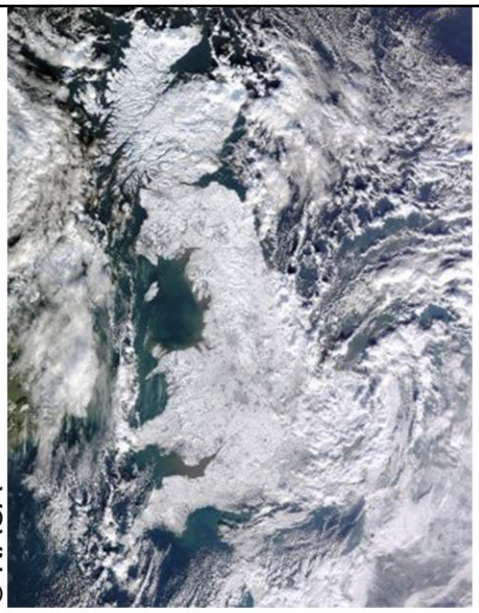

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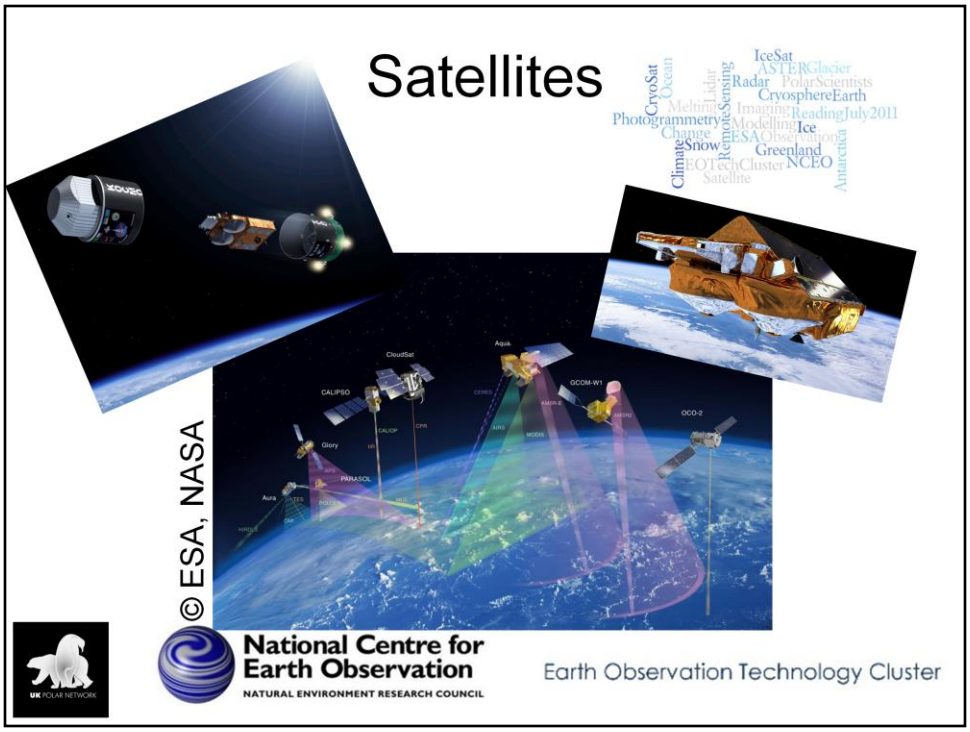
Remote Sensing for Polar Scientists

UK POLAR NETWORK

National Centre for Earth Observation
NATURAL ENVIRONMENT RESEARCH COUNCIL

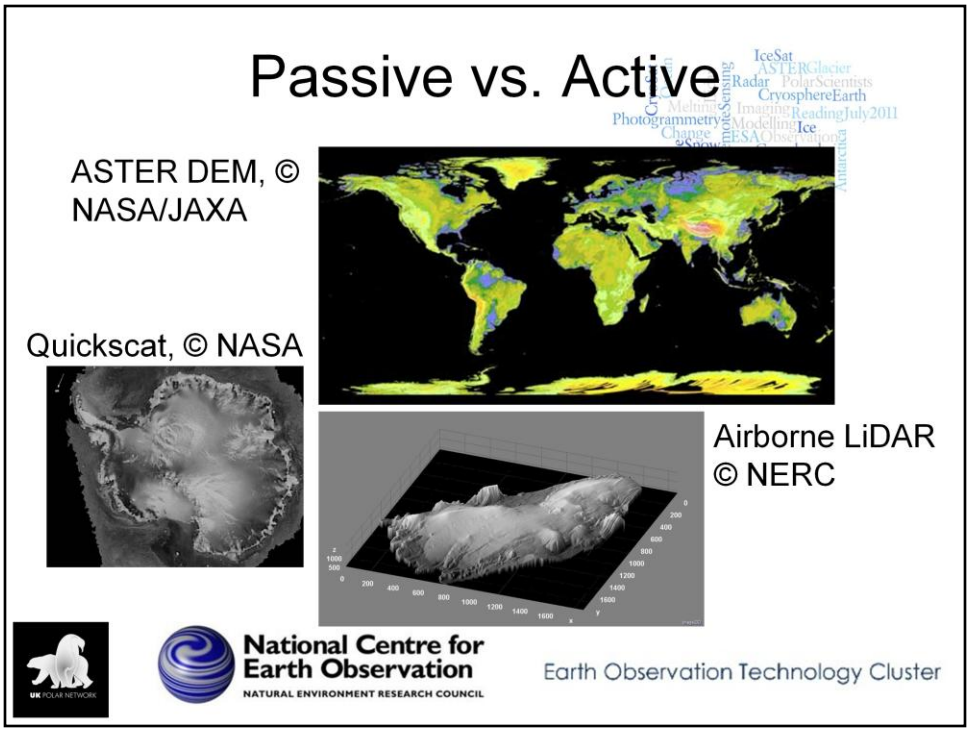
Earth Observation Technology Cluster

Remote sensing is a lot more than you think it is. Some everyday examples are: Digital photography, Google earth (spy Photography), weather/cloud maps, average speed cameras, radar guns, looking at other planets. You can ask your audience (before you tell them all this) if they might be able to think of some examples. Or if they have any others to add!

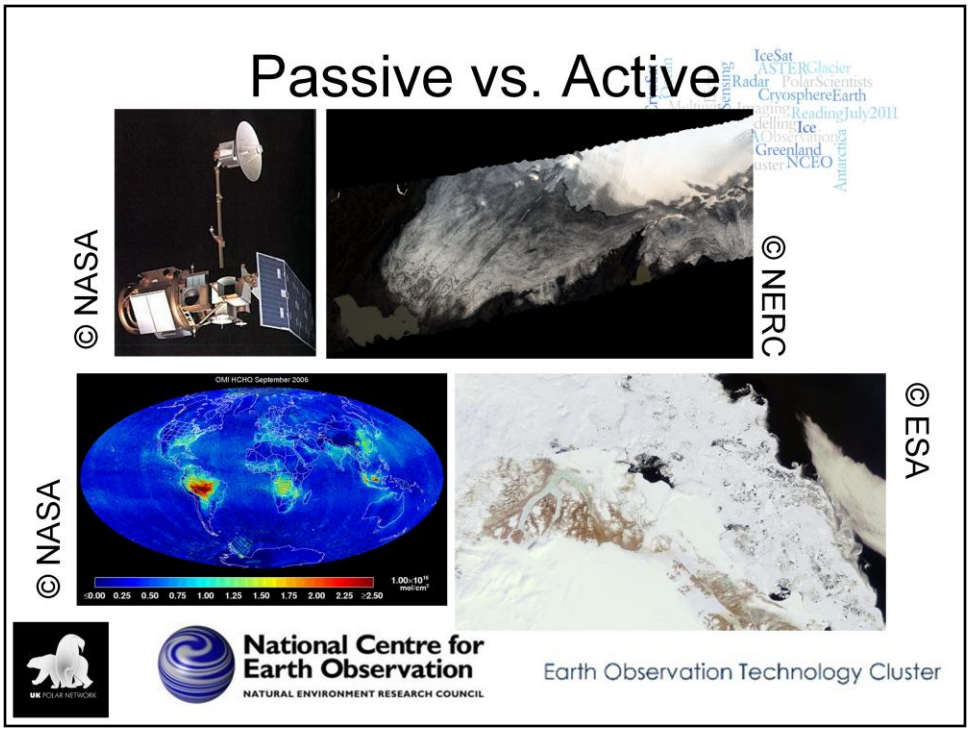


One of the main types of remote sensing is satellite-based. You can highlight different platforms. (top left and right are versions of Cryosat and middle image is NASA's "A-Train" group of satellites which all follow each others orbits.) Do you have a satellite you work with that you might want to mention in particular?

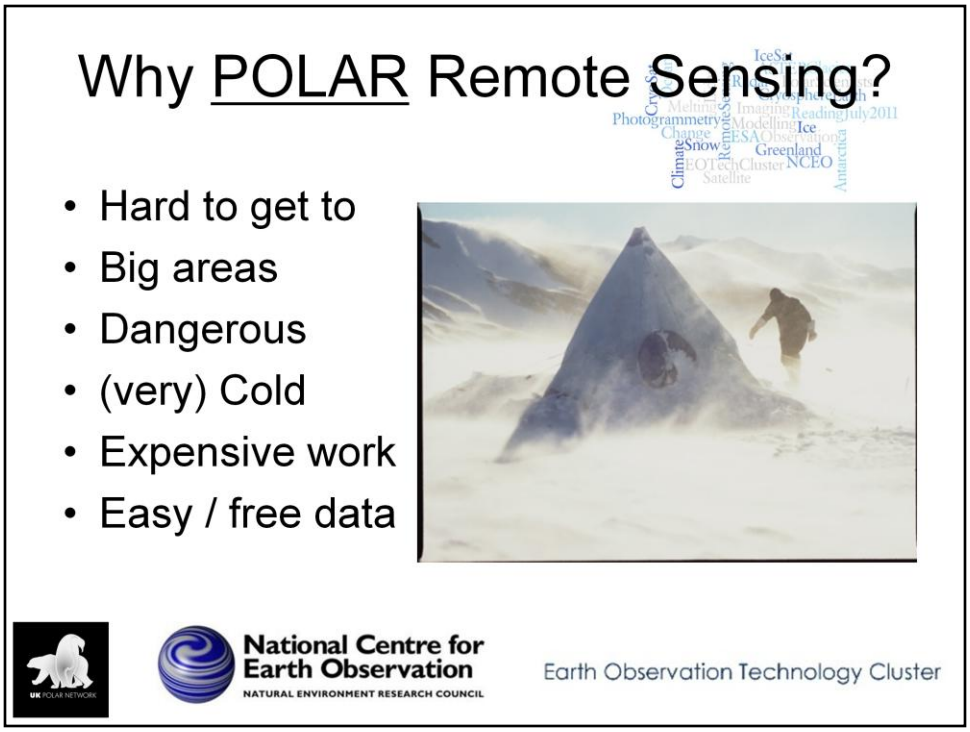
In addition to satellites, there are also other platforms. Like unmanned drones, planes, helicopters. Top left is “sensefly” an airborne multispectral sensor. Top right is a BAS twin otter aircraft used for airborne geophysics. Bottom left is a MicroDrone used for mounting small sensors (e.g. crowd surveillance). Bottom right is a long-ranged unmanned drone (NASA’s Global Hawk, also used by the US military on the name of “predator drone”) which can hold a variety of sensors.



Explain passive vs active (e.g. camera vs radar speed gun), whether you put in energy to take the measurements. Top is global elevation information from stereo satellite images. Bottom right is also elevation information over an Icelandic icecap from airborne laser scanning. Bottom left is roughness information over all of Antarctica.



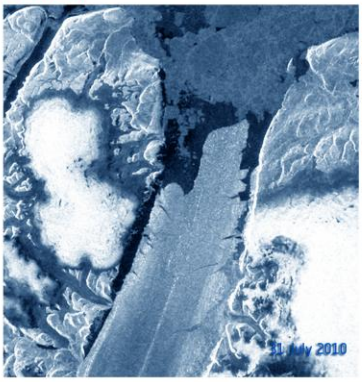
Bottom left is sulfur dioxide daily product (environmental parameters). Bottom right is a MODIS image of northeast Greenland. Top right is high resolution airborne multispectral (like digital photography) of Icelandic glacier. Top left is an example of a passive satellite sensor.



e.g. measuring all of Antarctica at the same time, or catching a picture of Arctic Sea Ice all at one time. These are globally-important measurements related to climate change. Also, even though some data can be measured on the ground, expedition cost a LOT, are logistically very difficult, and can be dangerous. When there is data freely available to the user community (through ESA and NASA), why would you use anything else?

Conclusion

- http://lance.nasa.gov/imagery/rapid-response/
- http://earthobservatory.nasa.gov/Features/category.php?cat_id=16
- http://www.esa.int/esaEO/index.html
- www.polarnetwork.org
- www.apecs.is
- www.eotechcluster.org.uk



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Wrap up with simple examples of Polar remote sensing given earlier, say how it's still a developing field (e.g. new satellites, new techniques, new questions), and you can follow up on these links. Any questions?