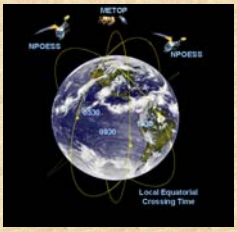
National Polar-orbiting Operational Environmental Satellite System (NPOESS)

NPOESS System Overview

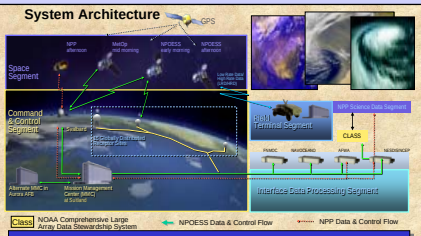
Tri-agency Effort to Leverage and Combine Environmental Satellite Activities

Mission

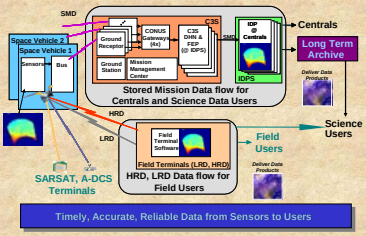
- Provide a national, operational, polar-orbiting remote-sensing capability
- Converge DoD and NOAA satellite programs
- Incorporate new technologies from NASA
- Enhance international cooperation



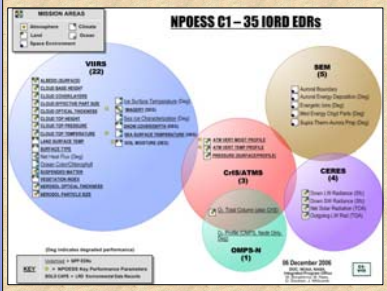
System Architecture



Mission Data Flow



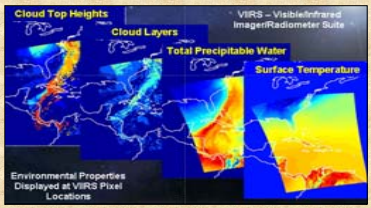
Environmental Data Records (EDRs)



EDRs are dependent on orbits.

NPOESS Products

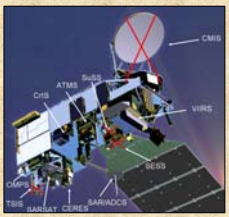
Environmental Data Records



NPOESS Preparatory Project (NPP)

- Instrument Risk Reduction – 2009 Launch
  - Early delivery / instrument-level test/system-level integration & test
    - VIIRS - Vis/IR Imager Radiometer Suite
    - CrIS - Cross-track IR Sounder
    - ATMS - Advanced Technology Microwave Sounder
    - OMPS – Ozone Mapping and Profile Suite
  - Provides lessons learned and allows time for any required modifications before NPOESS first launch
- Ground System Risk Reduction
  - Early delivery and test of a subset of NPOESS-like ground system elements
  - Early User Evaluation of NPOESS data products
  - Provides algorithms / instrument verification and opportunities for instrument calibration / validation prior to first NPOESS launch
  - Allows for algorithm modification prior to first NPOESS launch
- Continuity of data for NASA's EOS Terra/Aqua/Aura missions

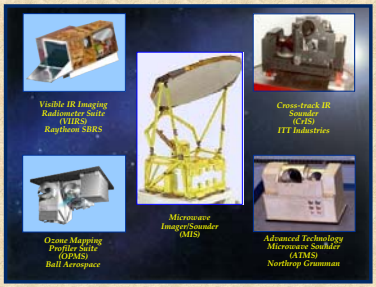
Space Segment



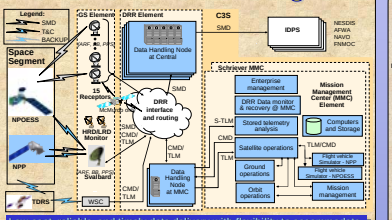
	PM	AM	NPP
VIIRS	X	X	X
CMIS	O	O	
MIS (Rep)	C-3	X	
CrIS	X	O	X
ATMS	X	O	X
OMPS	N		X
SESS	O	O	
SEM (Rep)	X		
ADCS	X	X	
SARSAT	X	X	
CERES	C-1		
ERBS	O		
TSIS		O	
ALT		O	
SuSS	O	O	

O = demanifested by Nunn McCurdy
N = Nadir sensor only
REP = Replaces

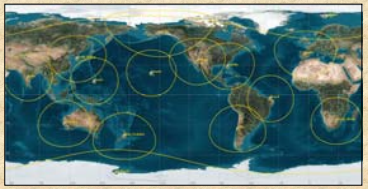
- VIIRS — Visible / Infrared Imager / Radiometer Suite
- CrIS — Cross-track Infrared Sounder
- ATMS — Advanced Technology Microwave Sounder
- OMPS — Ozone Mapping and Profiler Suite
- MIS — Microwave Imager Sounder
- A-DCS — Advanced Data Collection System
- SARSAT — Search and Rescue Satellite-Aided Tracking Tracking
- CERES — Cloud and Earth's Radiant Energy System
- SEM — Space Environment Monitor



Command, Control and Communications (C3) Segment



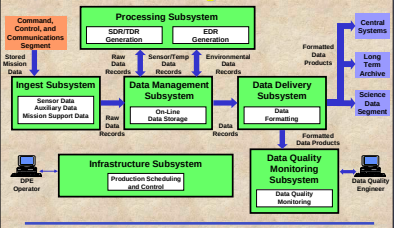
Low-cost, reliable, and timely data delivery with flexibility to accommodate system growth and technology insertion



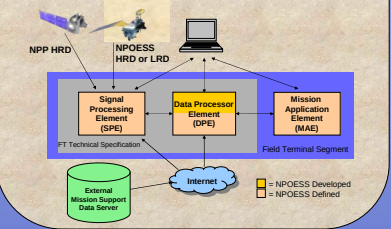
SafetyNet -- 15 globally distributed SMD receptors linked to the centrals via commercial fiber -- enables low data latency and high data availability

IDPS/FTS

Interface Data Processing



Field Terminal Segment

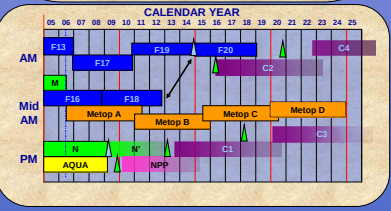


Protect Safety of Life and Property

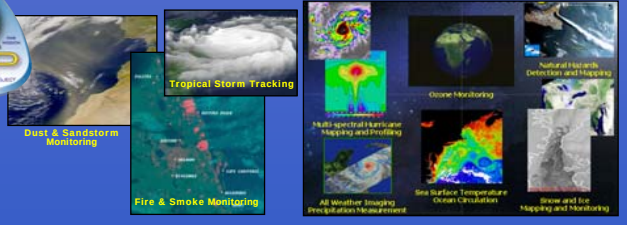
Improve prediction of wind speed and direction.

Increase in hurricane landfall forecast skill will save an estimated $1 million per mile of coastline that does not have to be evacuated.

Improved early warnings mitigate the devastating effects of floods through disaster planning and response.



Benefits for Many Countries & Disciplines



Improve Accuracy of Severe Weather Warnings

www.npoess.noaa.gov