Remote Sensing 1: GEOG 4/585

- Some nice picture
- Details about time and date of class, instructor, + contact information, office hours

Remote Sensing 1: GEOG 4/585

- Course overview
- Description
- Logistics and Operation
  - Lectures
  - Labs
  - Unscheduled times
  - Active learning
  - Assignments, grading, and workload
- Course materials
- Course policies
  - Workload and grading
  - Participation
- Technical requirements
- Expectations (community and mental health)

Why care about remote sensing?

From stories in the news?

From personal interest or experience?

Someone told you to take it?

Why does the GE care?

Why does the instructor care?

What is remote sensing?

- Remote sensing is the science of obtaining properties of an object or phenomenon without making physical contact with it

- Broadly there are two types of remote sensing:

    - “Passive” when the energy emitted by an object is detected by the sensor

    - “Active” when the sensor provides its own source of energy to illuminate an object and measures its reflected properties

- And while we most of this class will focus on electromagnetic energy (visible, thermal, microwave), we can also use acoustic (sonar, ultrasound) and gravitational energy.

What is remote sensing?

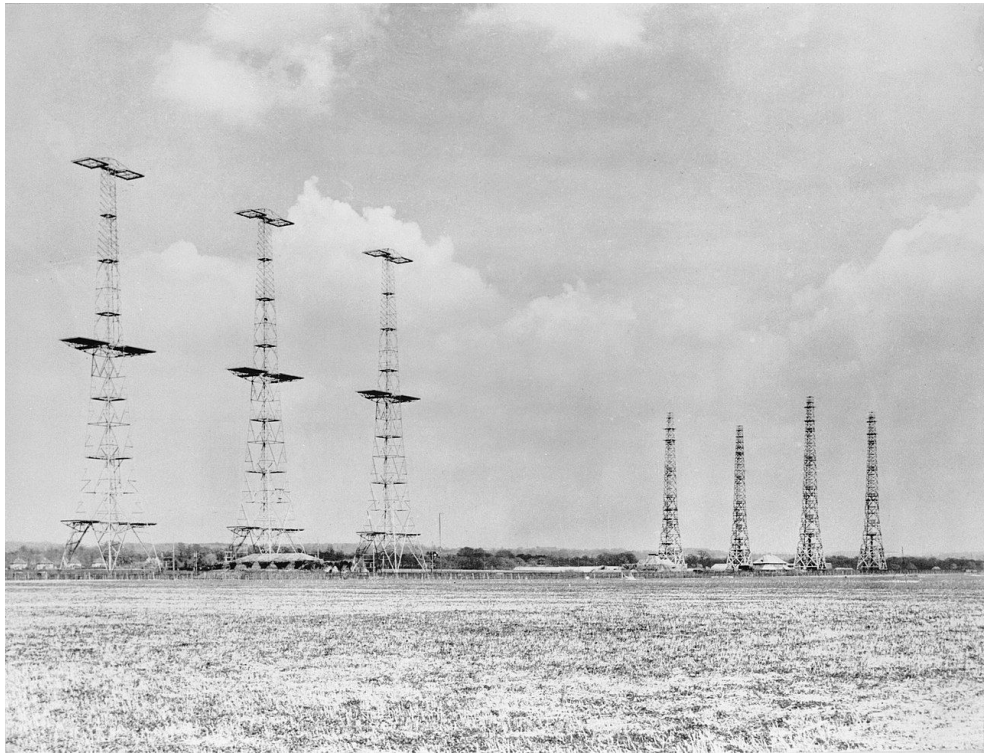
Passive remote sensing

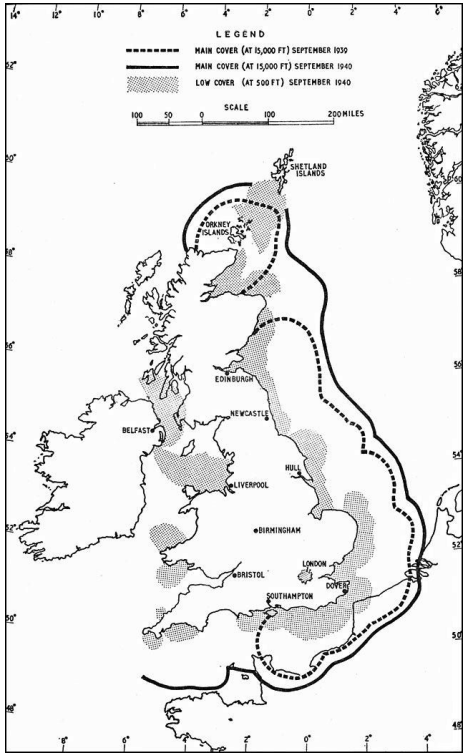
Active remote sensing

Active or passive remote sensing?

Laser infrared thermometer

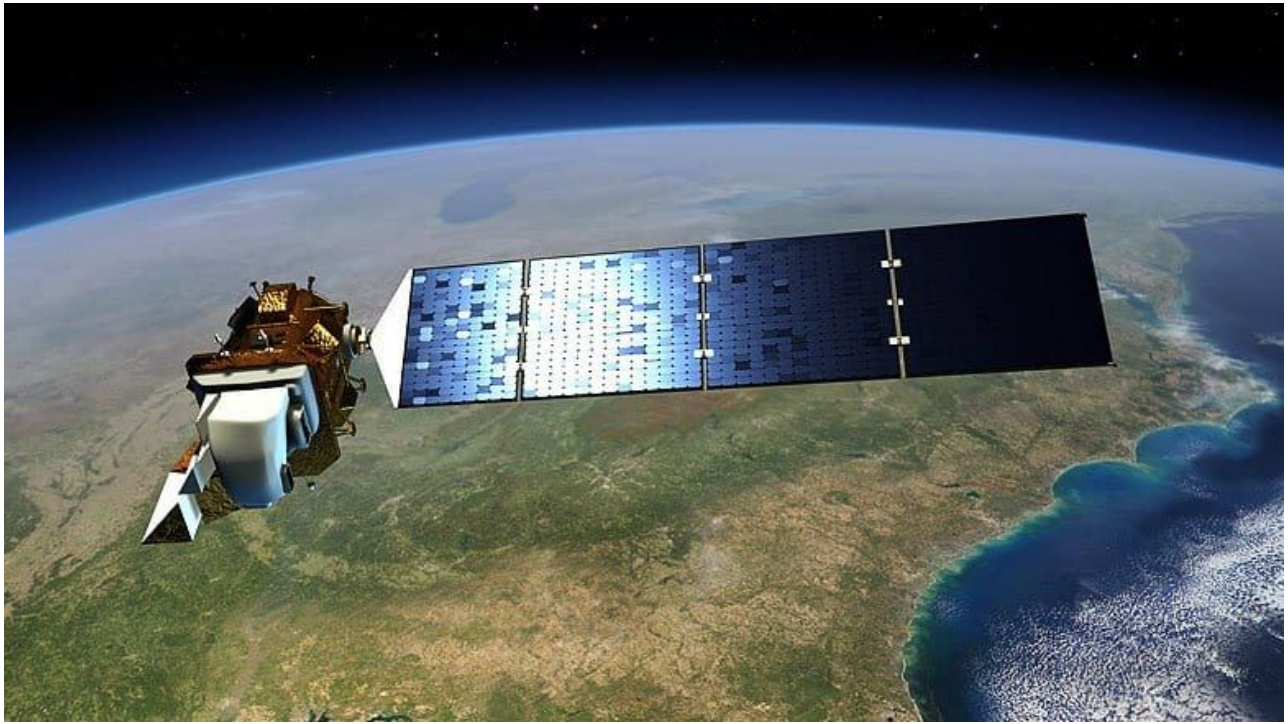
Active or passive remote sensing?





Chain Home radar installation, Sussex (1945)

Active or passive remote sensing?



NASA's Landsat 8

Answers

- Laser infrared thermometer
- Chain Home radar installation
- NASA’s Landsat 8

Remote sensing platforms

UAVs and Drones

ADVANTAGES
-Very high resolution imagery
-Programmable flight paths
-LiDAR capabilities

DISADVANTAGES
-Very small coverage extent
-Visual line of sight

Airplanes and Helicopters

ADVANTAGES
-High resolution imagery
-Pilot-flown flight paths
-LiDAR capabilities

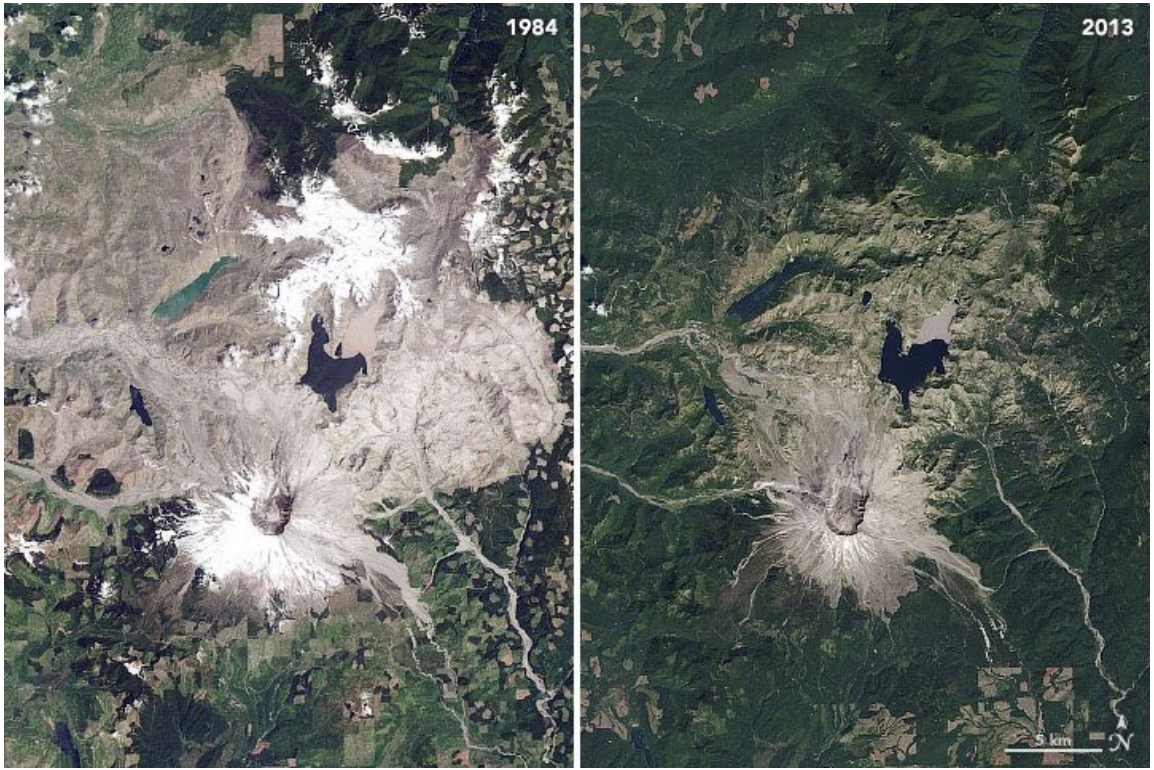
DISADVANTAGES
-Small coverage extent
-Flight operation

Low Earth Orbit Satellites

ADVANTAGES
-High to coarse resolution imagery
-Large coverage extent

DISADVANTAGES
-Coverage limited to orbital path
-Cloud obstructions

Remote sensing data



Mount St. Helens in 1984 and 2013

What happens in this class?

- Prep - background reading to become familiar with concepts and prepare questions
- Lectures - opportunity to ask questions about the course materials, work on remote sensing problems and concepts with your peers
- Discussions and quizzes?
- Labs - applied work using a variety of datasets and software
- Assignments (independent and group)

Prep

- Background reading
  - Which textbook?

- Canvas link

Lectures

- Overview of syllabus
- Canvas link

Discussions and quizzes (X%)

- Expectations

Labs (50%)

- UO Virtual Lab*
  - QGIS, general-purpose GIS software
  - Python, commonly used programming language
  - SNAP, remote sensing software provided by the European Space Agency

- Online Remote Sensing Services
  - Earth Explorer
  - Google Earth Engine

- Download onto your own computer

*note on technology access issues - please let one of the instructors know if you are having any problems at all in time, technology, or space access to the needed materials and computing resources for the class!

Assignments (X%)

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Expectations

- From me
- From your peers
- From yourselves

Today’s lab

- Introduction to QGIS, Python