Availability and Characteristics of Satellite Data for Global Snow Mapping

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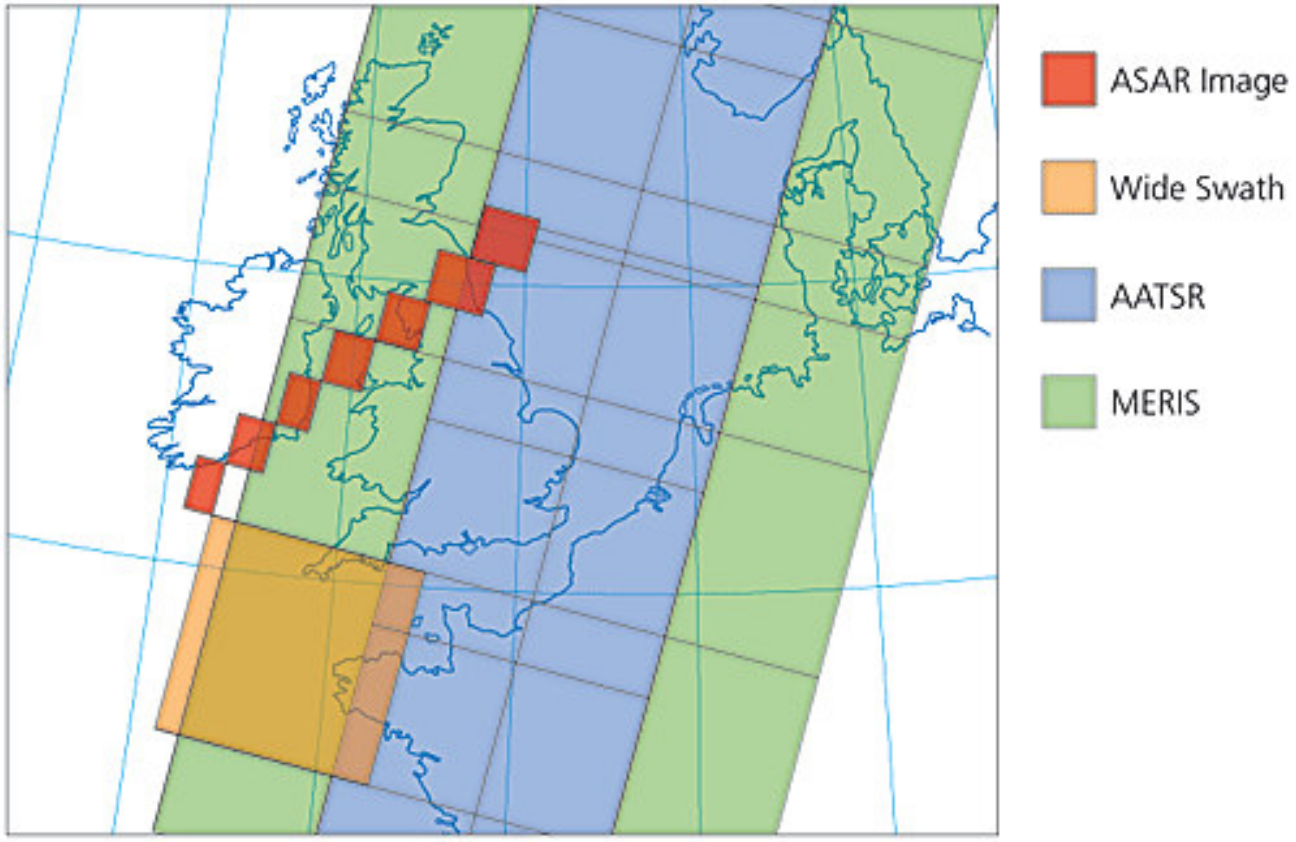
Time Series and Repeat Observation Interval for various Sensors applicable to Snow Mapping

Satellite	Sensor	Coverage	Repeat Acqu.	95	96	97	98	99	00	01	02	03	04	05	06	07	08
SAR Sensors																	
ERS-1/2	SAR	Regional	on demand														
ENVISAT	ASAR	Regional	on demand														
Radarsat	SAR	Regional	on demand														
Optical Sensors																	
ENVISAT	MERIS	Global	2-4 days														
ENVISAT	AATSR	Global	4 d														
ERS-1/2	ATSR-2	Global	4 d														
Terra, Aqua	MODIS	Global	1-2 days														
NOAA POES	AVHRR	Global	1 d														
SPOT	Vegetation	Global	1 d														
METEOSAT, etc.	MVIRI	Global	< 1h														
MSG; etc.	SEVIRI	Global	< 1h														

Envisat Sensor Coverage

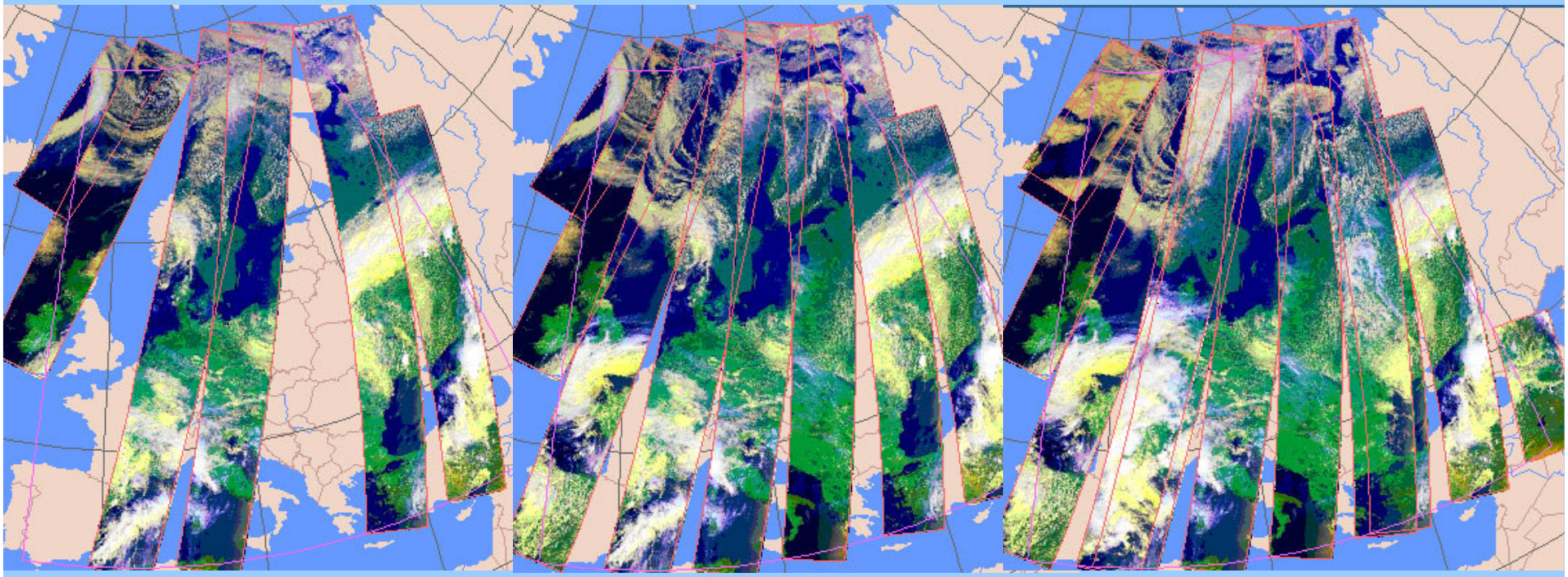


ATSR Repeat Coverage Europe

2 Day

3 Day

4 Day



Geostationary Satellites

Advantage

- **Frequent repeat observation**

Drawbacks

- **Significant decrease in spatial resolution at latitude >50°**
- **Meteosat MVIRI (1st gen.) has poor spectral capabilities for snow/cloud discrimination**
- **Availability of data from various operating agencies?**

Polar Orbiting Satellites

Many options available

MODIS: good spectral capabilities and spatial resolution; well calibrated; global data sets available;

Time series starts in the year 2000

MERIS: well calibrated; spectral channels for snow/cloud discrimination missing; ca. 3 day revisit at mid-latitudes

Time series starts in late 2002

ATSR-2, AATSR: good spectral capabilities, well calibrated; global data set; ca. 4 day revisit at mid-latitudes

Time series starts in the year 1995

AVHRR: Longest time series; good spectral capabilities; global data sets; format and calibration?

C-band SAR Capabilities and Constraints

Advantage

- **Not affected by clouds (useful for updating SE during snowmelt period)**

Drawbacks

- **Limited to detecting melting snow (not sensitive to dry snow)**
- **Problems in steep mountains and dense forests**
- **No global data sets available. Data availability varies with region and year**
- **ERS SAR data: narrow swath, low incidence angle, data availability restricted to mask of ground stations**
- **Data costs?**