

LANDSAT 8

From 11.2.2013 -
Climate, Environmental Change and Events

GÓUÐING VEÐURFRÆÐIFÉLAGSINS 27.2.2014

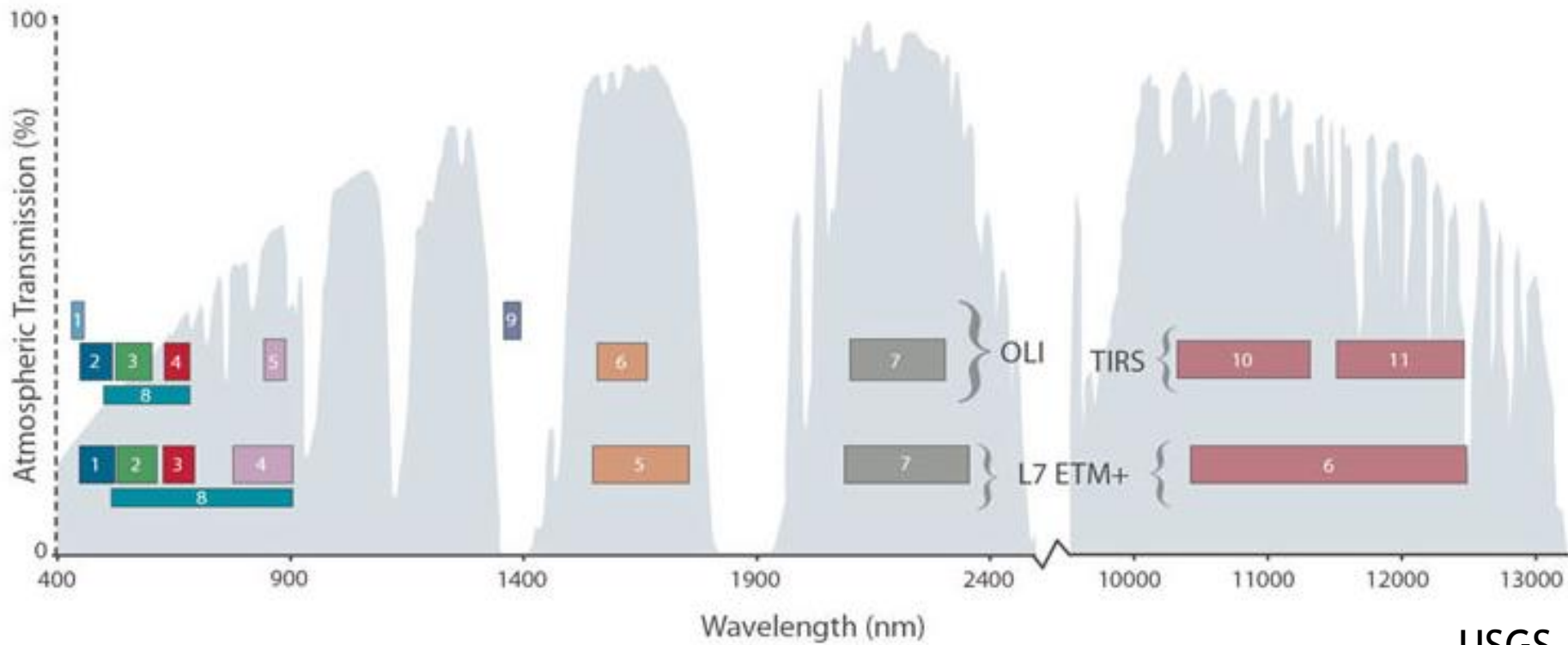
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Institute of Earth Sciences, University of Iceland

LANDSAT 1	23.7.1972 - 6.1.1978
LANDSAT 2	22.1.1975 - 22.1.1981
LANDSAT 3	5.3.1978 - 31.5.1983
LANDSAT 4	16.7.1982 - 14.12.1993
LANDSAT 5	1.3.1984 - still in orbit, NB lower 2013
LANDSAT 6	-
LANDSAT 7	15.4.1999 - still in orbit, NB lines 2003
LANDSAT 8	11.2.2013 - still in orbit

The LANDSAT time series

The longest time series of relatively high resolution satellite images with special care taken to create continuity of certain properties
Extremely important for environmental change studies due to many bands, including thermal bands. Free data easily available.



USGS

Continuity

Gradually, the number of bands has increased, geometric resolution improved as well as signal to noise ratio. Above is comparison between L-7 and L-8
 Pan band resolution L-8: 15 m L-1: 80 m

Band Number	μm	Resolution	
1	0.433–0.453	30 m	<i>Coastal</i>
2	0.450–0.515	30 m	<i>Blue</i>
3	0.525–0.600	30 m	<i>Green</i>
4	0.630–0.680	30 m	<i>Red</i>
5	0.845–0.885	30 m	<i>NIR</i>
6	1.560–1.660	60 m	<i>SWIR</i>
7	2.100–2.300	30 m	<i>SWIR</i>
8	0.500–0.680	15 m	<i>PAN</i>
9	1.360–1.390	30 m	<i>Cirrus</i>
10	10.6–11.2	100 m	<i>Thermal</i>
11	11.5–12.5	100 m	<i>Thermal</i>

NASA & USGS
esri.com

LANDSAT 8 Bands

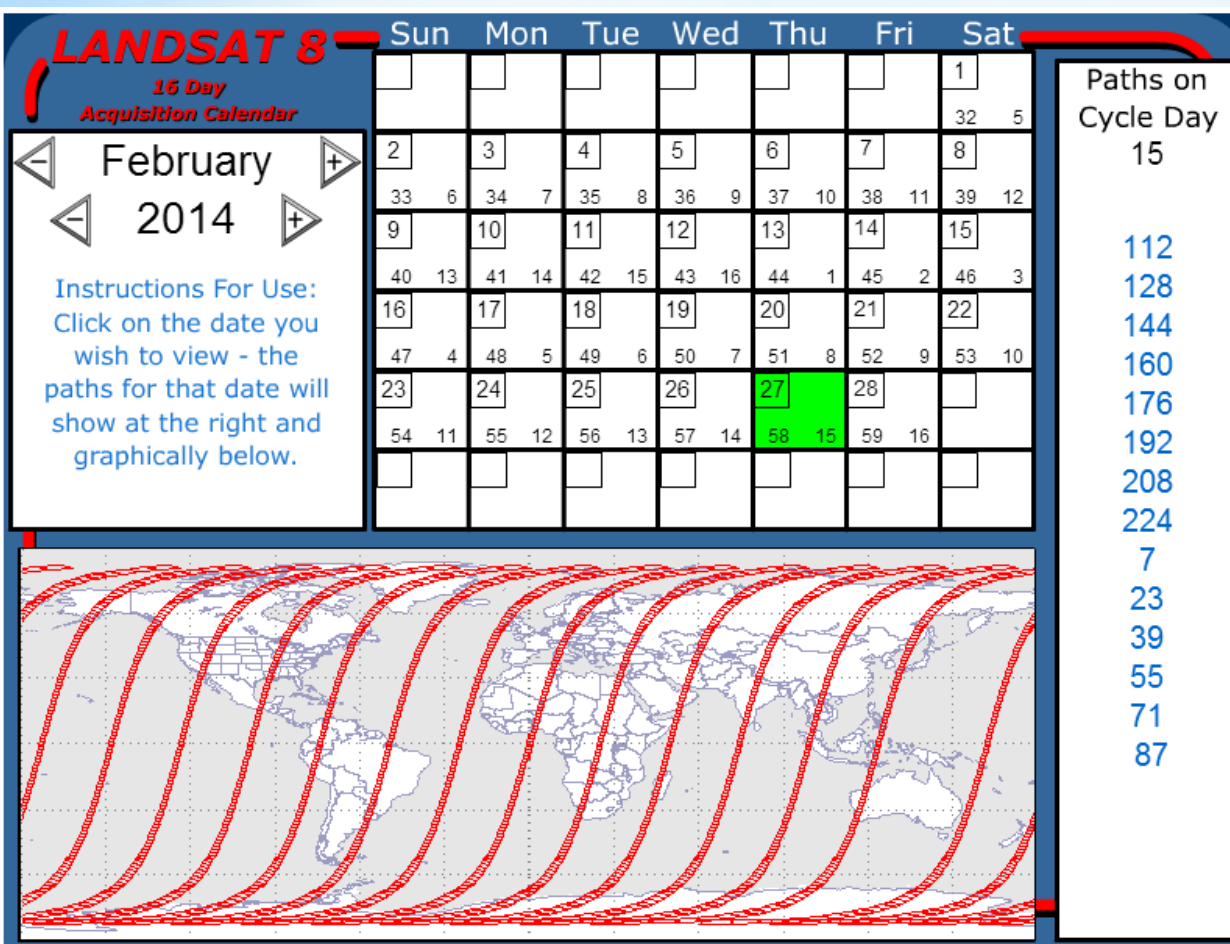
TIRS thermal infrared sensor (across track scanner)
Operational Land Imager (along track scanner)

RGB

Natural Color	4 3 2
False Color (urban)	7 6 4
Color Infrared (vegetation)	5 4 3
Agriculture	6 5 2
Atmospheric Penetration	7 6 5
Healthy Vegetation	5 6 2
Land/Water	5 6 4
Natural With Atmospheric Removal	7 5 3
Shortwave Infrared	7 5 4
Vegetation Analysis	6 5 4

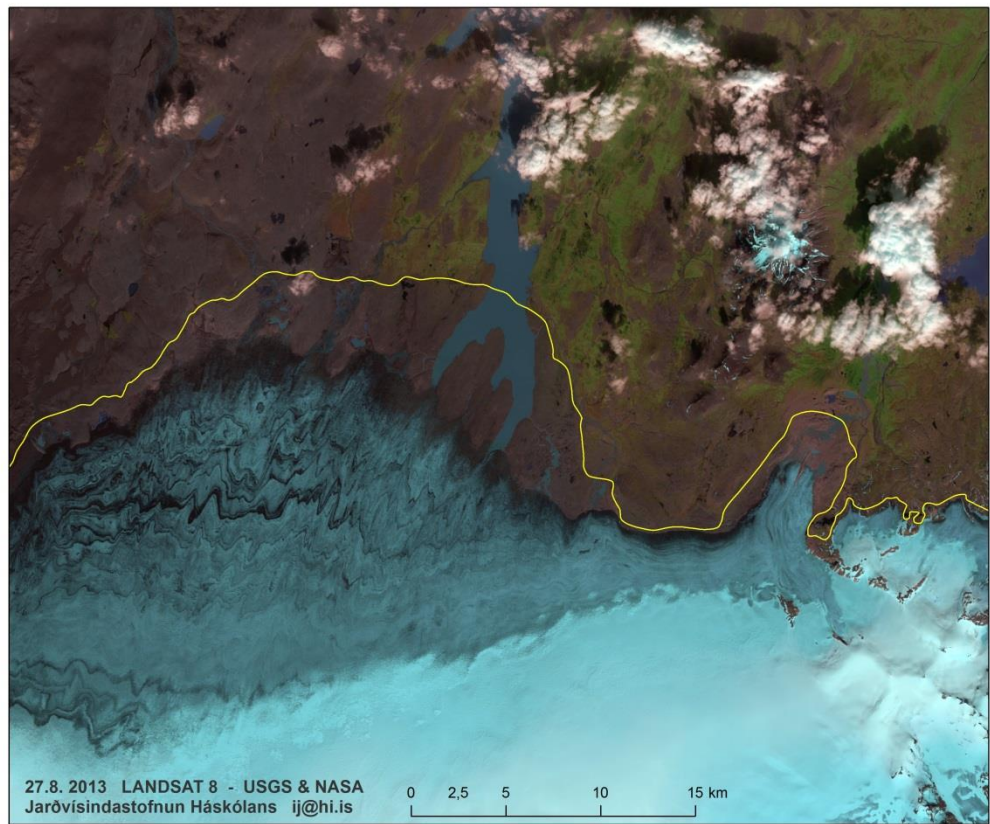
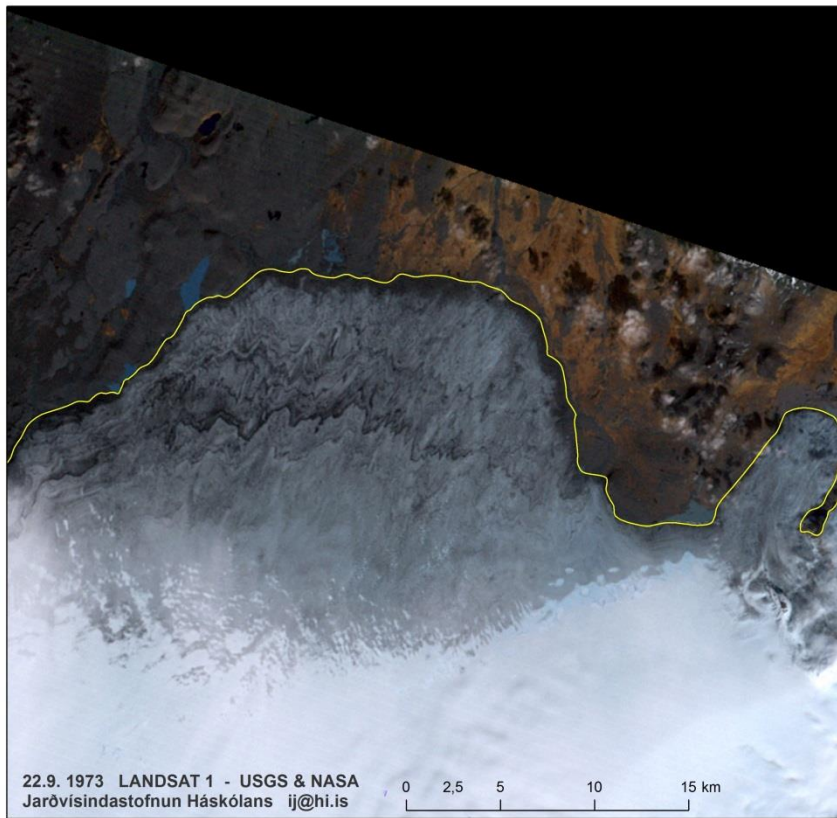
esri.com

Useful band combinations



Orbit

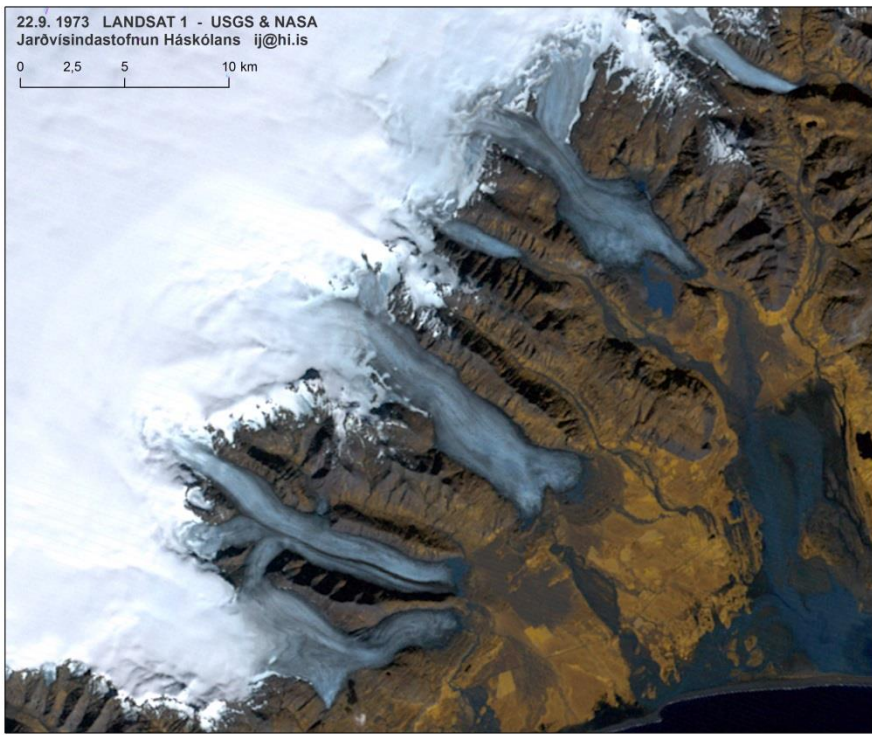
Sun synchronous - passes over the equator at about 10:00 in the morning
 LANDSAT 8 can cover the entire globe in 16 days, more often at high latitudes



Climate

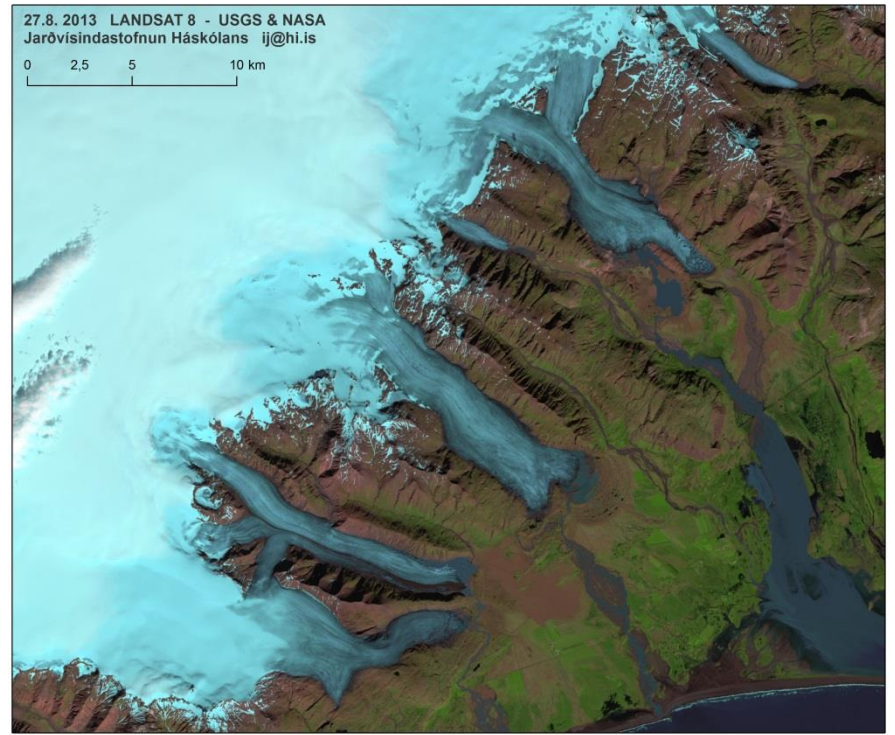
22.9. 1973 LANDSAT 1 - USGS & NASA
Jarövisindastofnun Háskólans ij@hi.is

0 2,5 5 10 km

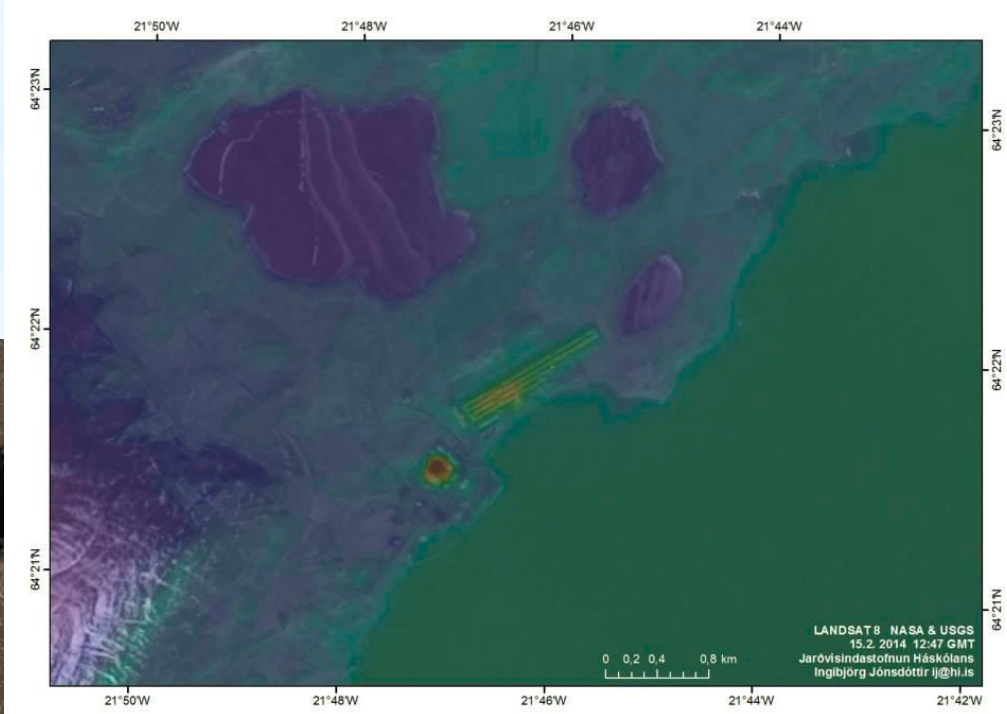


27.8. 2013 LANDSAT 8 - USGS & NASA
Jarövisindastofnun Háskólans ij@hi.is

0 2,5 5 10 km



Environmental Change

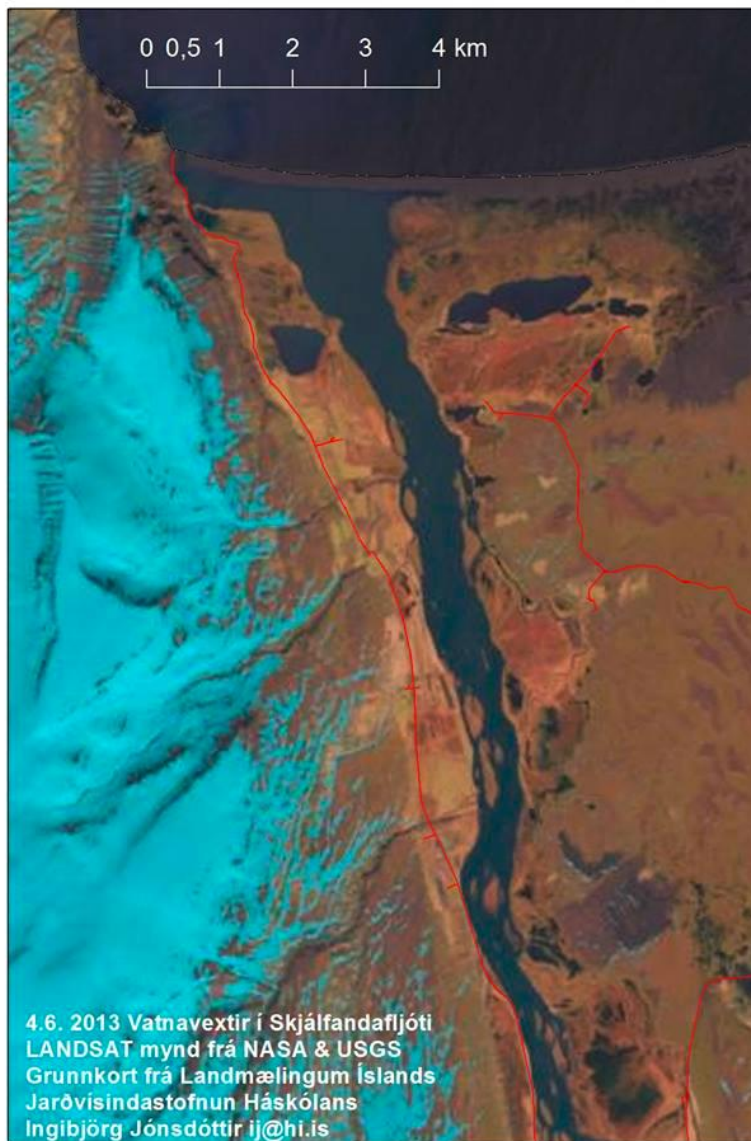


Events

LANDSAT 8 NASA & USGS
15.2.2014 12:47 GMT
Jarðvísindastofnun Háskólans
Ingibjörg Jónsdóttir ij@hi.is

4.6. 2013 Aurskriða við Ystafell
LANDSAT mynd frá NASA & USGS
Grunnkort frá Landmælingum Íslands
Jarðvísindastofnun Háskólans
Ingibjörg Jónsdóttir ij@hi.is





Relatively high geometric resolution

Many band combinations possible

About 2-3 images available every 2 weeks of any area in Iceland

Useful to get winter time images (long shadows, monitoring)

Important to have night time TIRS images since the sun affects during the day

Very many applications to the data

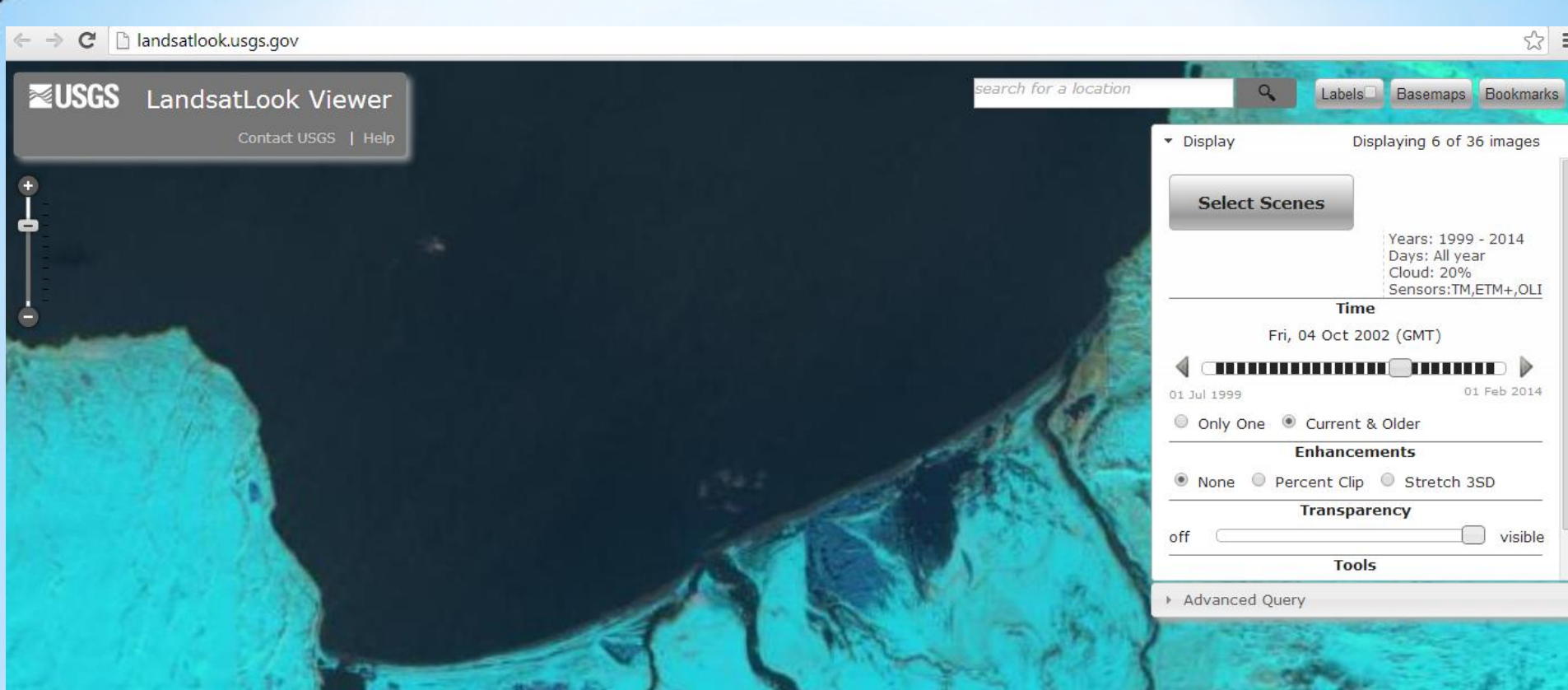
Important to process it and make it available

to different research groups and other people during certain events

Likely that more satellites will create better data coverage soon

Summary

Getting the images



LandsatLookViewer

Zoom to an area and view most available images from 1999-2014
Quick, but might not include all possible images, set band combination,
not full resolution, very helpful overview but certain data delay.

Search Criteria Data Sets Additional Criteria Results

1. Enter Search Criteria

To narrow your search area: type in an address or place name, enter coordinates or click the map to define your search area (for advanced map tools, view the [help documentation](#)), and/or choose a date range.

Address/Place Path/Row Feature Circle

Show Clear

Coordinates Predefined Area Shapefile KML

Degree/Minute/Second Decimal

1. Lat: 66° 48' 33" N, Lon: 022° 51' 05" W	🗹	✖
2. Lat: 65° 34' 03" N, Lon: 024° 49' 44" W	🗹	✖
3. Lat: 63° 39' 56" N, Lon: 023° 06' 54" W	🗹	✖
4. Lat: 62° 58' 30" N, Lon: 018° 22' 08" W	🗹	✖
5. Lat: 65° 00' 59" N, Lon: 011° 51' 54" W	🗹	✖
6. Lat: 67° 12' 14" N, Lon: 015° 09' 39" W	🗹	✖

Use Map Add Coordinate Clear Coordinates

Date Range Result Options

Search from: 02/01/2014 to: 02/27/2014

Search Criteria Summary (S)

Download Options

Please select from the following download options:

- LandsatLook "Natural Color" Image (3.9 MB)
- LandsatLook "Thermal" Image (1.3 MB)
- LandsatLook "Quality" Image (1.7 MB)
- LandsatLook images with Geographic Reference (6.8 MB)
- Level 1 GeoTIFF Data Product (879.4 MB)

Select Download Option Cancel

EarthExplorer

Full resolution data from all bands available about 6 hours after orbit. Possible to search the entire LANDSAT 1-8 dataset, most images are readily available in full resolution and as quicklook, but some of the older images have to be ordered (free of charge). Registration required but free. Easy to search according to area, date and data quality. Other images available.