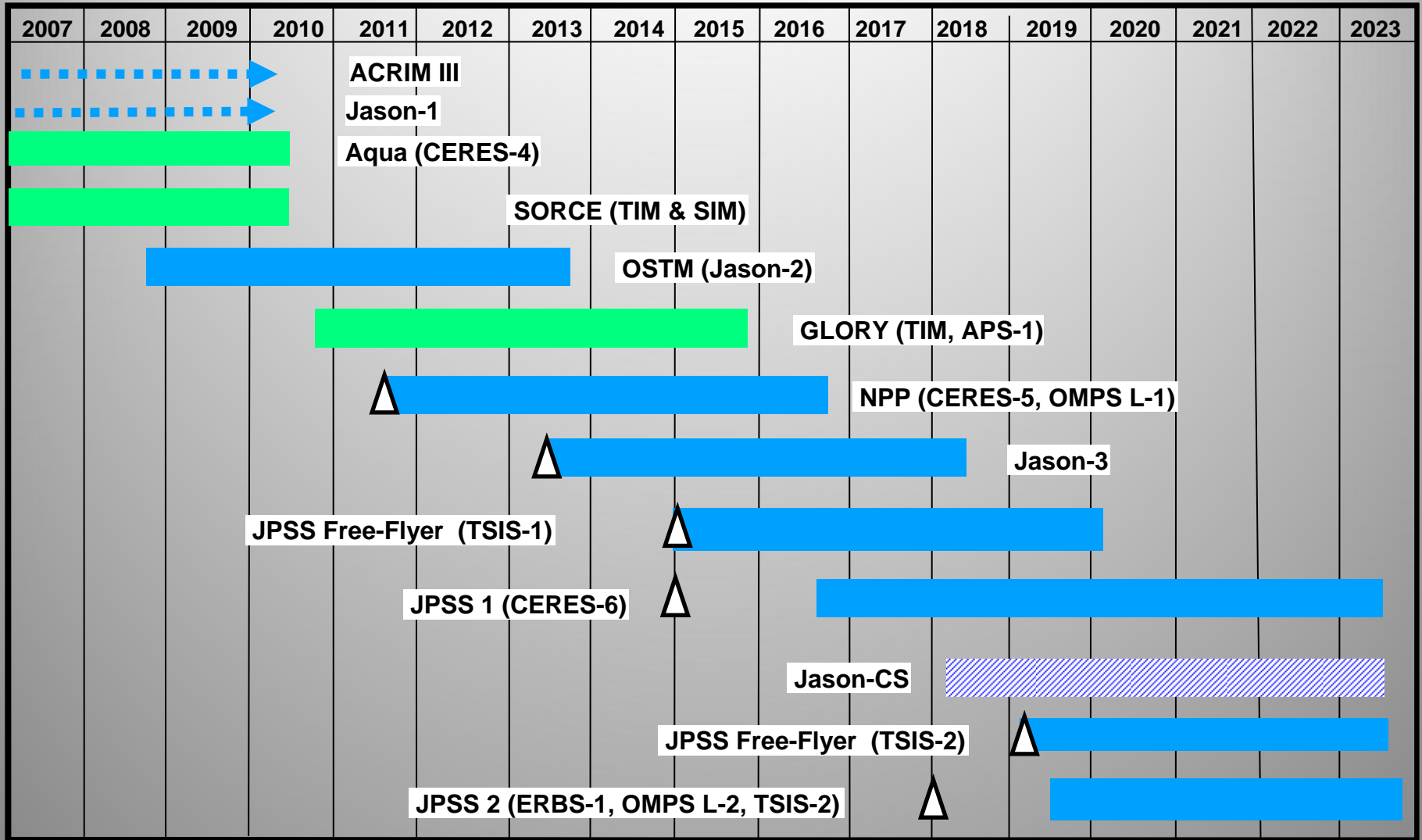
NOAA Climate sensors Background (3 of 3)

- In February 2010, the President's FY 2011 budget request for NOAA directed the NPOESS program to split into separate NOAA/NASA and DoD programs
 - NOAA/NASA Joint Polar Satellite System (JPSS) covers the afternoon (1330) orbit
 - JPSS flies an "NPP-like" satellite bus
 - DoD covers the early morning (0530) orbit
 - NOAA manages the JPSS ground system

Climate Sensor Planning Schedule

For Official Use Only
NOAA Pre-Decisional Information

Calendar Year



How you can participate

- NPP Climate Raw Data Record (CRDR)
 - NPP/JPSS formats are very difficult
 - CRDR will reformat to easy NetCDF CF for easy use in reprocessing
 - Join us by evaluating beta software
- We have jobs, Jobs, JOBS
 - 5 federal jobs – U.S. Citizens only
 - New Cooperative Institute for Climate and Satellites (CICS-NC) - 15 jobs – post-docs, scientists, visiting scientists
- We are funding Grants
 - June Announcement - \$2.5M in new starts
 - \$5M/yr ongoing grants

Thank you.

Questions

