

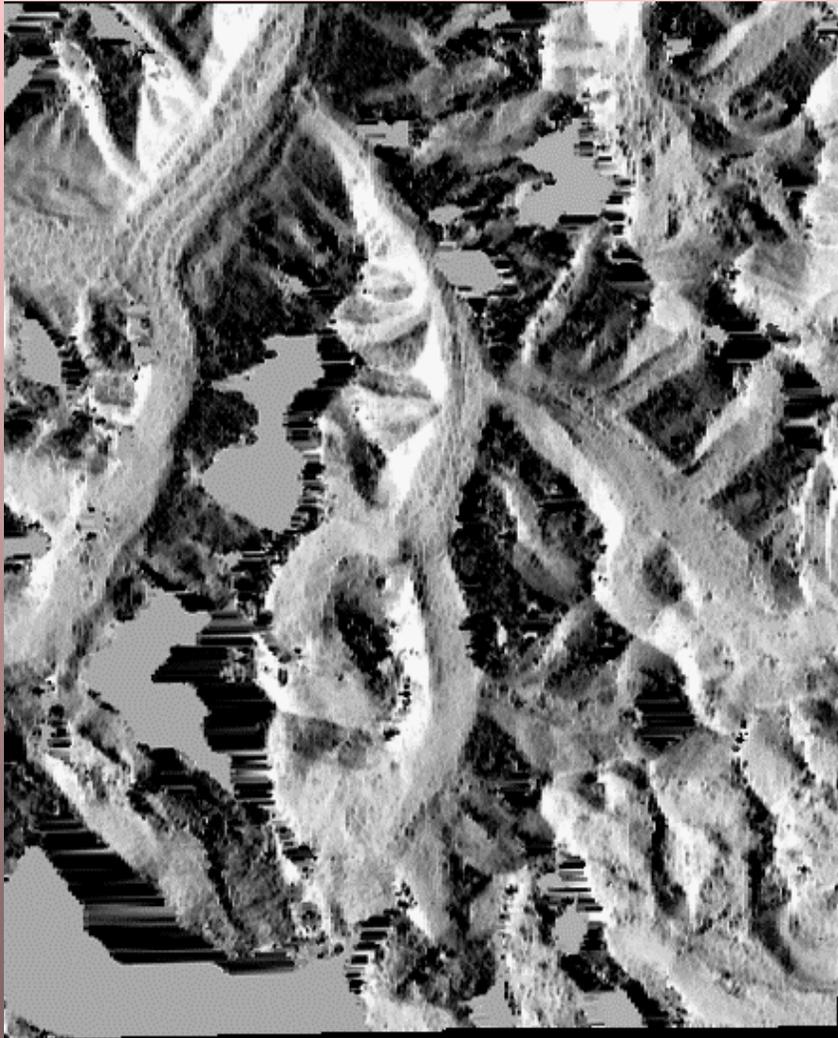
SNOW COVER MAPPING - COMMON SENSORS USED

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For AGRY 598
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Parameters and Types of Sensors

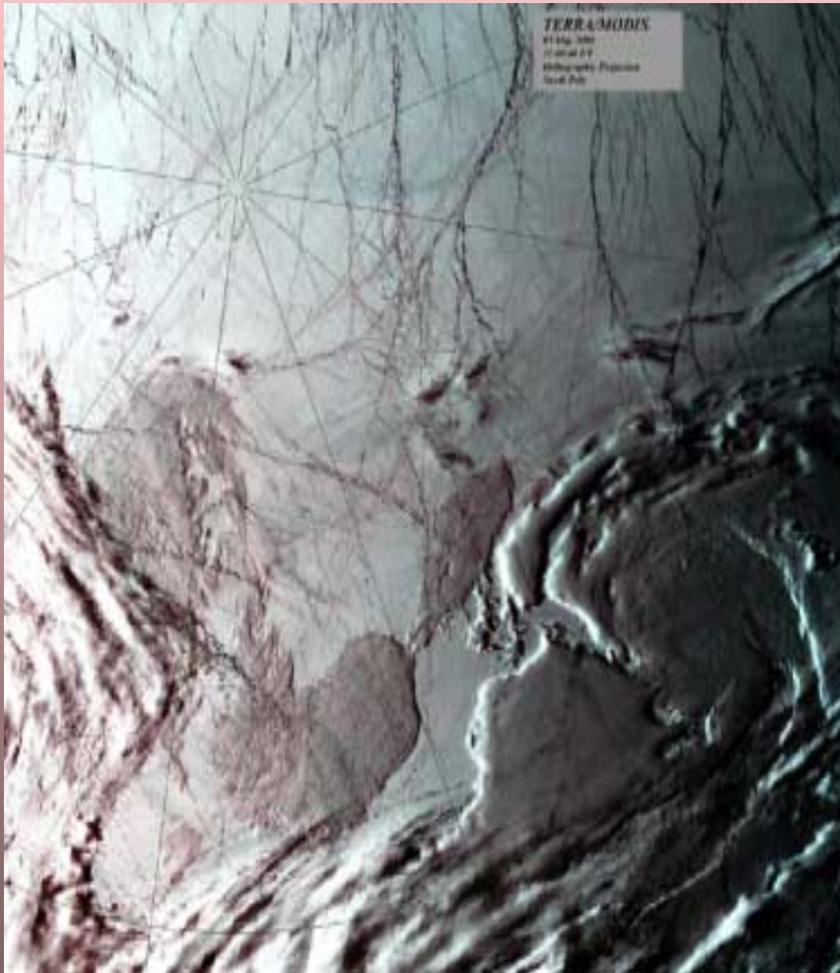
Parameter	Type of Sensor	Example
Ice Sheet Elevation	Radar Altimeter	RA ERS-2
Surface Temperature	Thermal IR	MODIS (Moderate Resolution Imaging Spectroradiometer)
Ice Velocity	Synthetic Aperture Radar	RADARSAT
Sea Ice Extent	Moderate Resolution Visible	AVHRR
Sea Ice Concentration	Passive Microwave	SSM/I

RADAR



- Images of mountainous terrain often appear dominated by topography.
- The inherent scattering properties of the surface are obscured.
- With knowledge of local incidence angle (through a dem), terrain effects can be minimized.

Moderate Resolution Imaging Spectroradiometer



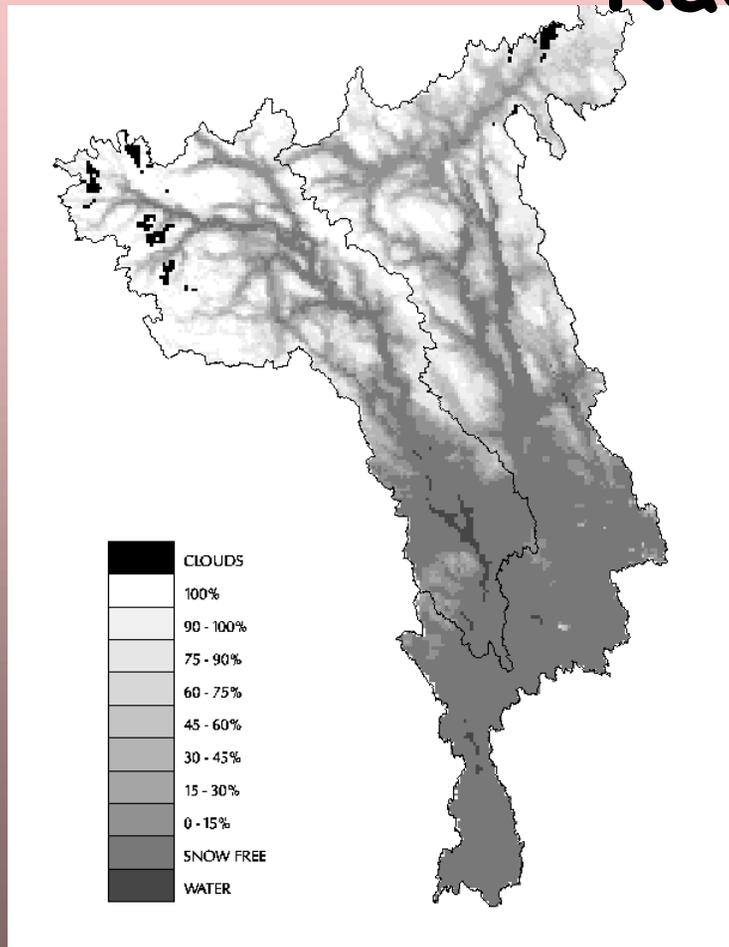
- MODIS is among one of the new sensors, carried by the EOS Terra satellite since 1999.
- MODIS covers the entire earth every one to two days, collecting data in thirty-six spectral bands from 0.62 to 14.385 micrometers.

MODIS Composite Image of North Pole, Grid Superimposed

Synthetic Aperture Radar

- In polar regions, persistent cloud cover and lack of sunlight hinder the use of optical and IR instruments.
- Visible and near IR sensors record reflected solar radiation, so they are of limited use during periods of darkness.
- There is therefore a lot of interest in the use of microwave instruments, especially SAR, to monitor polar regions.

Advanced Very High Resolution Radiometer



- The primary sensor of the NOAA polar-orbiting satellites is an imager known as the Advanced Very High Resolution Radiometer (AVHRR).
- This instrument makes calibrated measurements of visible, near-infrared, and infrared radiation from the Earth and its atmosphere.

Snow cover in the Glomma - Lågen catchment on 22 May 1995.

<http://webben.nve.no/hydrologi/bre/remote/ewra97.html>

Conclusion

- Remote Sensing sensors have contributed to our understanding of the composition and physical processes of remote corners of the globe.
- According to a recent news article from NSIDC,(7 December 2002),it was discovered that the arctic sea ice is shrinking and the Greenland ice sheet is actually melting.
- This was just an example to prove that today these satellites play a critical role in monitoring changes in the sensitive cryosphere--changes that may be indicative of regional or global climate change.