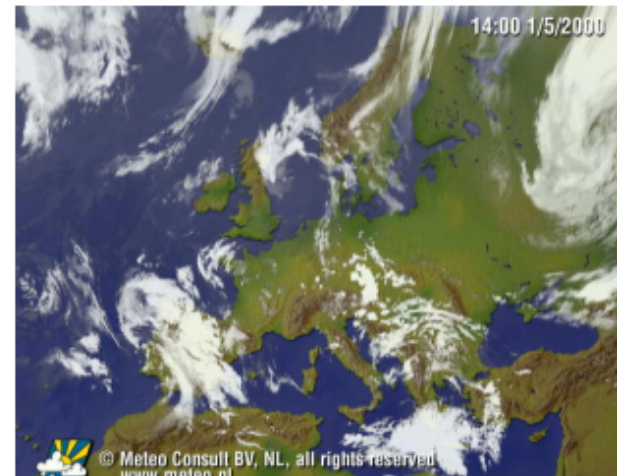
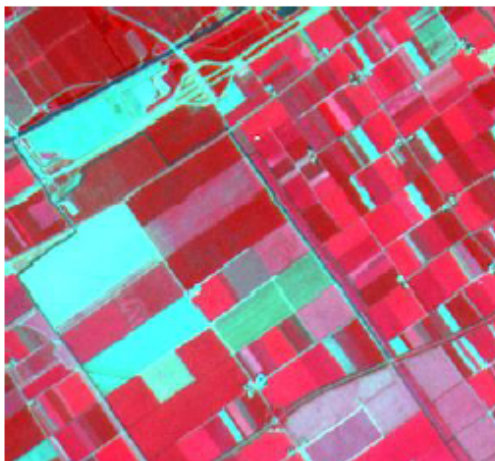


History of Remote Sensing

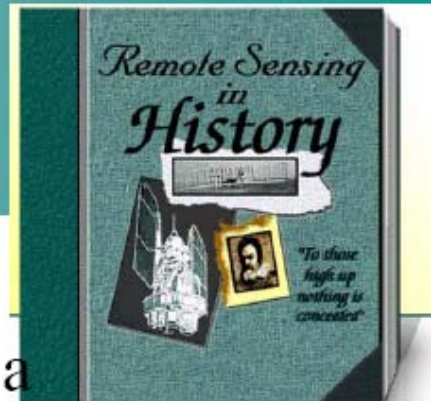
Definition

Remote Sensing is the science or the technique of deriving information about objects at the Earth surface from images using (parts of) the electromagnetic spectrum

- Measuring electromagnetic energy (light), reflected or emitted
- Non-destructive method, no physical contact
- Surveying the spatial distribution of objects
- Determining properties of objects
- Monitoring the dynamics of features

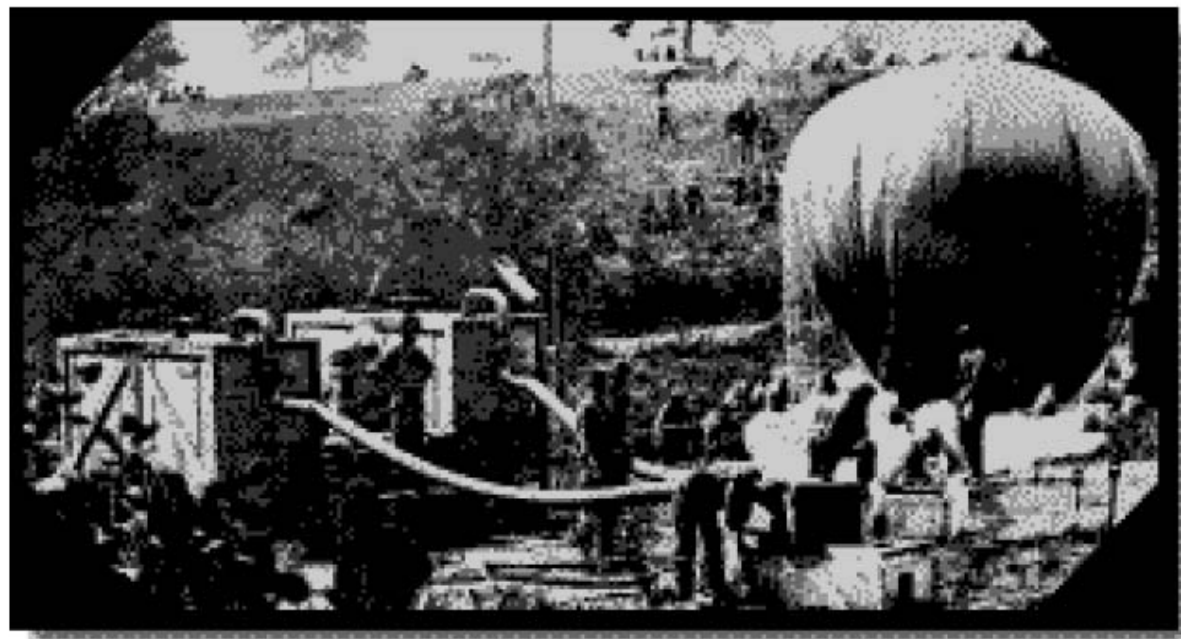


RS history



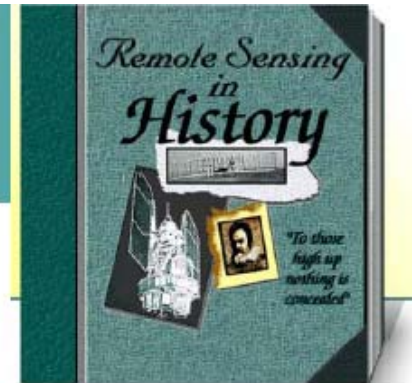
Gaspar felix tournachon alias Nadar takes first picture from a Balloon (1859)

First weather observation from a balloon (1862)

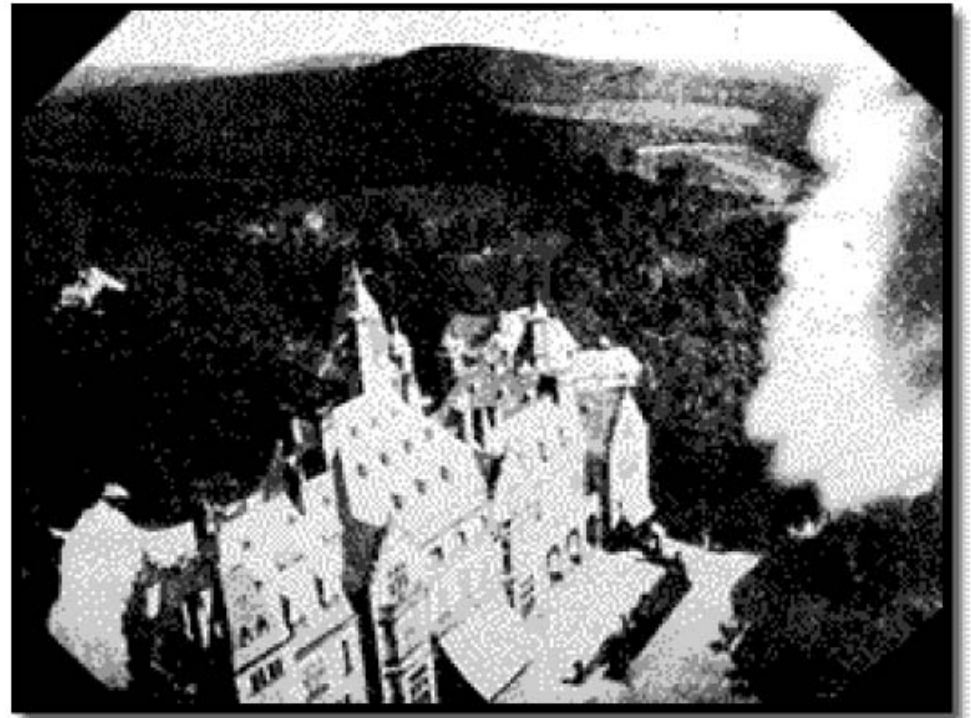


1860

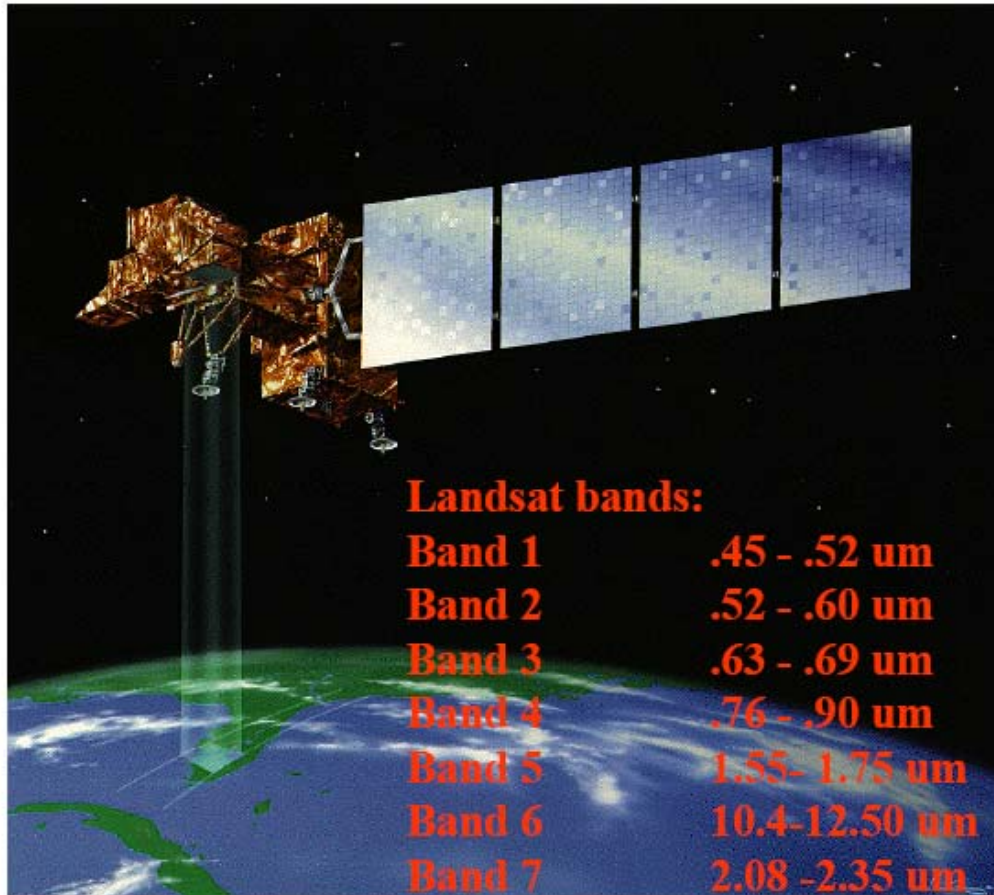
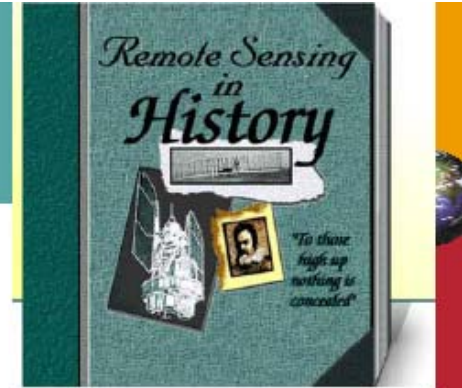
RS history



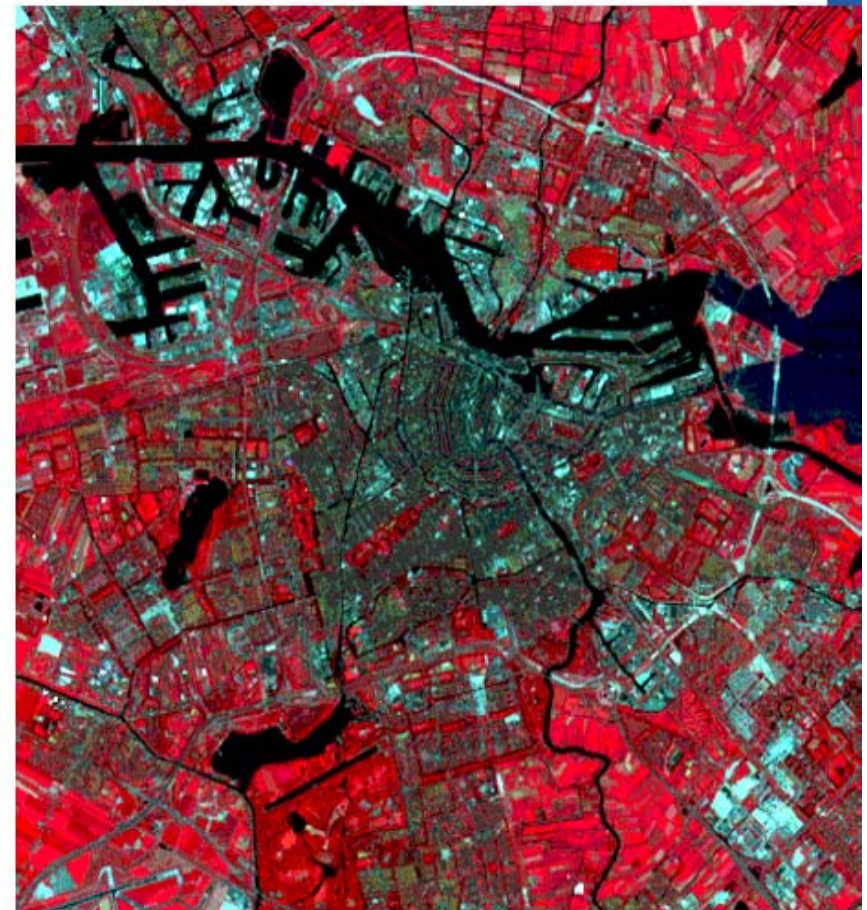
Bavarian pigeon corps
takes pictures behind
enemy lines in 1903



RS history



Hunts work led to the re-definition
Of the landsat TM bands namely to
The inclusion of a band in the swir
Note the strange numbering!



Milestones in the History of Remote Sensing

- 1800 Discovery of Infrared by Sir W. Herschel
- 1839 Beginning of Practice of Photography
- 1847 Infrared Spectrum Shown by J.B.L. Foucault
- 1850 Aerial photography from balloons
- 1873 Theory of Electromagnetic Spectrum by J.C. Maxwell

- 1909 Photography from Airplanes

- 1916 World War I: Aerial Reconnaissance

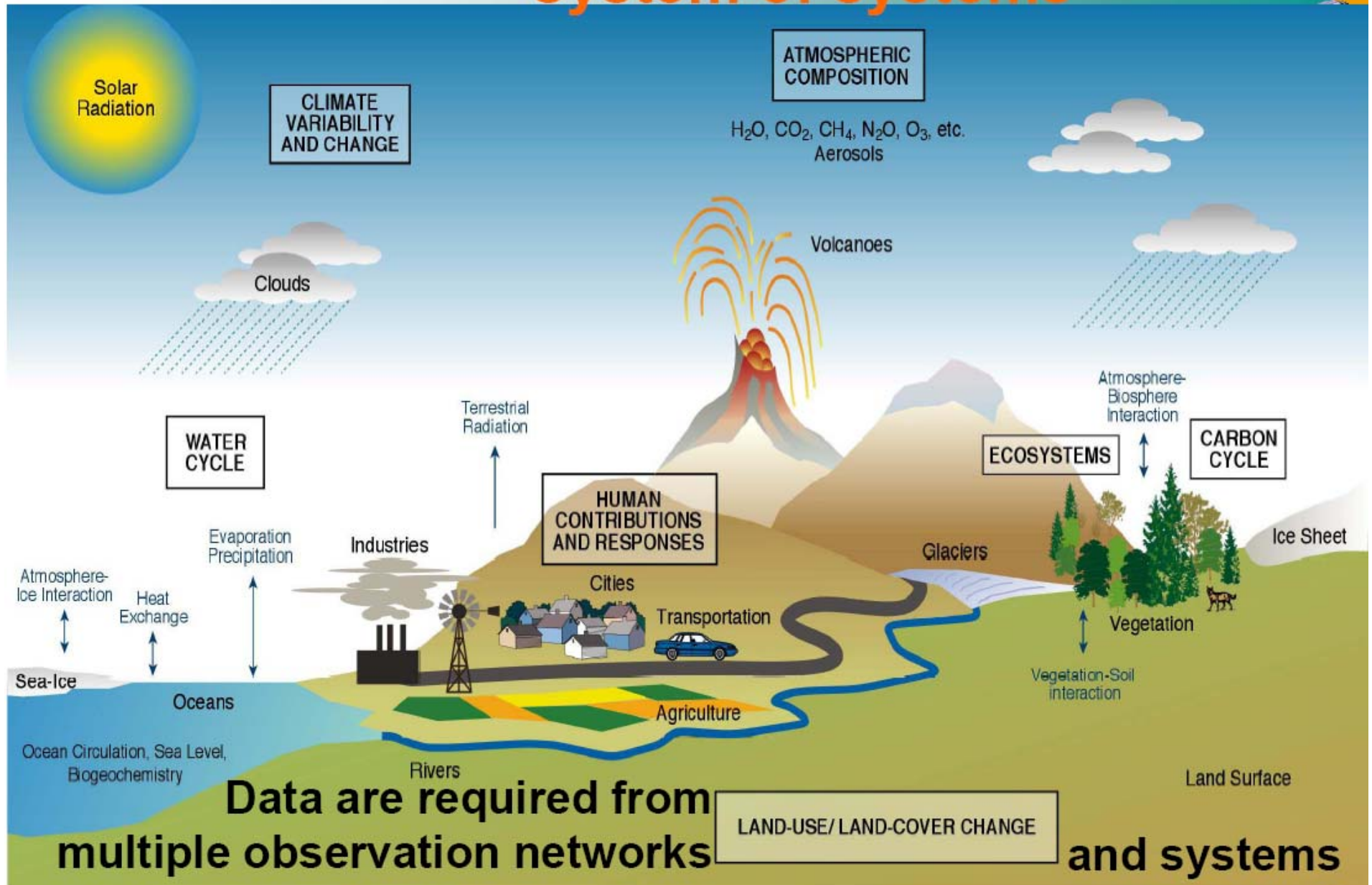
- 1935 Development of Radar in Germany
- 1940 WW II: Applications of Non-Visible Part of EMS
- 1950- Military Research and Development

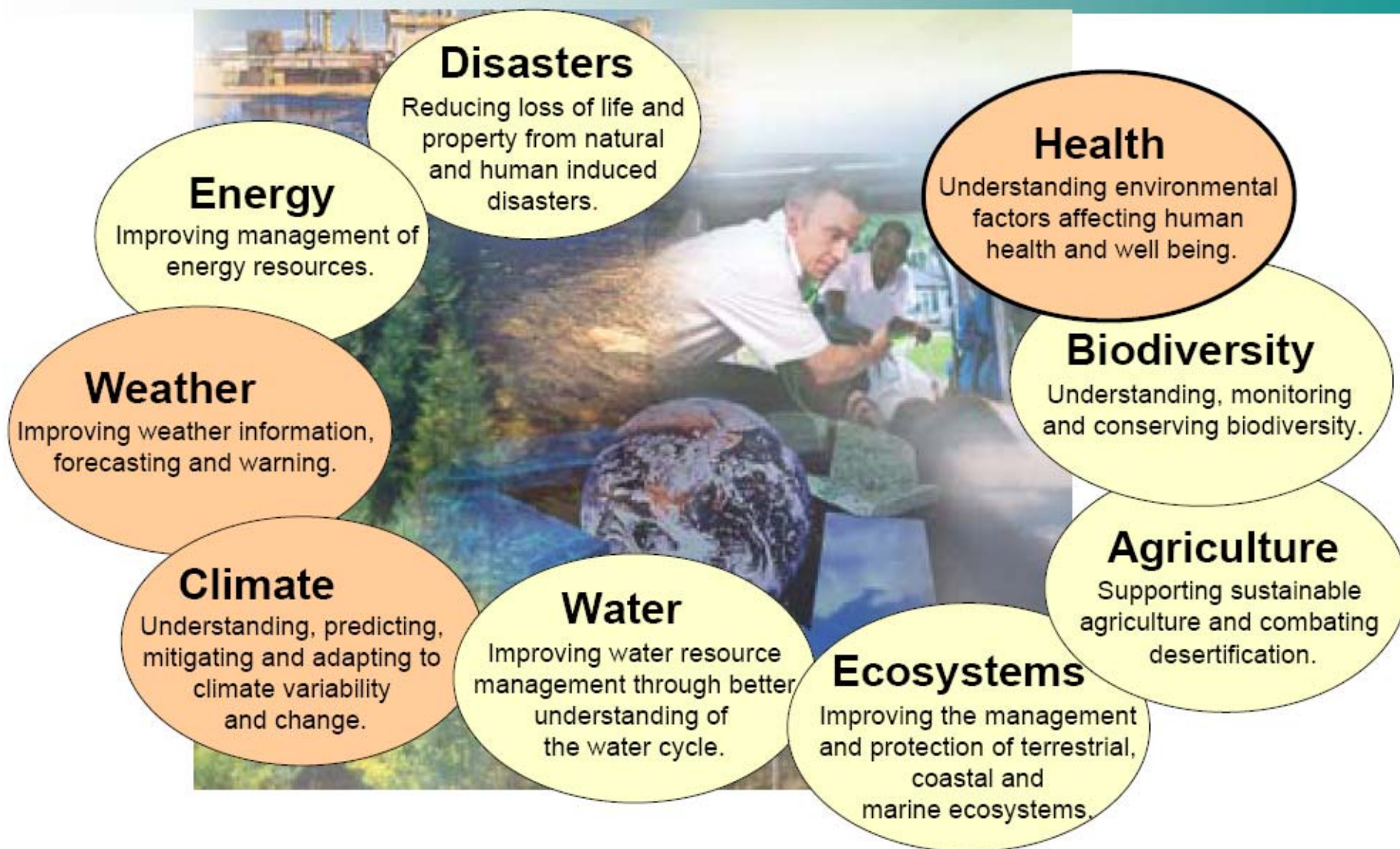
- 1960 First TIROS Meteorological Satellite Launched
- 1970 Skylab Remote Sensing Observations from Space
- 1972 Landsat 1: First Earth Observation Platform
- 1970-'80 Rapid Advances in Digital Image Processing

Milestones in the History of Remote Sensing

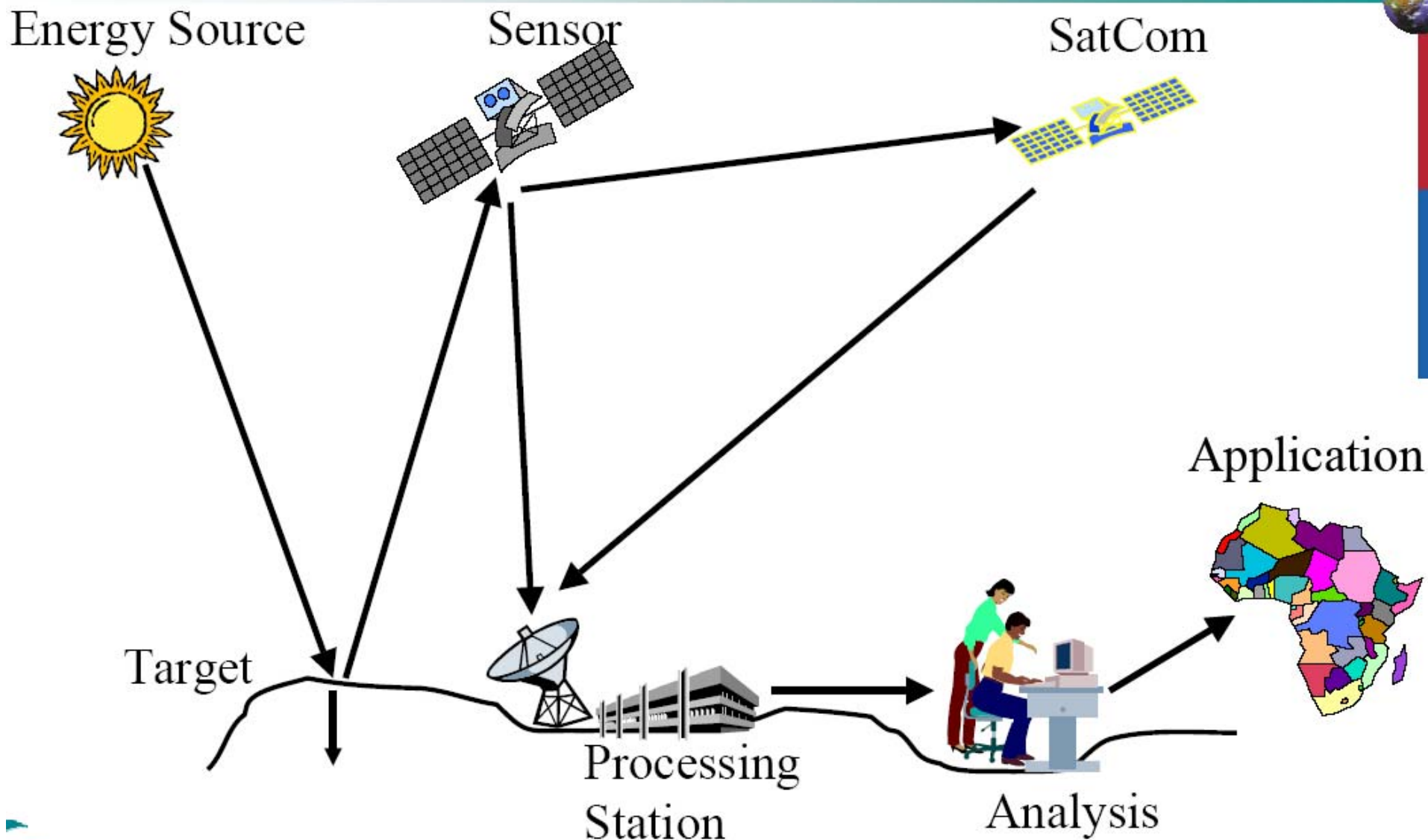
- 1980s Landsat-4: New Generation of Landsat Sensors
- 1986 French Commercial Earth Observation Satellite SPOT
- 1980s Development Hyperspectral Sensors
- 1990s Development High Resolution Spaceborne Systems
- First Commercial Developments in Remote Sensing
- 1998s Towards Cheap One-Goal Satellite Missions
- International Space Station
- 1999 Launch of TERRA platform with ASTER
- 2000 Launch of IKONOS (1 by 1 m)
- 2001 Launch of EarlyBird (0.6 by 0.6 m)
- 2002 Launch of ESA Envisat

The Earth is a complex system of systems





Remote Sensing



Why all the trouble of including other wavelengths ?



Non-visible wavelengths reveal other types of information



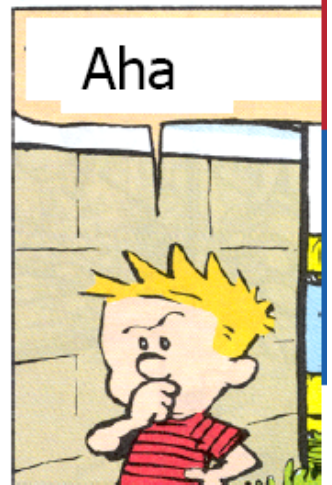
Using Earth Observation, we seek answers to Environmental Questions:

Vegetation & agricultural crop studies:
vegetation cover, vegetation properties:
cover, LAI, biomass, dynamics

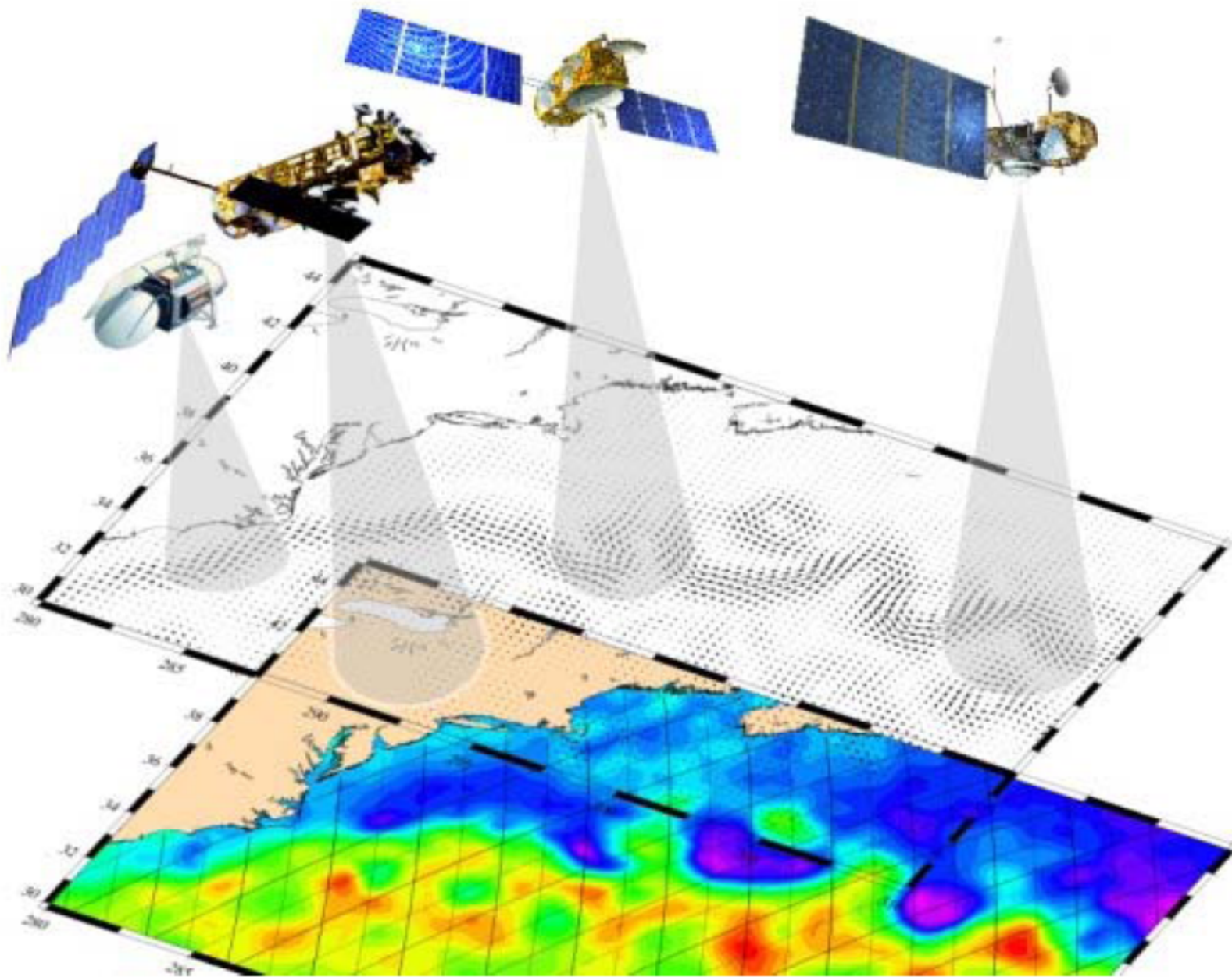
Forestry:
tree species, properties,
logging activities, re-growth

Soils & geology:
Spatial distribution of soils, organic matter content,
moisture content, minerals, rocks, faults
hydro-carbon seepages

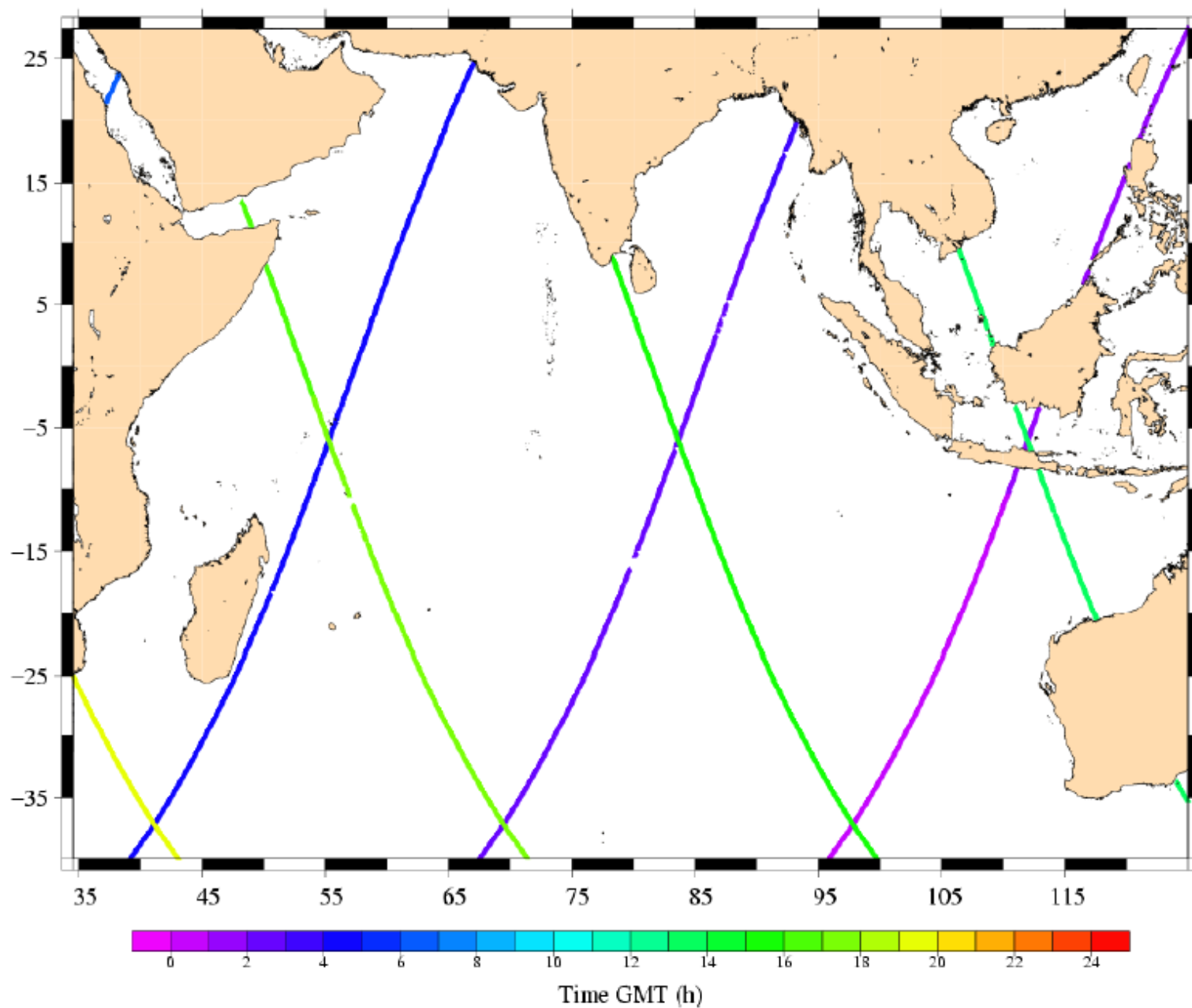
Socio-economic studies:
Distribution of people, growth of a city,
movement of people,



SATELLITE ALTIMETRY



Tsunami (26/12/2004)
Jason-1 IGDR

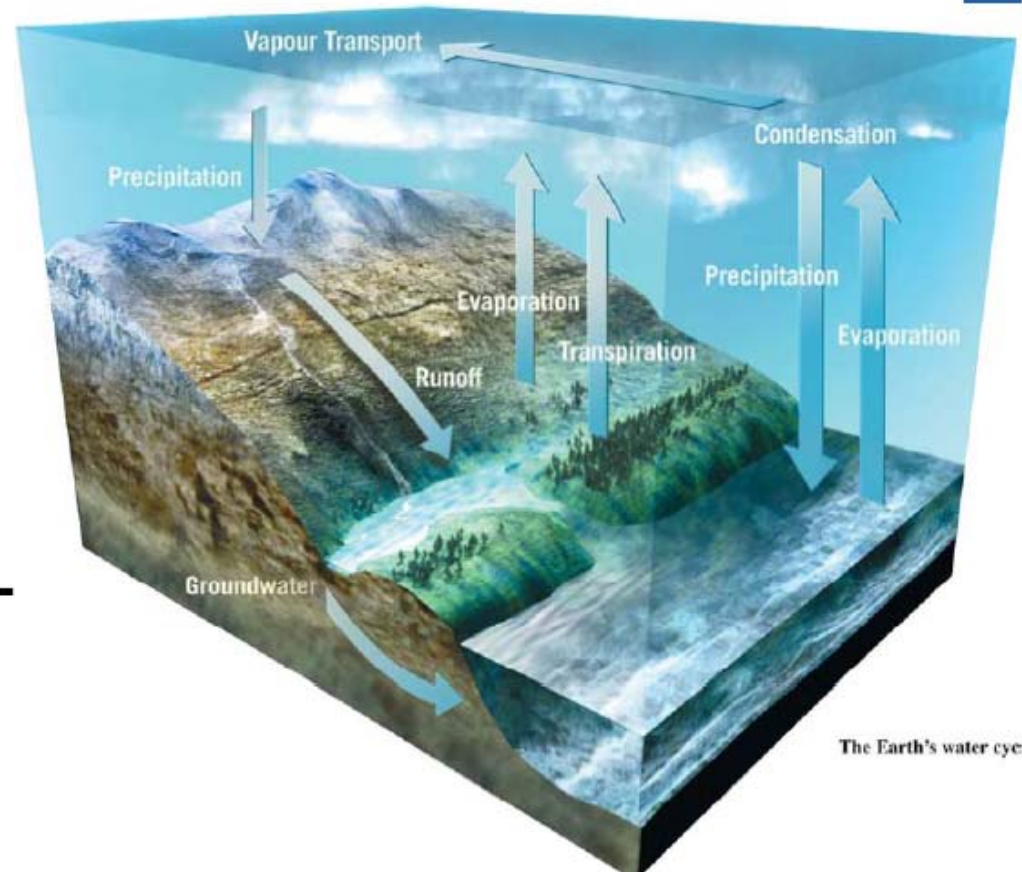


Global Continental Water-Level Observations

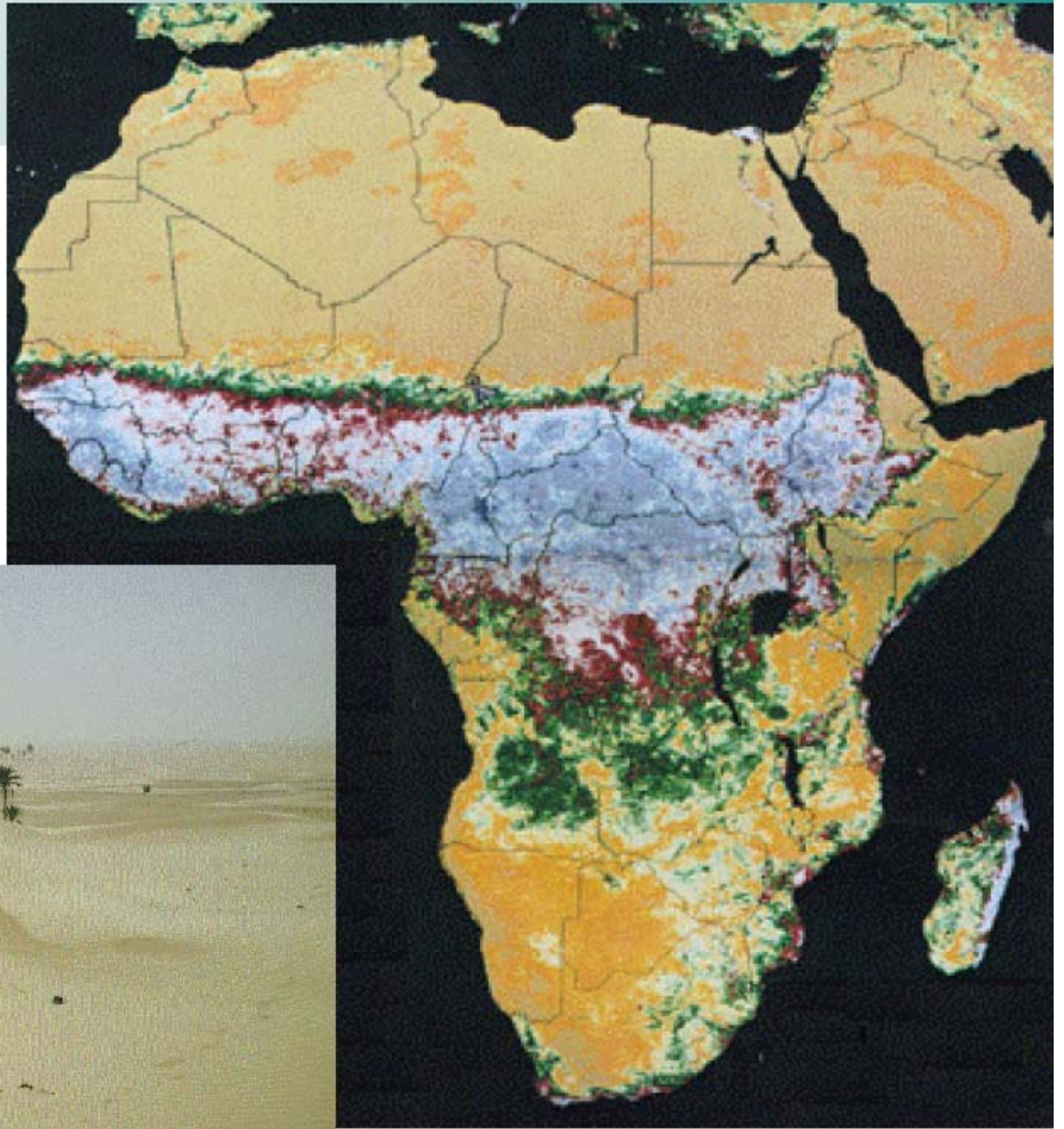


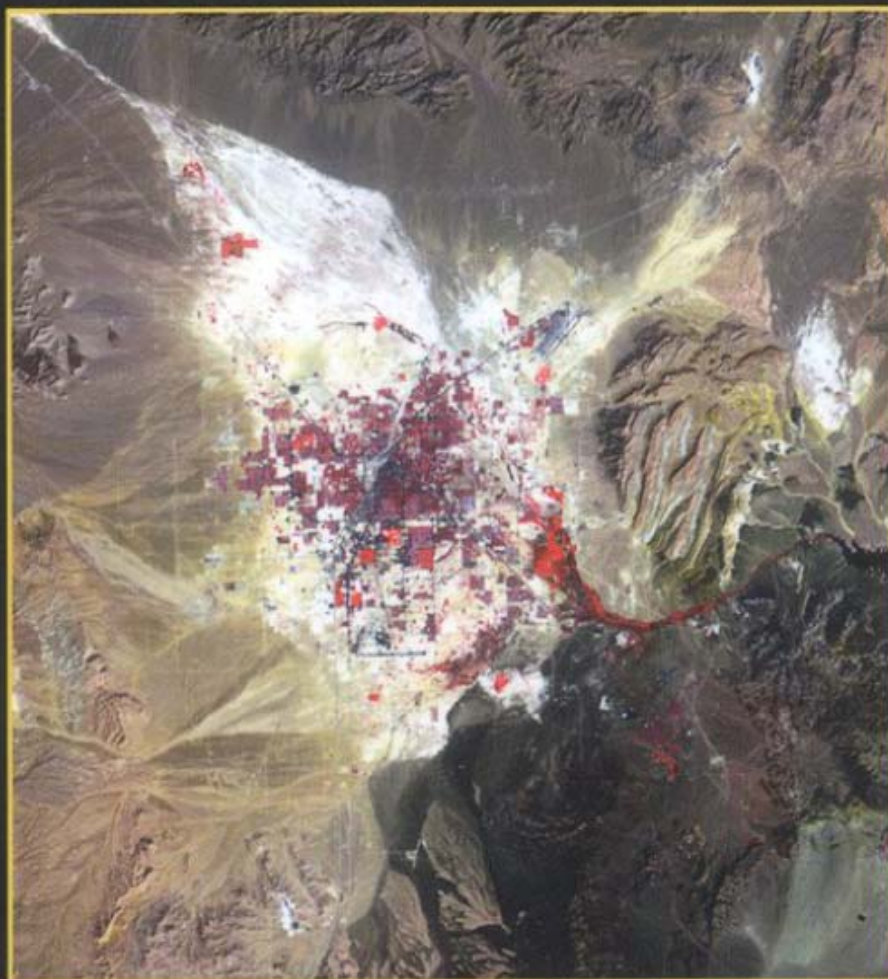
Strengthening satellite and in situ monitoring networks of estuaries, rivers, lakes, reservoirs, and groundwater levels:

- For flood risk management
- For improving water resource management
- For understanding sea-level rise



Is the Sahara
Spreading out ?





Landsat MSS 13 August 1972



Landsat TM 7 August 2000

Urban Expansion