

# Acquisition and Analysis of MODIS Satellite Data



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# MODIS Flight Instrument

- Integrated instrument aboard NASA's Terra and Aqua satellites.
- Utilized for:
  - Developing Earth system models.
  - Analyzing global dynamics and processes.

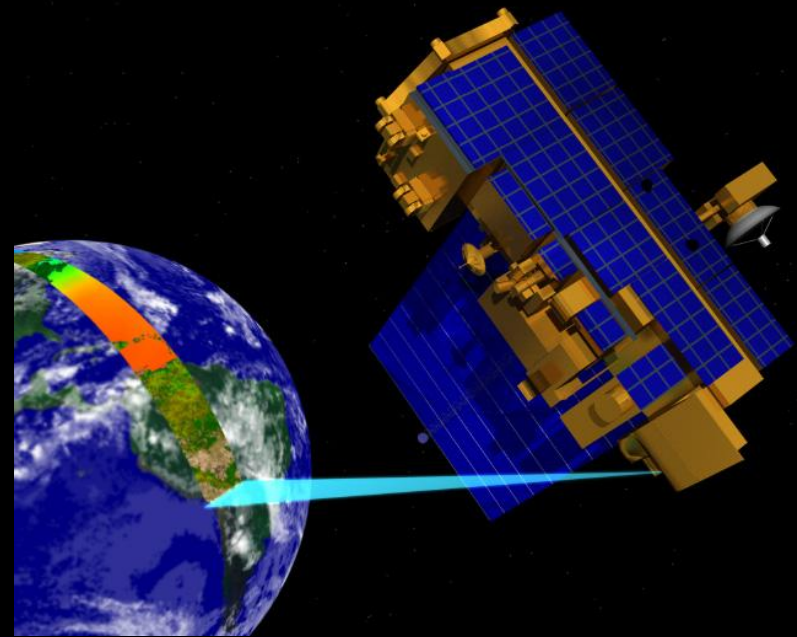


Figure 1 [1]

# MODIS Specifications

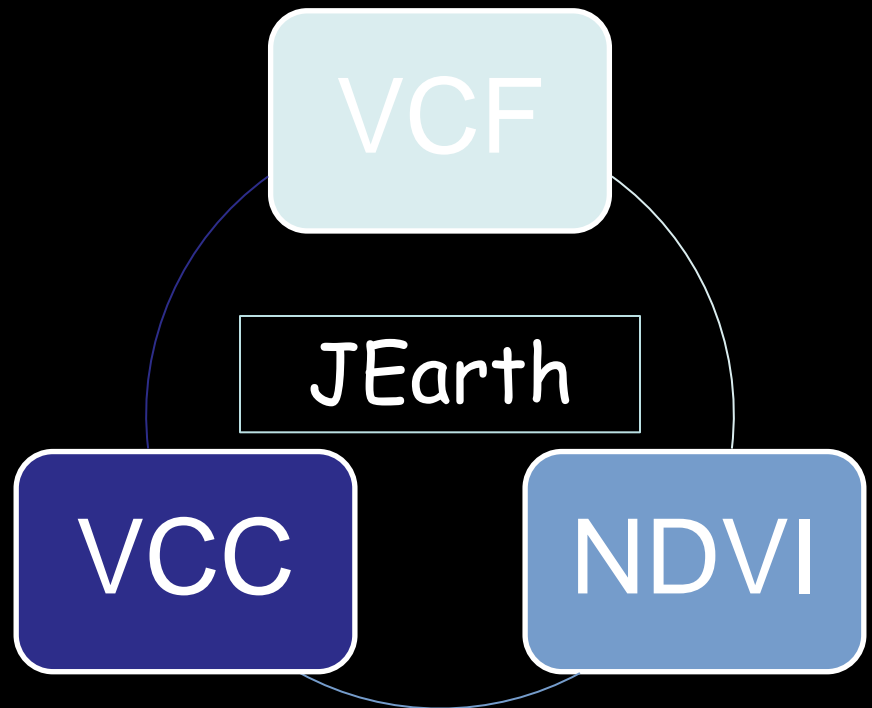
- Terra:
  - Surface reflectance
  - Albedo
  - Surface temperature
  - Vegetation indices
- Aqua:
  - Soil moisture
  - Land ice content
  - Phytoplankton/organic matter in ocean



Figure 2 :  
Terra MODIS image of Atlantic Coast [2]

# Why MODIS?

- Excellent source for a wide range of datasets.
- Datasets can be easily integrated into GIS tools.



# JEarth Fundamentals

- Adaptation of JMars—a Java-based open source GIS tool for analyzing Mars datasets.
- Key Characteristics:
  - Simultaneously display multiple datasets.
  - Earth-based satellite/airborne imagery
  - Vector-based shapefiles (i.e. geology, ecology, social and political datasets)

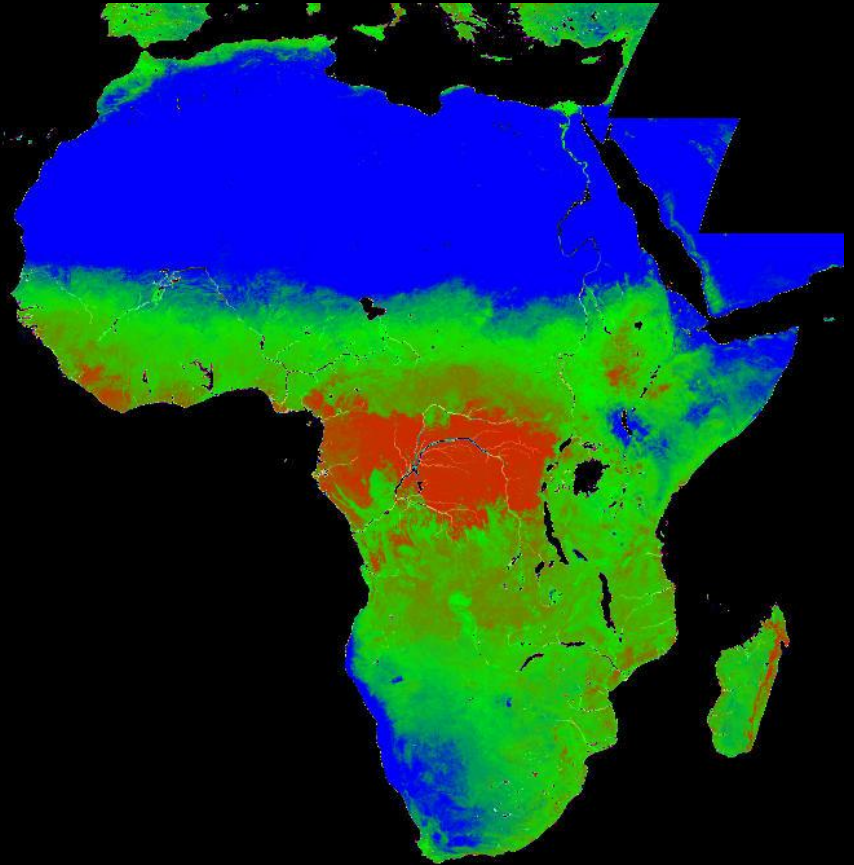
# Vegetation Continuous Field Products

- VCF Product Layers
  - Percent Tree Cover
  - Percent Herbaceous Ground Cover
  - Percent Bare Ground Cover
- Generated from monthly 500 meter resolution MODIS data.



# Vegetation Continuous Field Products (cont.)

- RGB Band Combination
  - R: Tree
  - G: Herbaceous
  - B: Bare



# Summary and Future Work

- VCF data products for all 7 continents were successfully deployed into JEarth.
- Integrate and obtain other datasets:
  - NDVI
  - VCC
  - Social
  - Population and political related
- 100 Cities Project



# Acknowledgements

- Lela Prashad
- Dale Moss
- Scott Dickensheid
- JEarth Team
- ASU/NASA Space Grant Program

# References

- [1] Numerical Terradynamic Simulation Group at the University of Montana: <http://www.ntsg.umt.edu/>
- [2] NASA Goddard Space Flight Center: MODIS Web, <http://modis.gsfc.nasa.gov/>
- [3] Mars Space Flight Facility at Arizona State University, <http://jmars.asu.edu/>

Questions?