

Observing Earth

A Brief Introduction to Earth Data

Andrew Pawloski
Element 84

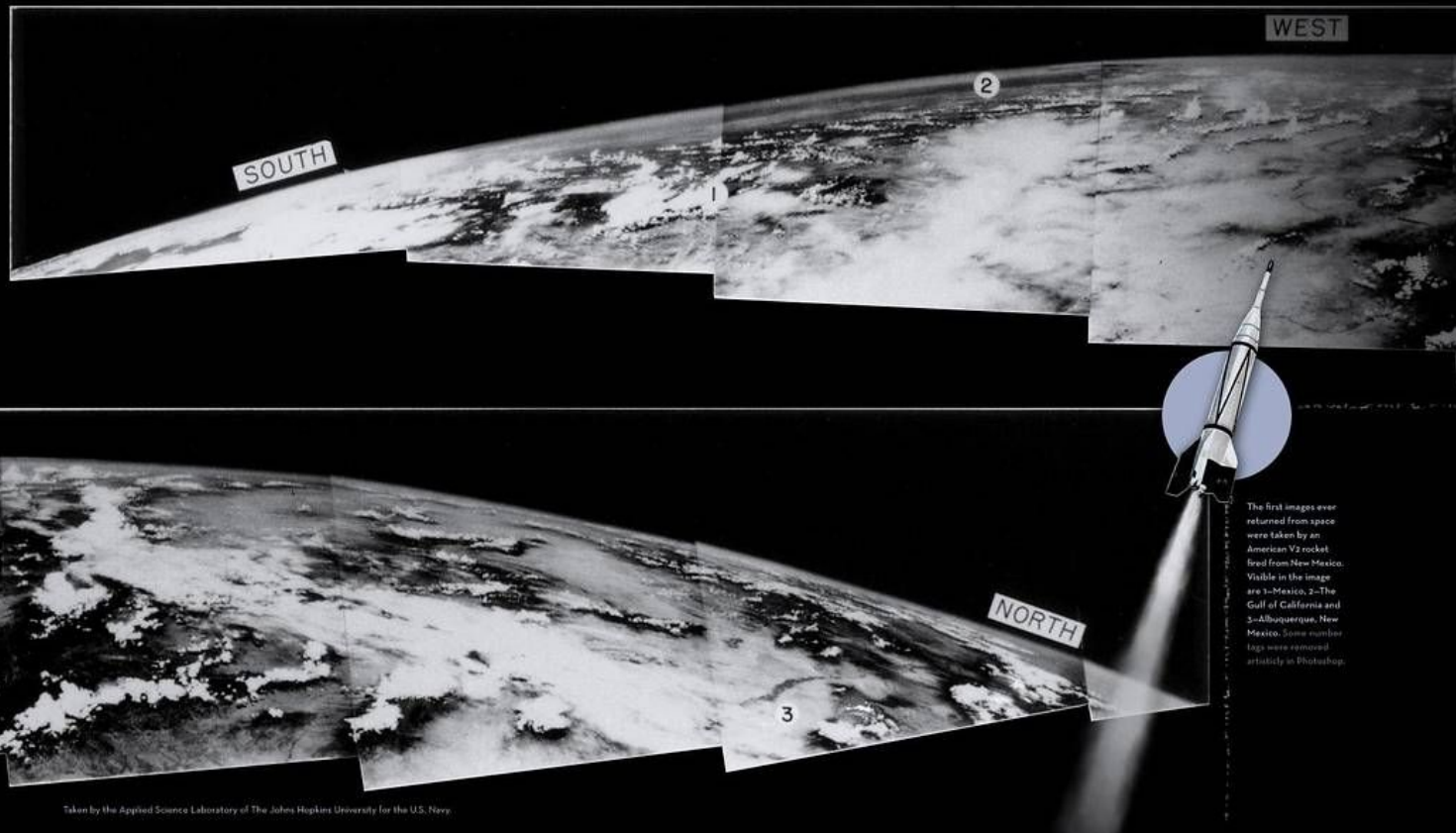


SMALLSTEPS

MISSION : V2 ROCKET FIRED AT WHITE SANDS PROVING GROUND
TARGET : NEAR EARTH SPACE

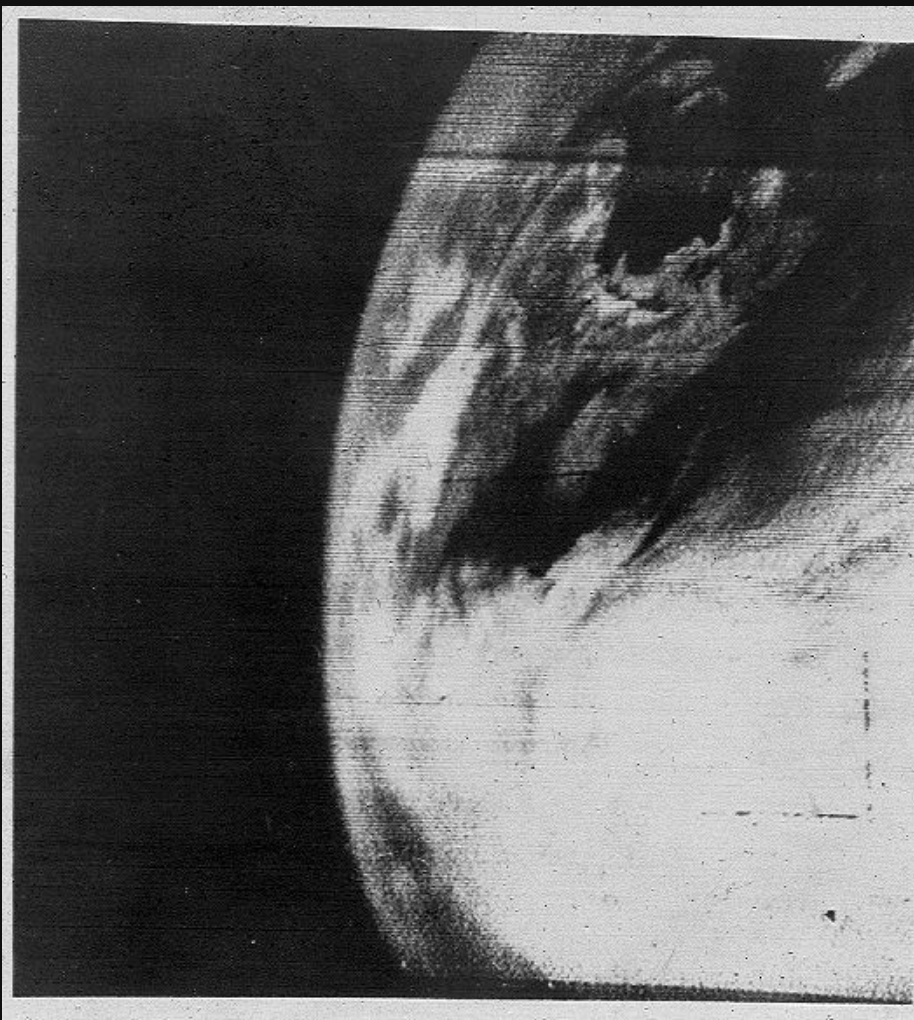


1948



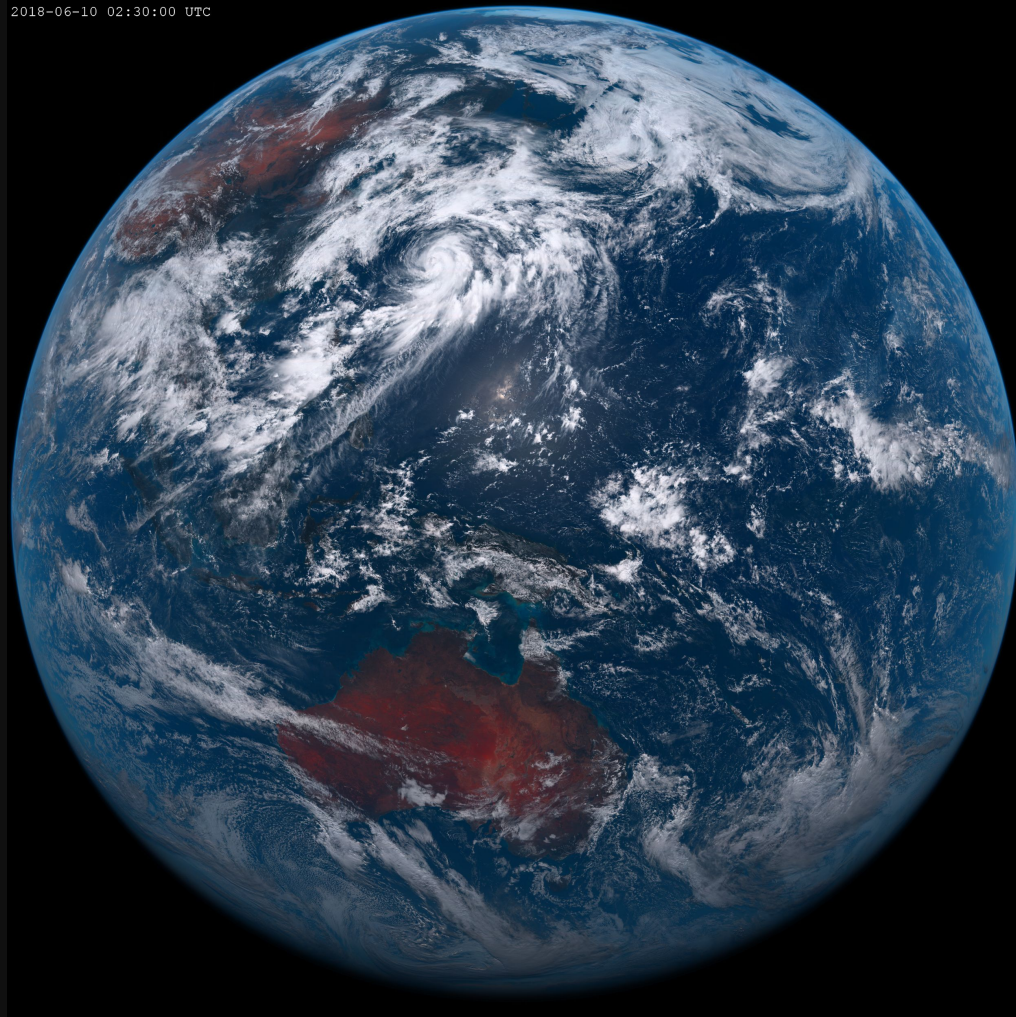
The first images ever returned from space were taken by an American V2 rocket fired from New Mexico. Visible in the image are 1-Mexico, 2-The Gulf of California and 3-Albuquerque, New Mexico. Some number tags were removed artistically in Photoshop.

Taken by the Applied Science Laboratory of The Johns Hopkins University for the U.S. Navy.





2018-06-10 02:30:00 UTC



Earth data is a national asset.

Earth Science Missions

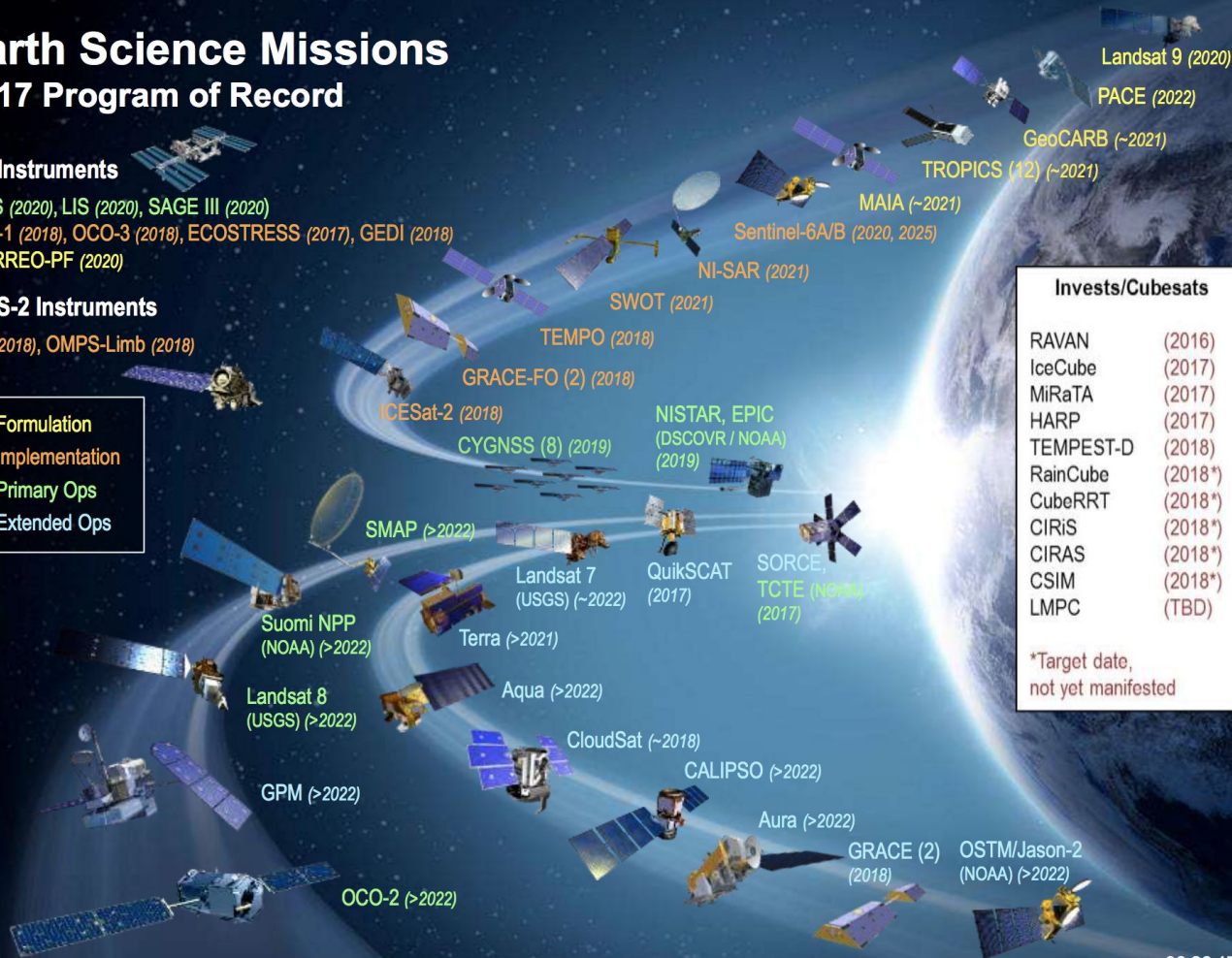
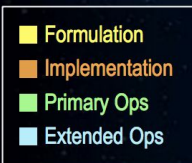
FY17 Program of Record

ISS Instruments

CATS (2020), LIS (2020), SAGE III (2020)
 TSIS-1 (2018), OCO-3 (2018), ECOSTRESS (2017), GEDI (2018)
 CLARREO-PF (2020)

JPSS-2 Instruments

RBI (2018), OMPS-Limb (2018)



Earth Science Missions

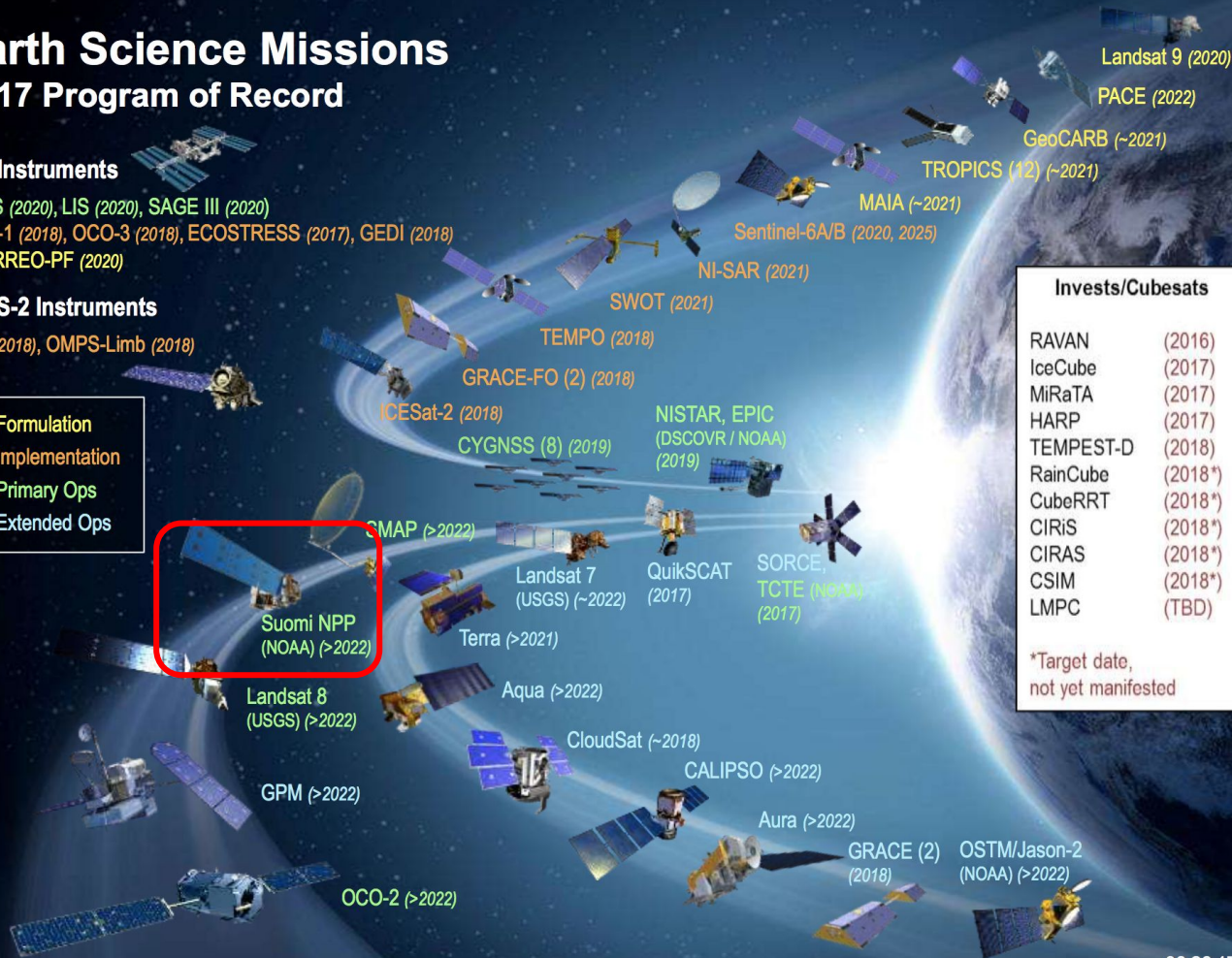
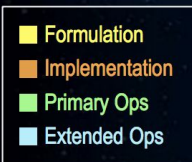
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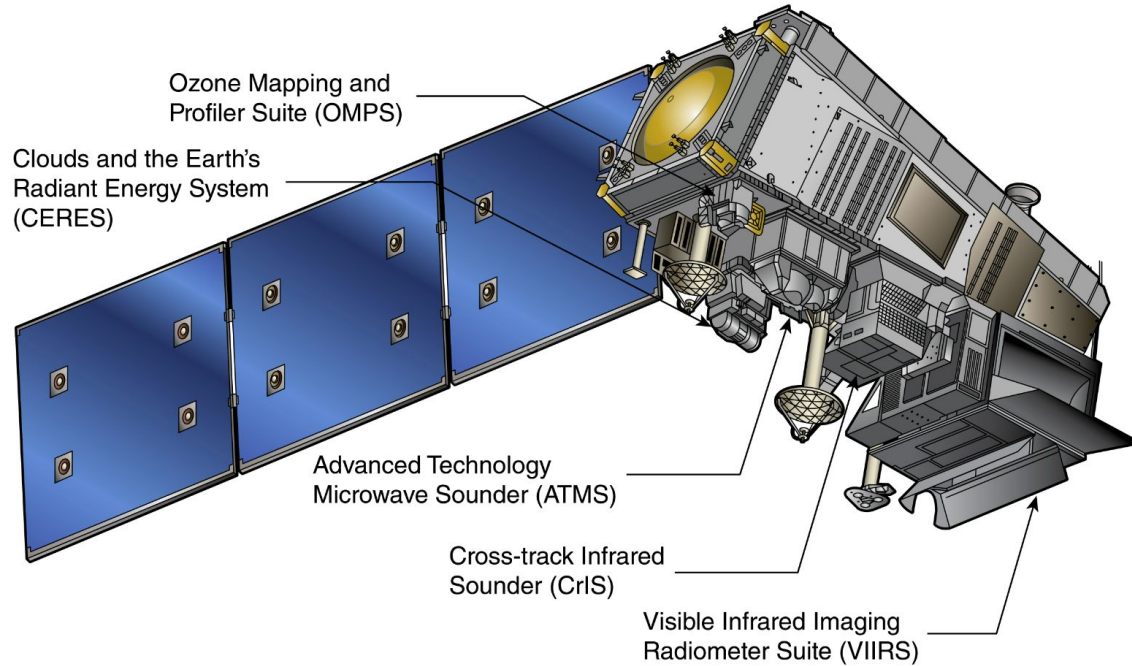


Invests/Cubesats

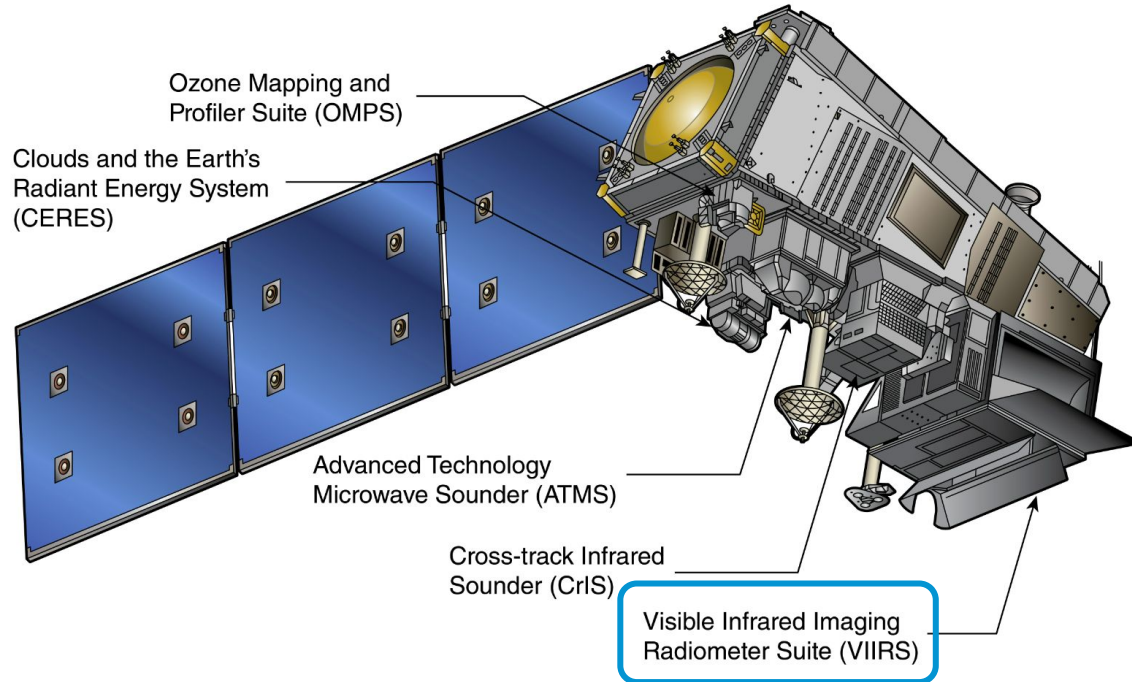
RAVAN	(2016)
IceCube	(2017)
MiRaTA	(2017)
HARP	(2017)
TEMPEST-D	(2018)
RainCube	(2018*)
CubeRRT	(2018*)
CIRIS	(2018*)
CIRAS	(2018*)
CSIM	(2018*)
LMPC	(TBD)

*Target date,
not yet manifested

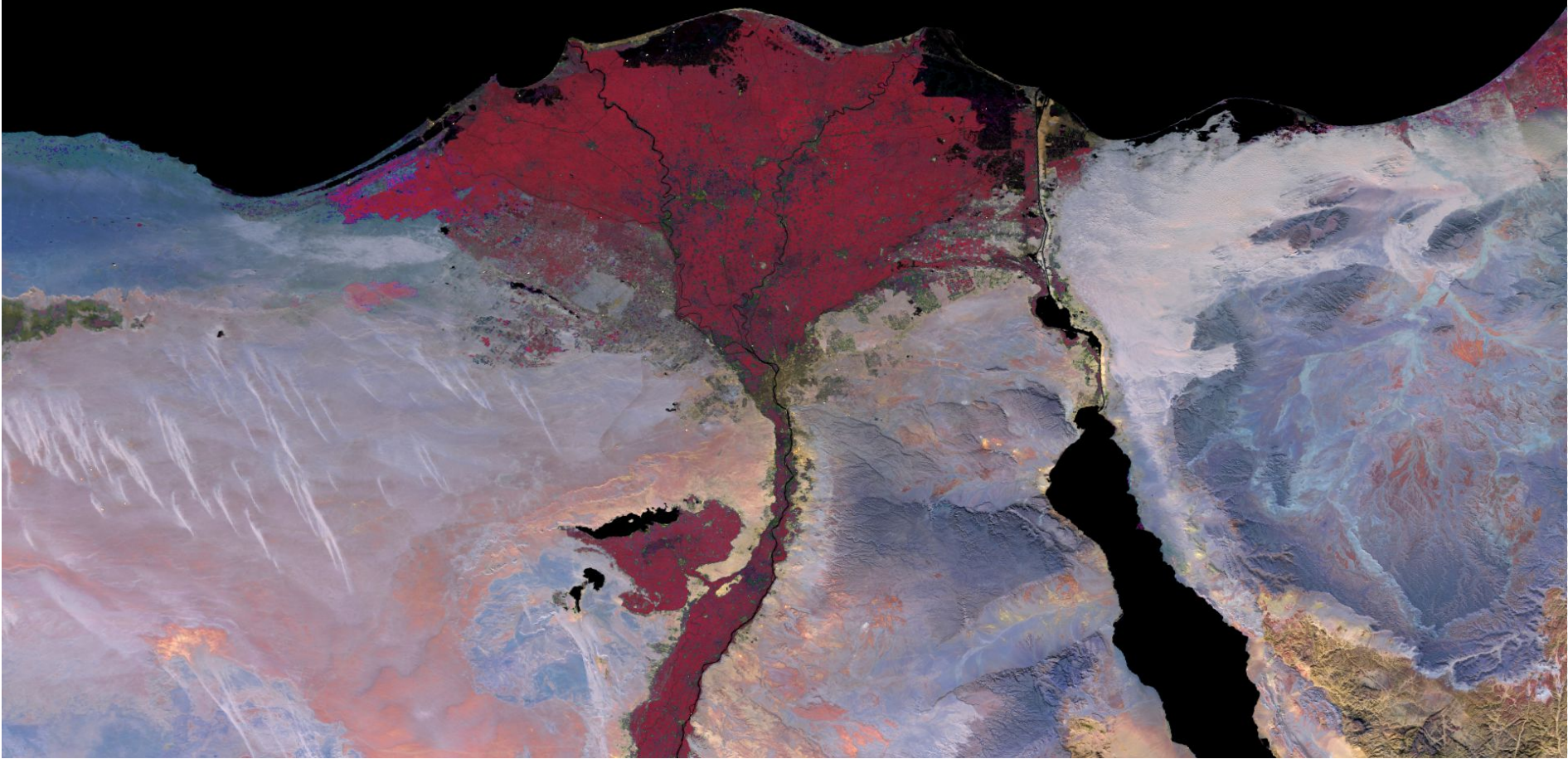
Suomi NPP

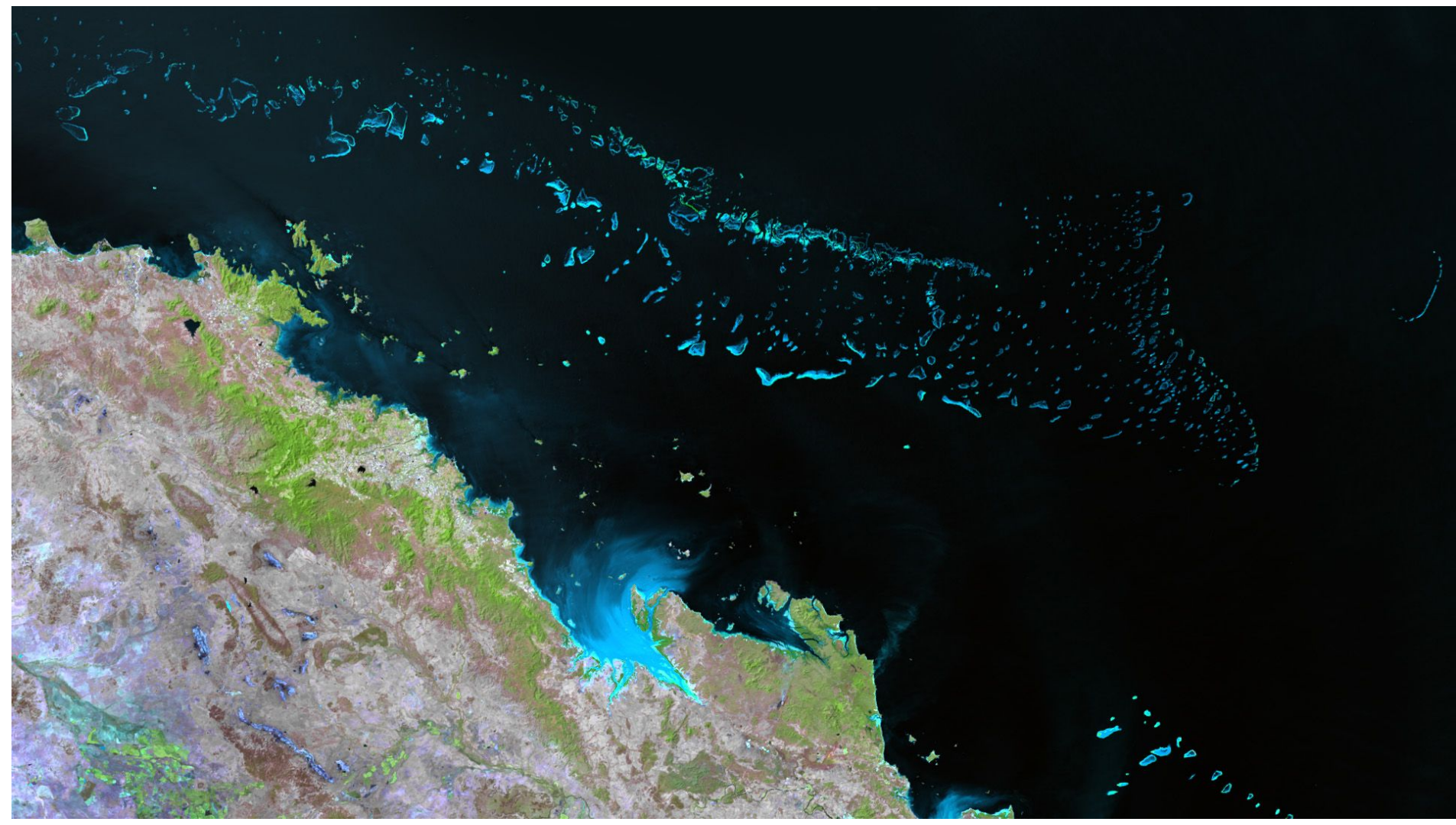


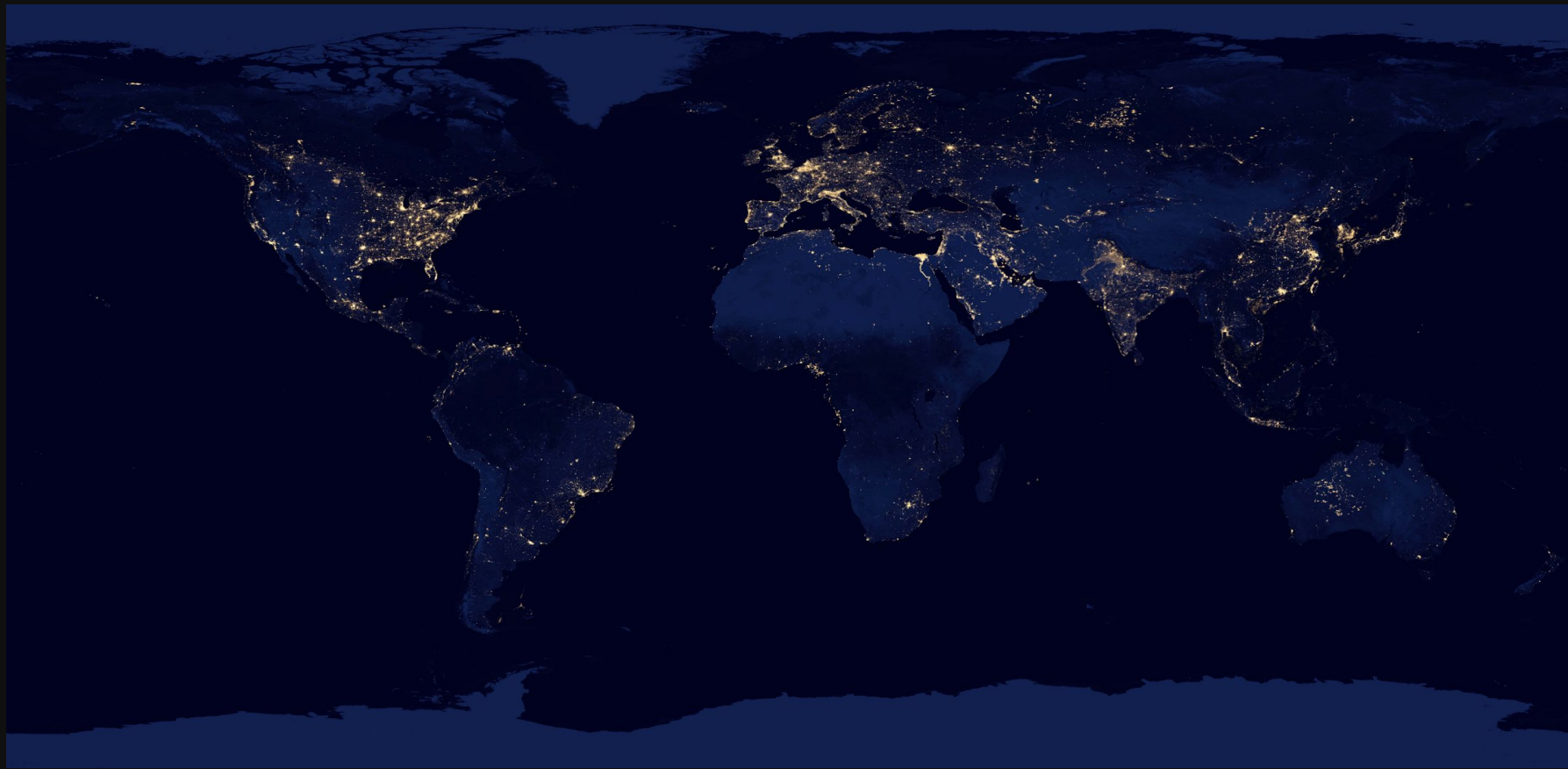
Suomi NPP











VIIRS Nighttime Imagery

Potential of NPP-VIIRS Nighttime Light Imagery for Modeling the Regional Economy of China

Xi Li ^{1,*}, Huimin Xu ², Xiaoling Chen ¹ and Chang Li ³

Night-time Imagery as a Tool for Global Mapping of Socioeconomic Parameters and Greenhouse Gas Emissions

[Christopher N. H. Doll](#), [Jan-Peter Muller](#), [Christopher D. Elvidge](#)

Royal Swedish Academy of Sciences

Detection of rural electrification in Africa using DMSP-OLS night lights imagery

[Brian Min](#) ✉, [Kwawu Mensan Gaba](#), [Ousmane Fall Sarr](#) & [Alassane Agalassou](#)

Pages 8118-8141 | Received 22 Apr 2013, Accepted 27 Jul 2013, Published online: 17 Sep 2013

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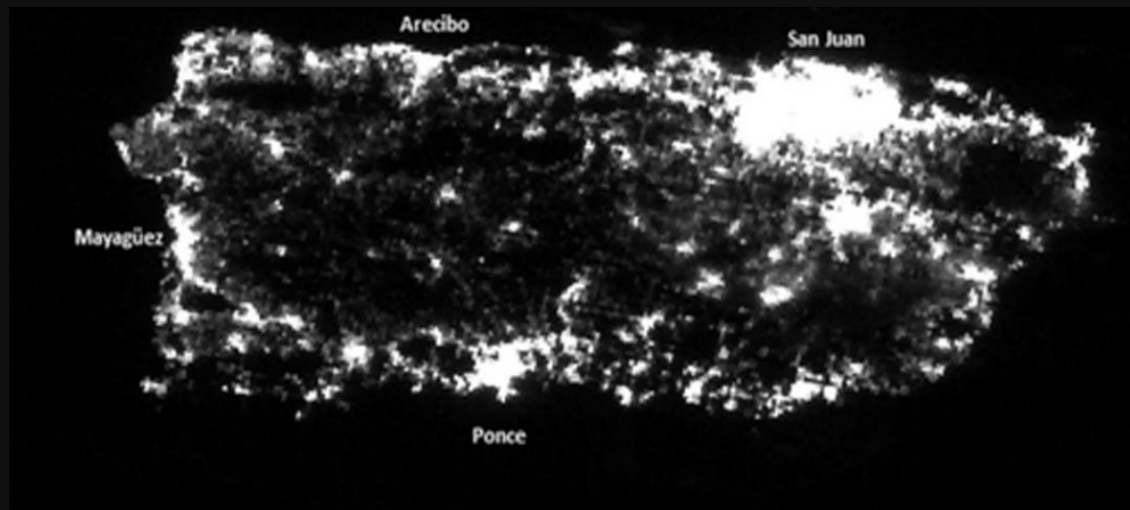
(Not VIIRS) - - - - -

Detection of rural electrification in Africa using DMSP-OLS night lights imagery

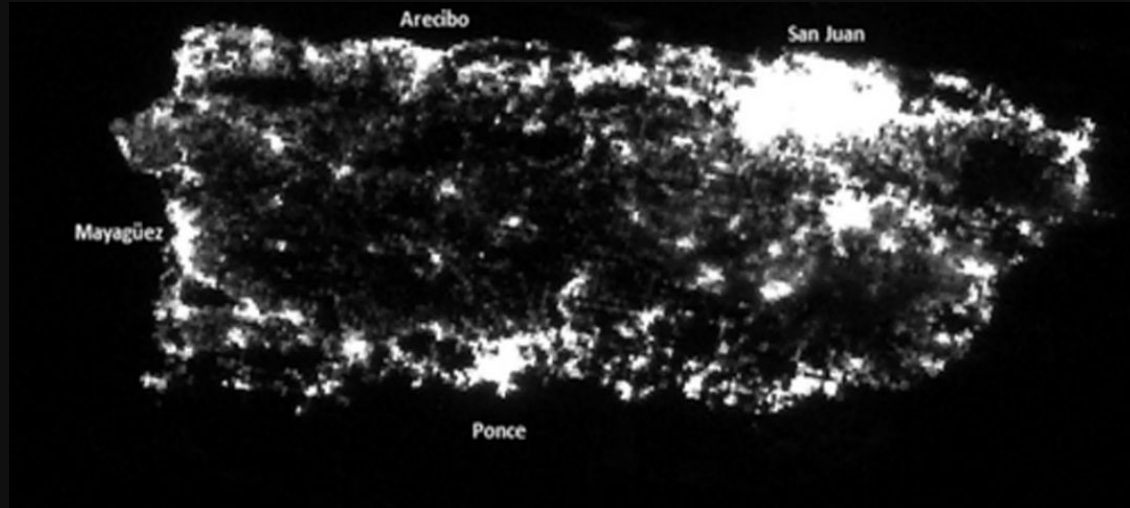
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VIIRS - Puerto Rico

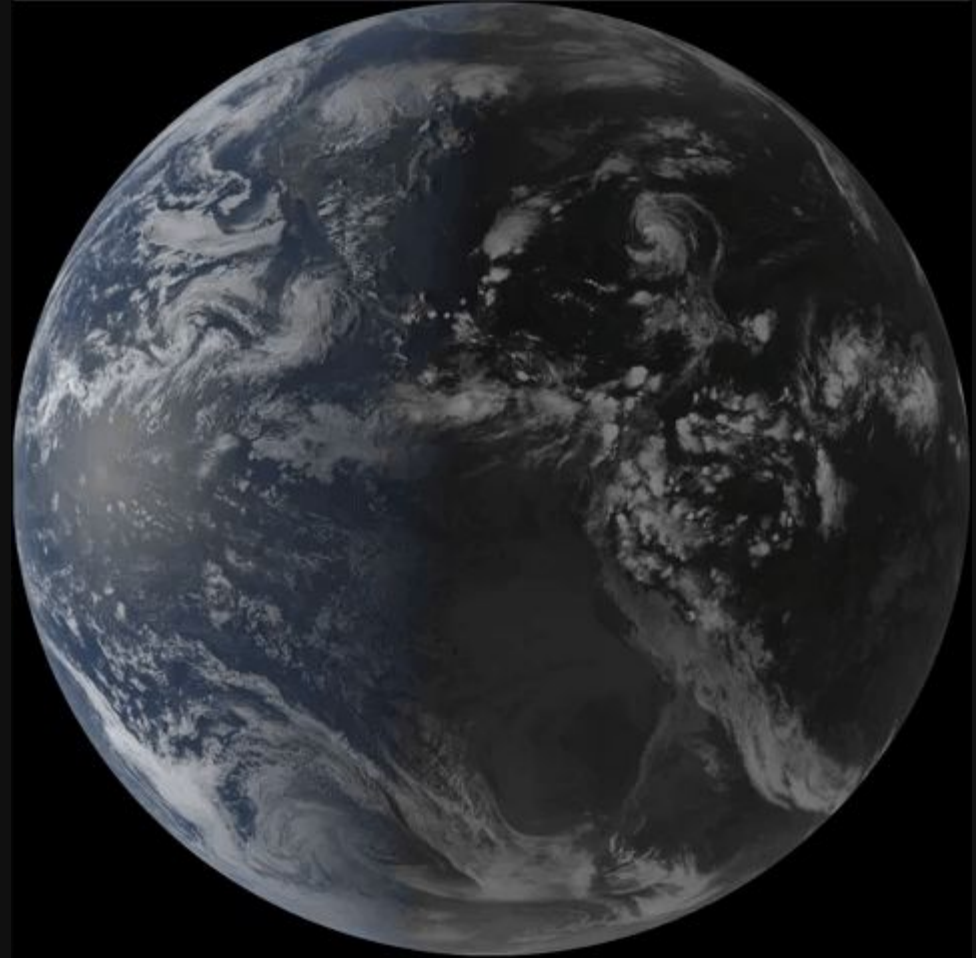
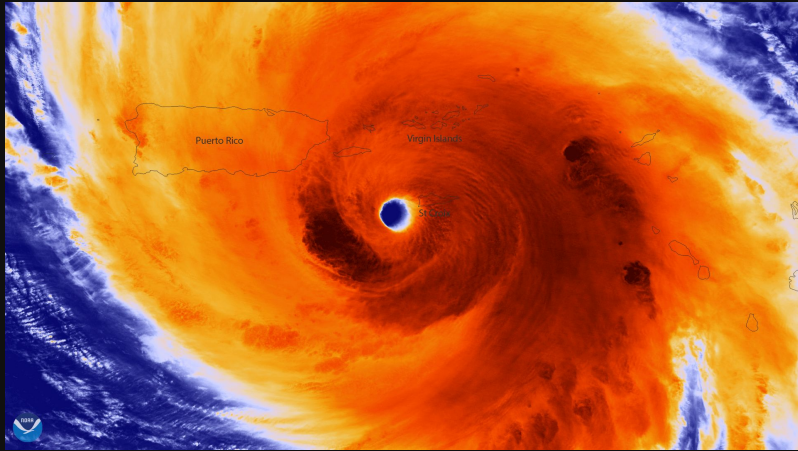


VIIRS - Puerto Rico - 24 July 2017

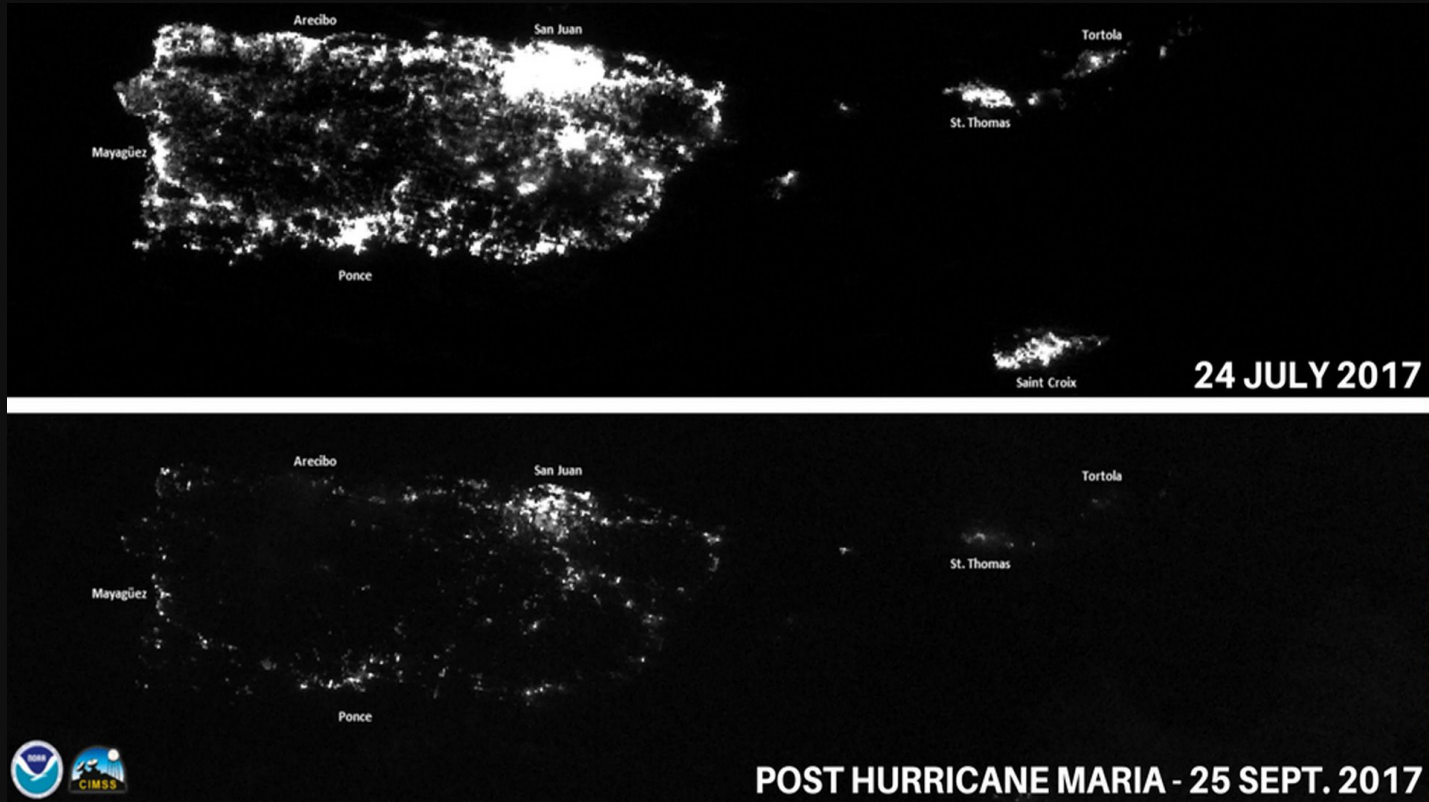


VIIRS - Puerto Rico - 25 September 2017





Electrification Impact of Hurricane Maria



Other Applications

- Agricultural Risk Management
- Human Rights Defense
- Flood Modeling
- Wildfire Response
- Deforestation Prevention
- Large-scale Emergency Evacuation

This Data is Free.

“NASA promotes the full and open sharing of all data with the research and applications communities, private industry, academia, and the general public.”

<https://earthdata.nasa.gov/earth-science-data-systems-program/policies>

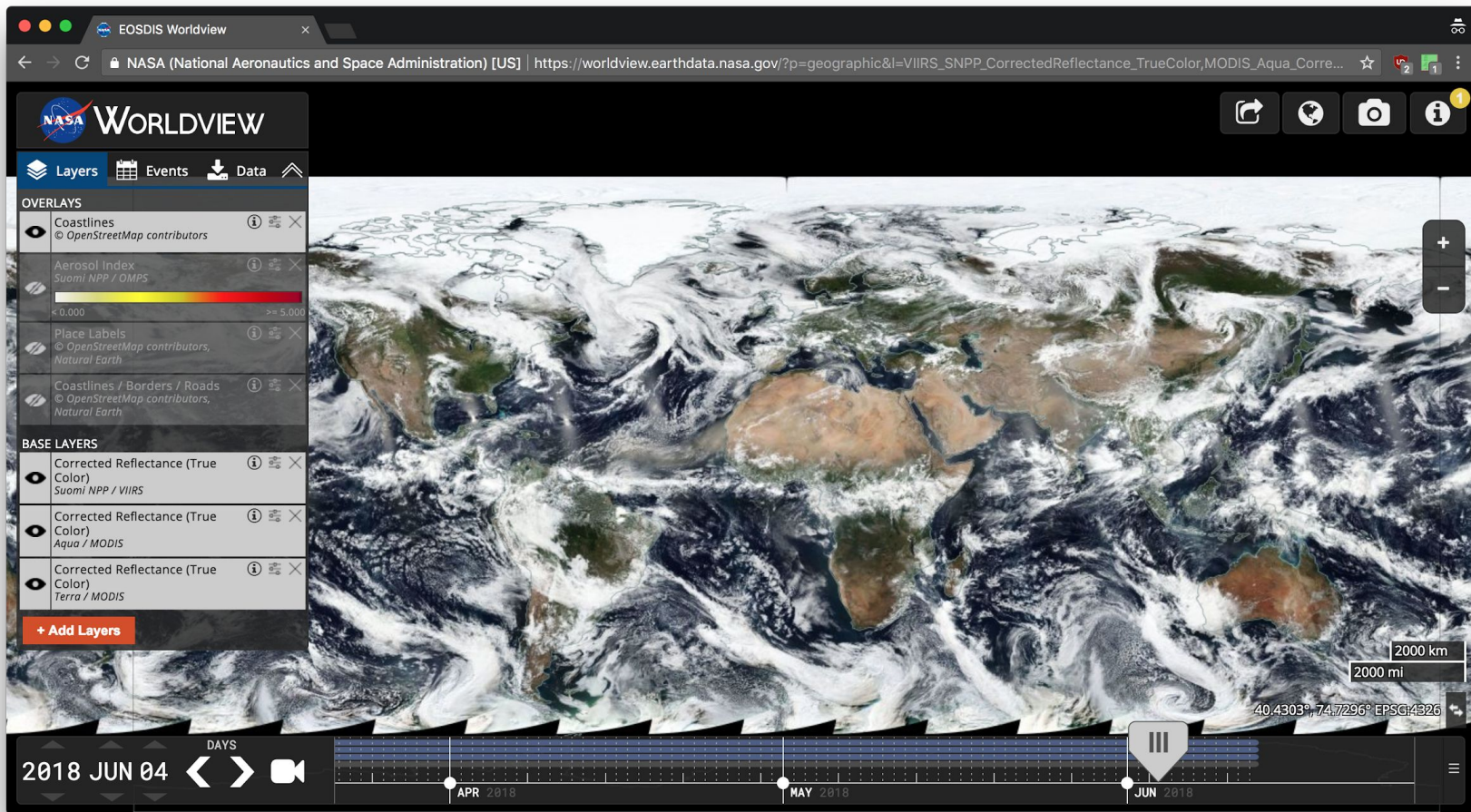


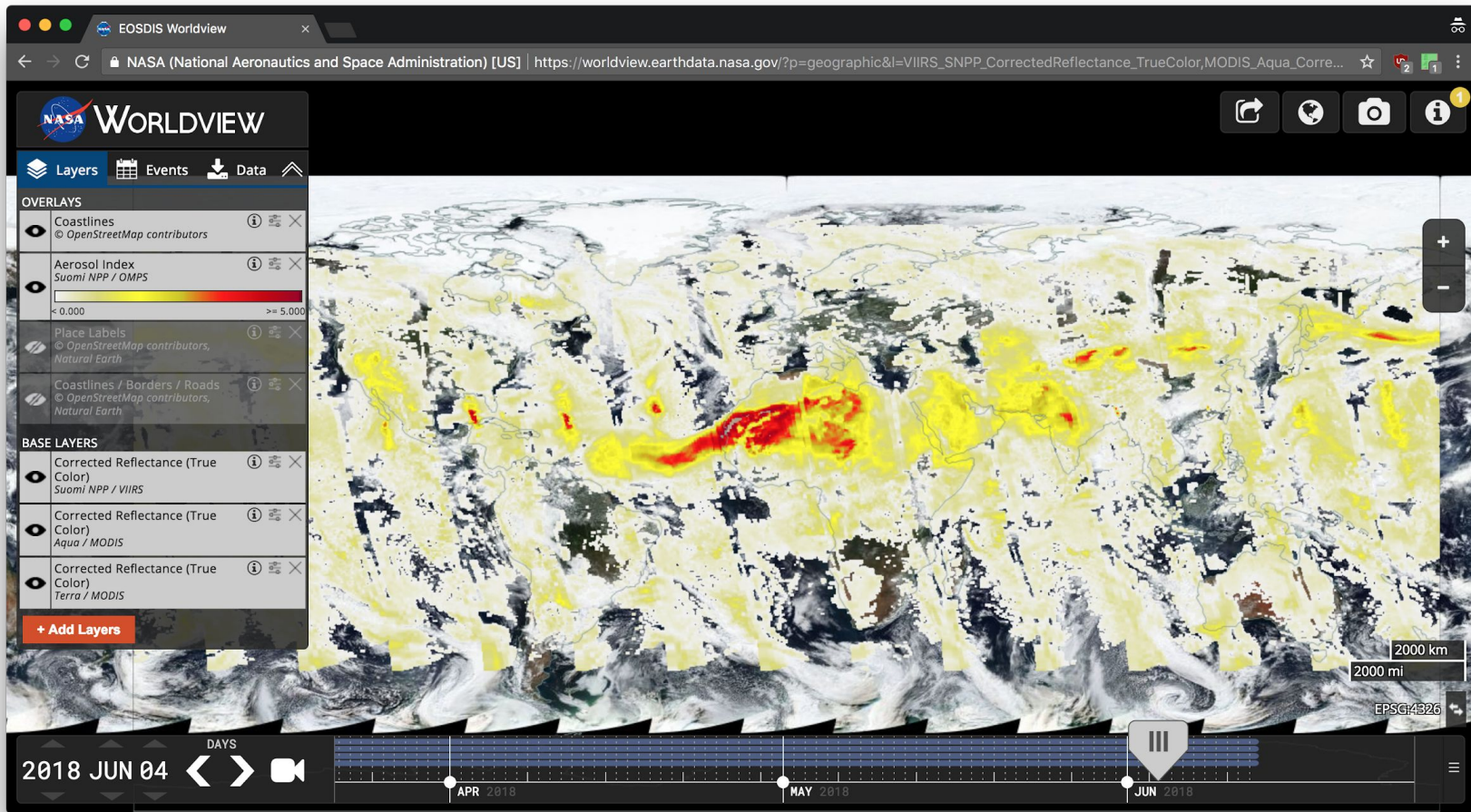
This Data is Free.

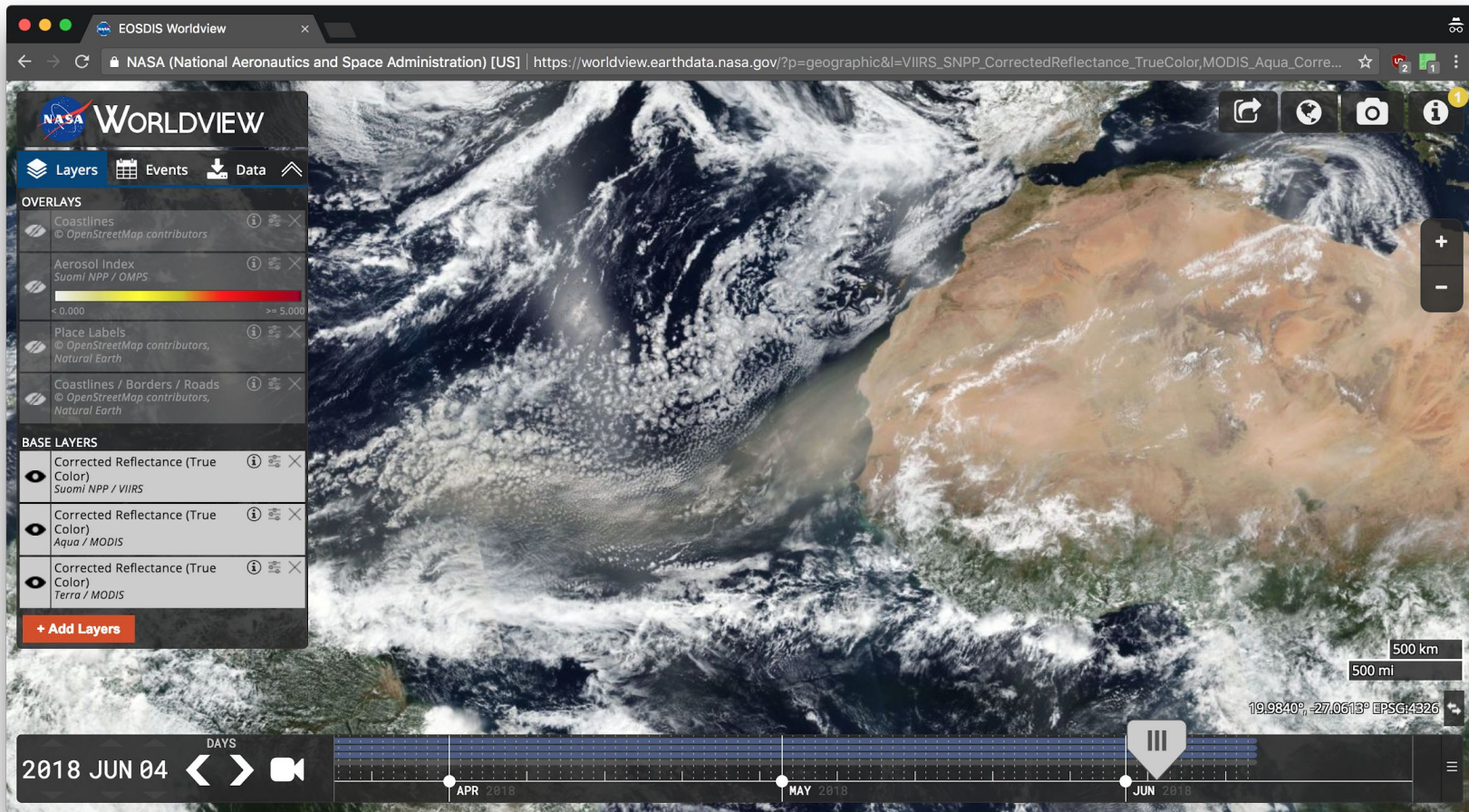
- There will be **no period of exclusive access** to NASA Earth science data
- NASA will enforce a principle of **non-discriminatory data access**
 - **All users will be treated equally**
- NASA will charge for distribution of data **no more than the cost of dissemination**

Exploring Earth Observation Data:

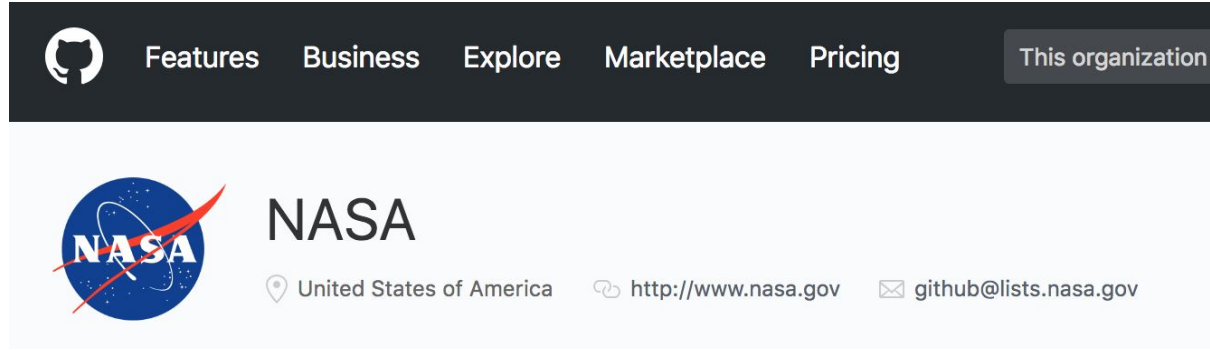
- Worldview
 - <https://worldview.earthdata.nasa.gov>
- Earthdata Search
 - <https://search.earthdata.nasa.gov>
- Common Metadata Repository (CMR)
 - <https://cmr.earthdata.nasa.gov>







(The software is free, too.)



<https://github.com/nasa-gibs/worldview>

<https://github.com/nasa/earthdata-search>

<https://github.com/nasa/Common-Metadata-Repository>

Imagery Credits

NASA EOSDIS

NASA Goddard Space Flight Center

NASA Earth Observatory/NOAA NGDC

NOAA National Environmental Satellite, Data, and Information Service (NESDIS)

Thank you!

andrew@element84.com

(We are hiring.)

