



NPOESS Preparatory Project (NPP) & Visible Infrared Imaging Radiometer Suite (VIIRS)

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National Polar Orbiting Environmental Satellite System (NPOESS) Preparatory Project (NPP)



NPP is the bridge mission between the NASA Earth Observing System (EOS) research satellites and the NPOESS operational environmental satellite system.

NPP will provide continuity of the research-quality time series data products started with NASA's EOS missions (i.e., Terra, Aqua, Aura).

The NPOESS system is being developed to provide both “operational” data, for weather forecasting and real-time applications as well as “climate-quality” (= research-quality) data for long-term, multi-satellite, measurements of key environmental parameters.



NPP Science Goals



NPP will continue the time series of moderate-resolution climate-quality observations of:

- atmospheric ozone (**OMPS**)
- clouds and **aerosols** (**VIIRS**)
- land cover and vegetation biophysical properties (**VIIRS**)
- **ocean biological and biogeochemical properties** (**VIIRS**)
- sea and land surface temperatures (**VIIRS**)
- temperature and moisture profiles in the atmosphere (**CrIS/ATMS**)

➔ NPP will enable inter-comparison and cross-calibration of selected EOS and NPOESS measurements to ensure a climate-quality time series

➔ These observations are needed for work in support of Presidential Initiatives on Climate Change Research, the U.S. Integrated Earth Observation System, and the Ocean Action Plan. The ozone observations are Congressionally mandated.



NPP Science Team (2008-2011)



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- Aumann**, Harmut, JPL, radiometric validation of CrIS
- Baum**, Bryan, U. Wisconsin, cloud parameter time series
- Blackwell**, William, MIT Lincoln Lab, alg. & cal/val for ATMS
- Campbell**, Janet, U. New Hampshire, chlorophyll data record
- Chance**, Kelly, Smithsonian, ozone & trace gas records
- Csiszar**, Ivan, U. Maryland, active fires
- Evans**, Robert, U. Miami, alg. & cal. sea surface temperature
- Friedl**, Mark, Boston U., land cover & dynamics
- Gao**, Bo-Cai, NRL, cirrus cloud, aerosol, & SST products
- Goldberg**, Mitchell, NOAA, cloud-cleared radiances
- Hook**, Simon, JPL, validation mid and thermal infrared data
- Hsu**, N. Christina, NASA GSFC, aerosol time series
- Huete**, Alfredo, U. Arizona, Vegetation Index time series
- Justice**, Chris, U. Maryland, global burned area
- Lambrigtsen**, Bjorn, JPL, cal./optimization of ATMS, CrIMSS



NPP Science Team (2008-2011)



Lyapustin, Alexei, UMBC, surface reflectance
Maritorena, Stephane, UCSB, ocean color data records
Maslanik, James, U. Colorado, sea ice products
McClain, Charles, NASA GSFC, ocean color & SST records
McPeters, Richard, NASA GSFC, ozone data records
Menzel, Paul, U. Wisconsin, decadal cloud climatology
Minnett, Peter, U. Miami, sea surface temperature record
Morisette, Jeffrey, NASA GSFC, cal/val consultation
Myneni, Ranga, Boston U., LAI & FPAR time series
Rault, Didier, NASA LaRC, OMPS limb ozone record
Revercomb, Henry, U. Wisconsin, IR radiances (CrIS, VIIRS)
Schaaf, Crystal, Boston U., albedo products
Stone, Thomas, USGS, calibration using the moon
Stroeve, Julianne, U. Colorado, arctic sea ice albedo
Strow, Lawrence, UMBC, IR radiance from CrIS



NPP Science Team (2008-2011)



Torres, Omar, UMBC, aerosol absorption record

Tsay, Si-Chee, NASA GSFC, aerosol retrievals

Vermote, Eric, U. Maryland, surface radiation products

Wan, Zhengming, UCSB, land surface temperature & emissivity

Wang, Menghua, NOAA, atm. corr. For ocean color products

Wolfe, Robert, NASA GSFC, geolocation algorithms

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Time Series Data to Reveal Global Change



Satellites: POES → EOS → **NPP** → NPOESS

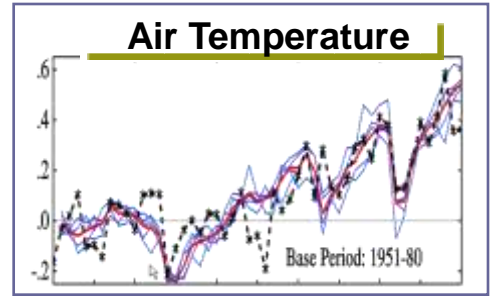
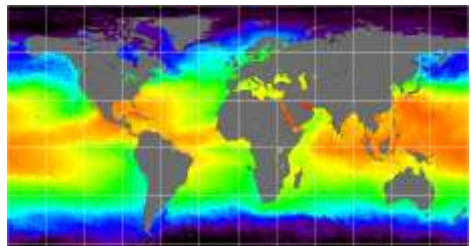
How is the global Earth system changing?

- atmospheric temperature and moisture profiles
- variability in surface temperature
- primary productivity patterns

How does the Earth System respond to natural and human-induced changes?

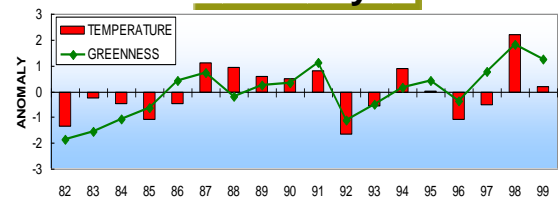
- ecosystem responses to climate
- ozone layer recovery
- changes in clouds and aerosols

Sea Surface Temperature

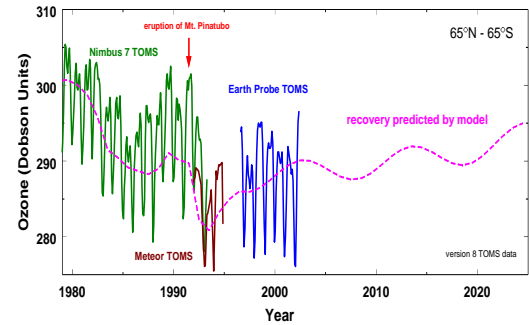


Atmospheric Sounding

Vegetation and T Anomalies by Year



Multispectral Imaging / Surface Biophysical Properties



Total Ozone Monitoring

Measured and Modeled Ozone



NPP Recent Developments



- Launch re-baselined to June 2010
- Budget re-profiled
- Some climate sensors restored:
 - OMPS Limb restored
 - CERES added
- PEATEs asked to help scope potential data production options



NPP Science Team: Activities & Issues



- Status of the EDRs: what we do and do not know about their character and quality for science
 - need a concise summary; HQ briefing
- Shared MODIS & VIIRS ESDR funding; how to achieve the “right” balance
- NASA’s role in calibration & validation of VIIRS; what does the NPP Science team need to do to evaluate the EDRs; what type of support should NASA provide to the IPO
- NPP Science Team fate post-launch of NPP
 - Launch 6/10; current awards through 11/10-1/11
- Role of the PEATEs: what they are charged to do, what they are able to do, and what they may or may not be asked to do in the future
- NASA science role when NPOESS C1 launches



NPP Science Team: This Meeting



- Let's re-engage regarding NPP and its EDRs
 - ensure we agree on who is involved, doing what
 - plan a concise summary of what we have learned so far
- Let's share our plans for ESDRs
- Let's get any other concerns or issues regarding near-term implementation out and resolved
- Let's talk about the continuity of systematic observations
 - try to focus on what is needs to be done (more than on who does it)
 - think about long-term priorities