

Examples of radar remote sensing in Natural Resources Wales (NRW)

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Flooding – February 2020



 **Cyfoeth Naturiol Cymru | Natural Resources Wales**  
@NatResWales

 We're continuing to keep a close eye on river levels on the Wye at Monmouth, after the river reached record-breaking levels earlier this morning.



12:38 PM · Feb 18, 2020 

 22  See Cyfoeth Naturiol Cymru | Natural Resources Wales's o...

Visualisation – Sentinel Hub

<https://www.sentinel-hub.com/>

The image shows the Sentinel Hub Playground interface. At the top, there is a navigation bar with the Sentinel Hub logo, the text "Playground", a date "2020-02-17", and a search bar containing "Monmouth, Monm". Below the navigation bar is a rendering menu with two tabs: "Rendering" and "Effects". The "Rendering" tab is active and contains a list of rendering options, each with a small circular preview icon:

- Custom
- Enhanced visualization
- Enhanced visualization - orthorectified
- VV - linear gamma0 - orthorectified
- VV - linear gamma0
- VH - linear gamma0 - orthorectified
- VH - linear gamma0
- VV - decibel gamma0 - orthorectified
- VV - decibel gamma0
- VH - decibel gamma0 - orthorectified
- VH - decibel gamma0

At the bottom of the rendering menu is a "GENERATE" button. The main area of the interface displays a satellite image of a river valley, rendered in a false-color scheme where vegetation is green and yellow, and water is dark blue. A scale bar at the bottom right indicates a distance of 2 km. At the very bottom, there is a footer with the text "Get Sentinel and Landsat imagery in your GIS" and "OpenStreetMap © Sentinel Hub".



Copernicus Emergency Management Service (EMS)

COPERNICUS

Emergency Management Service

Copernicus Emergency Management Service - Mapping

A service in support of European emergency response



International Charter: Space and Major Disasters

Analysis Ready Data

EODATADOWN - AUTOMATED ARD & MONITORING

... Do not feel any concern about query parameters, please change and try again.

SELECT PERIOD, SENSOR AND REGION OF INTEREST

To use it it is best to select the date, month and sensor you are interested and then optionally select a cloud threshold and bounding box to define a region of interest. These panels for "Time Series" feature the cloud threshold and bounding box query parameters.

SELECT TIME PERIOD OF INTEREST (NOTE: SCENES ARE ORDERED, MOST RECENT FIRST)

Start:

End:

SELECT THE SENSOR OF INTEREST:

Sensor:

IF YOU SELECTED AN OPTICAL SENSOR, THEN YOU CAN SELECT A CLOUD PERCENTAGE THRESHOLD:

Cloud:

OPTIONALLY, SELECT A BOUNDING BOX FOR THE AREA OF INTEREST, IN DEGREES (EPSG: 4326). YOU CAN INTERACTIVELY SELECT AN AREA ON THE MAP BELOW.

NORTH-EAST CORNER (TOP-LEFT)

North:

East:

SOUTH-WEST CORNER (BOTTOM-RIGHT)

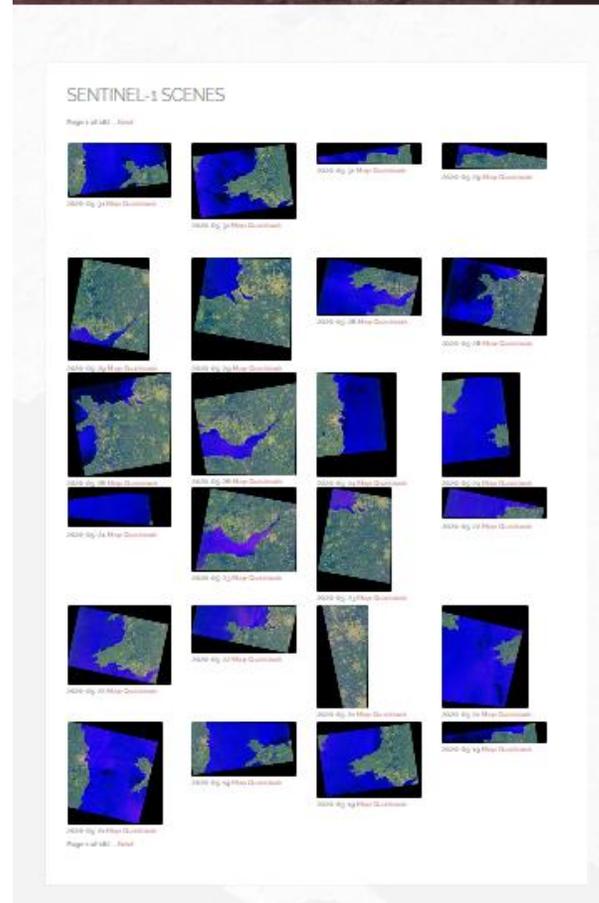
South:

West:

This can change on a set of the envelope, by dragging a corner and you just move the map for query the area of interest. The fields about are automatically updated.



EODATADOWN - AUTOMATED ARD & MONITORING

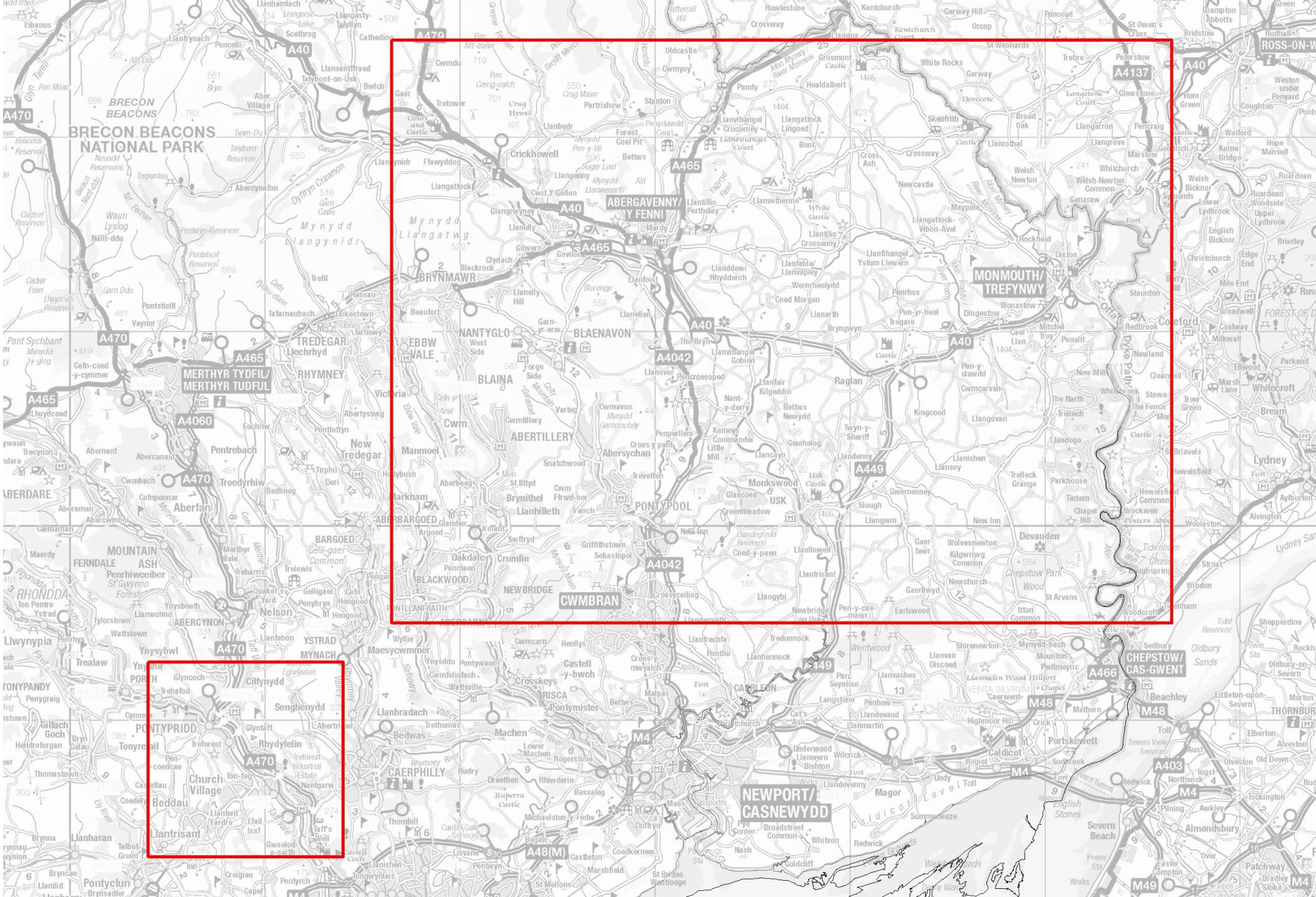


Sentinel 1
Sentinel 2
Landsat

Processed to ARD standards

The Remote Sensing and GIS Software Library (RSGISLib)

<https://www.rsgislib.org/>



BRECON BEACONS NATIONAL PARK



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BRECON BEACONS NATIONAL PARK

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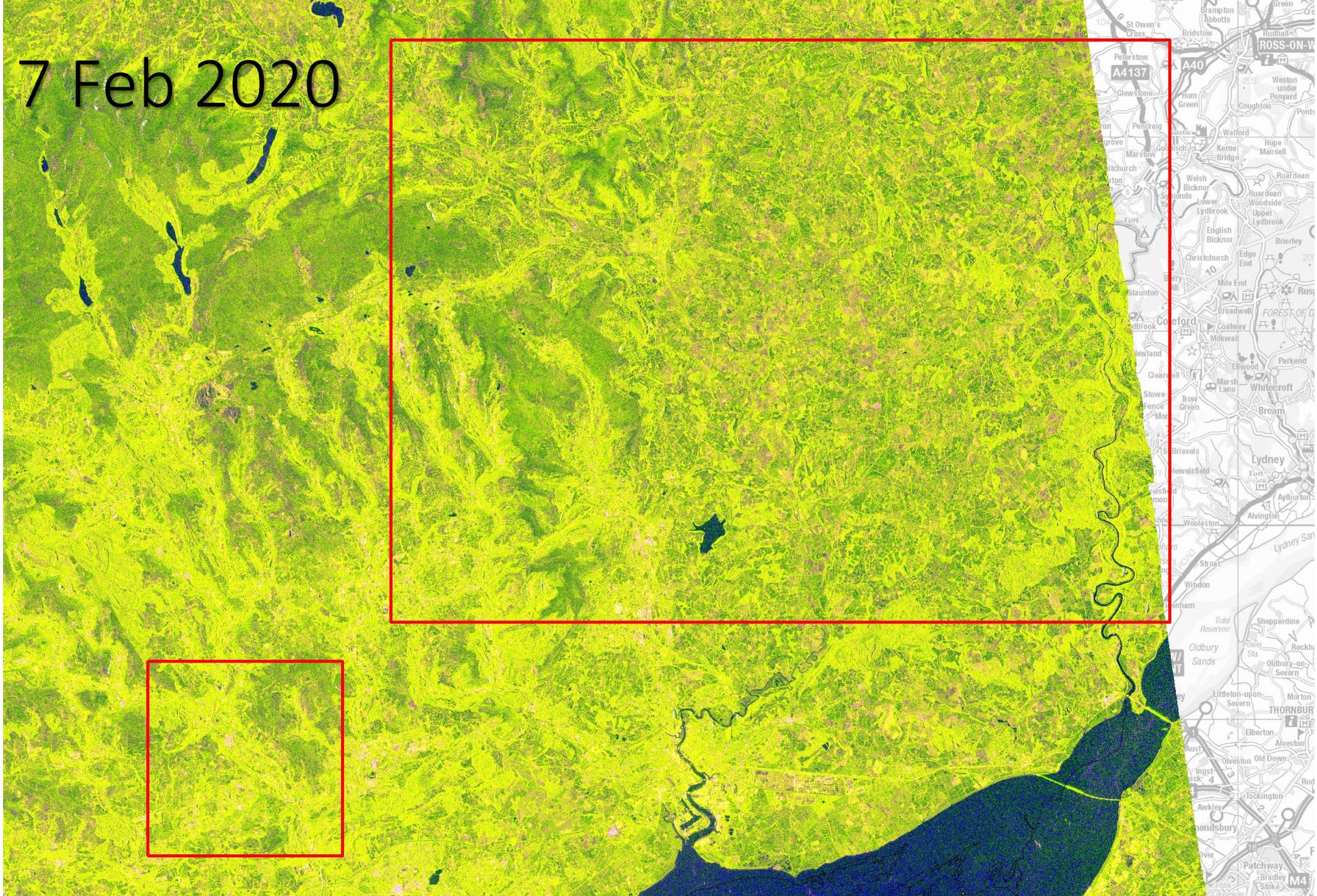
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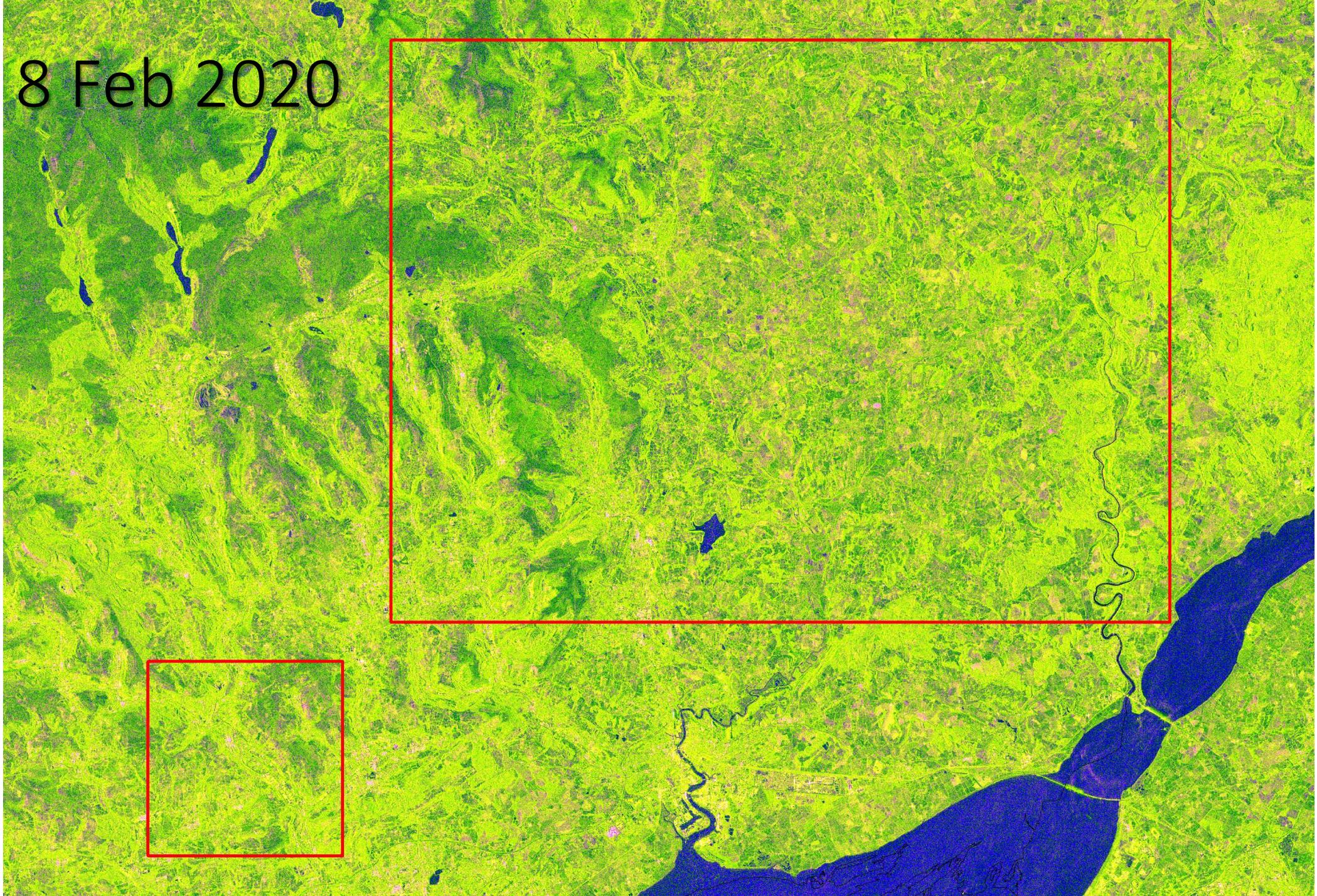
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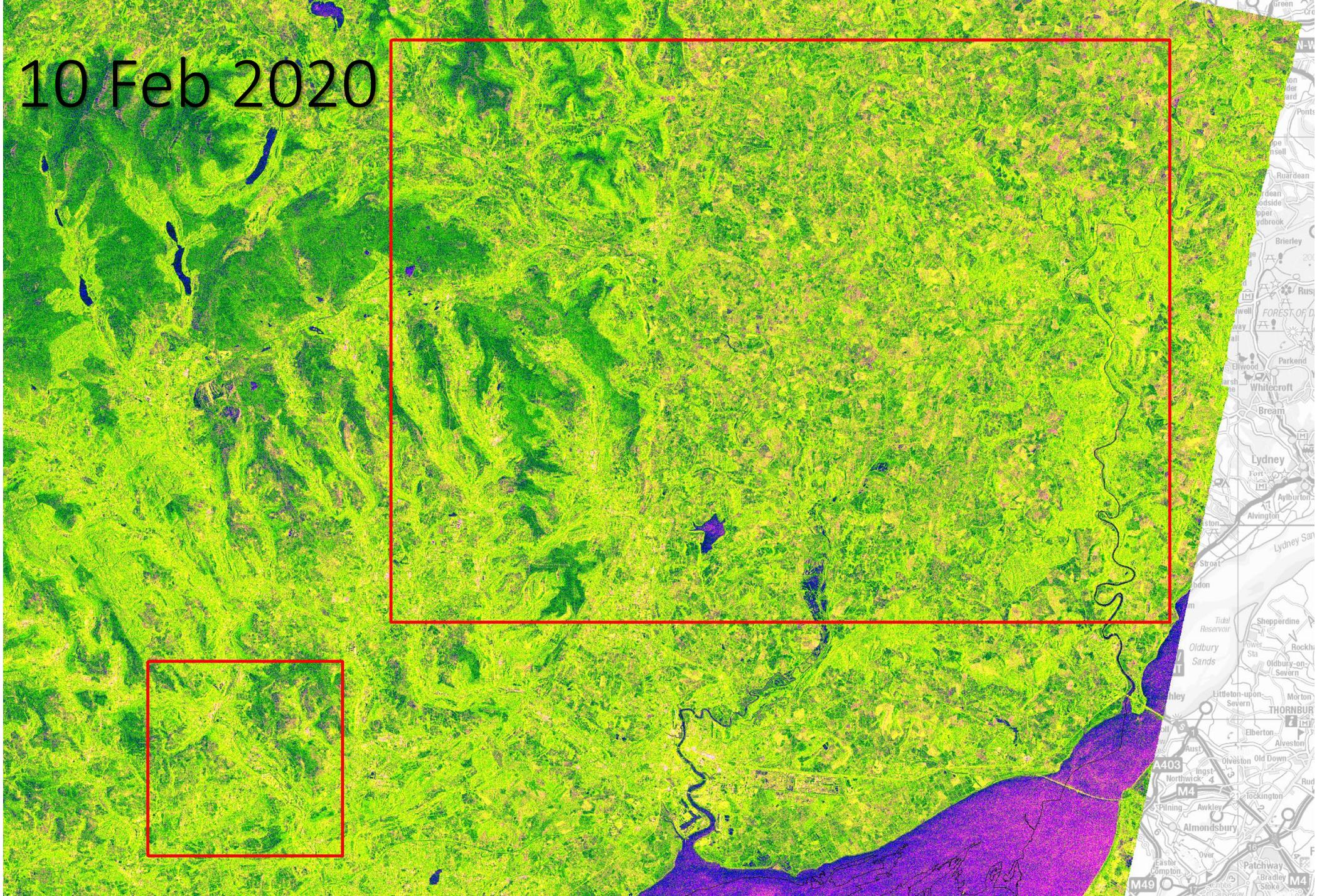
7 Feb 2020



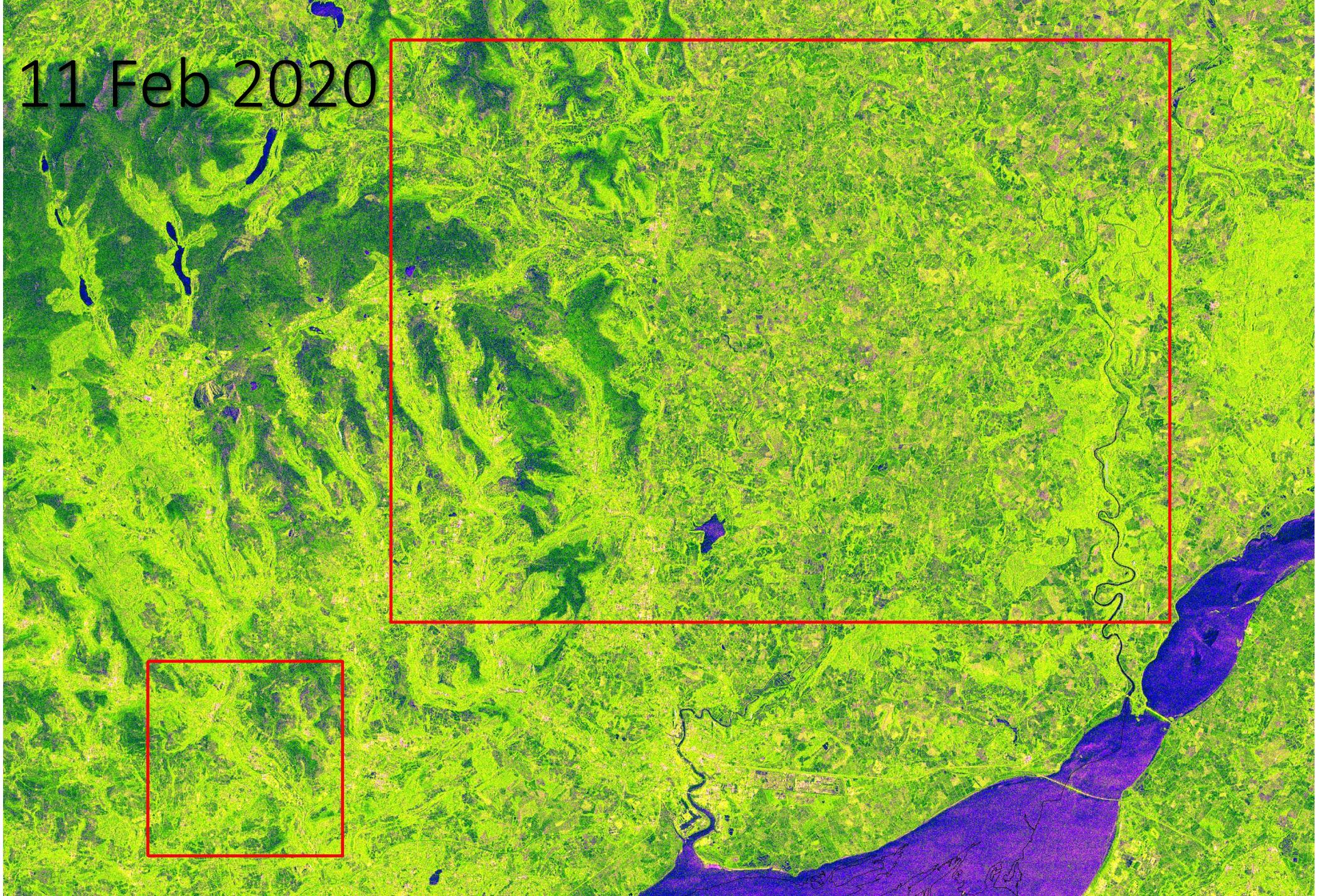
8 Feb 2020



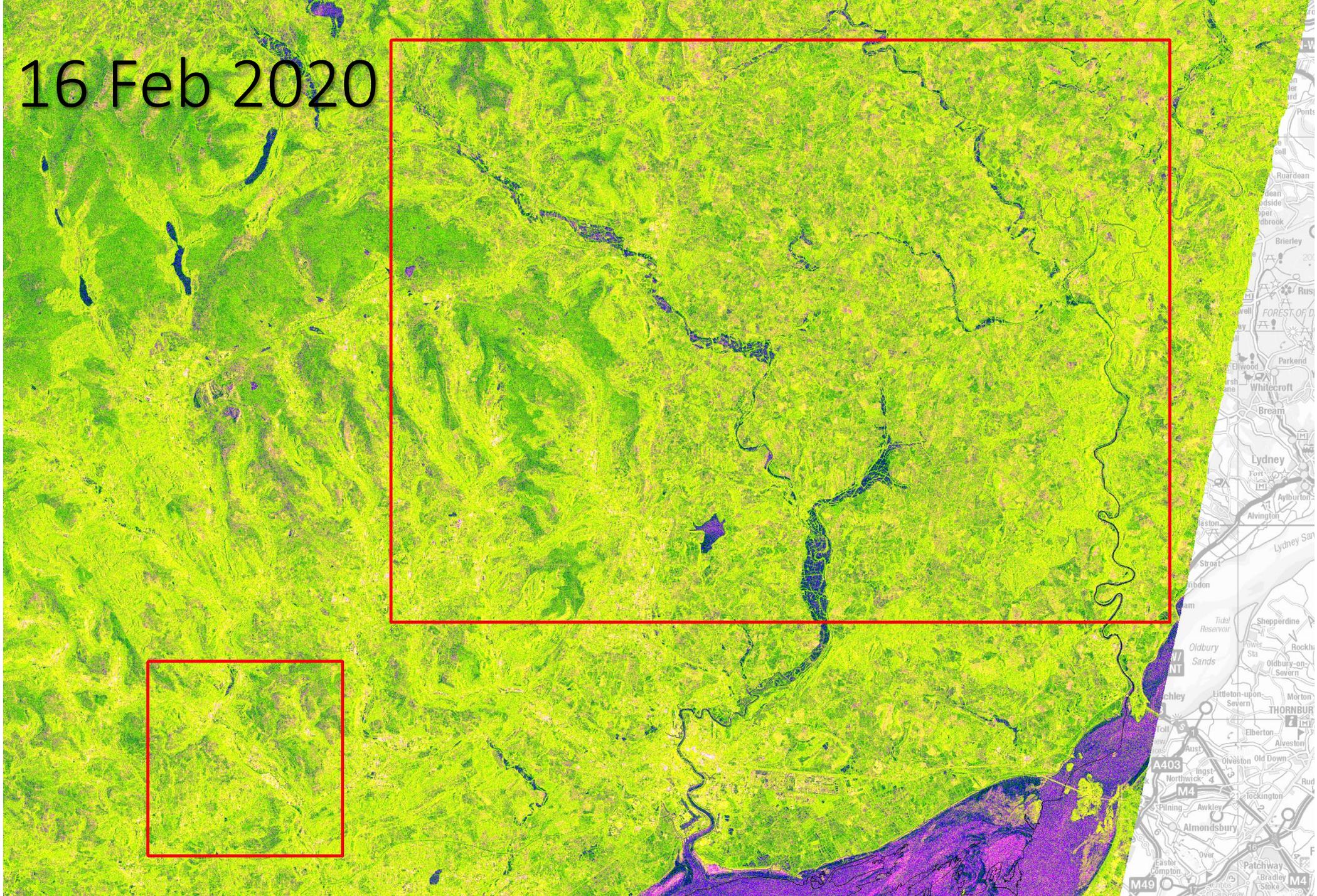
10 Feb 2020



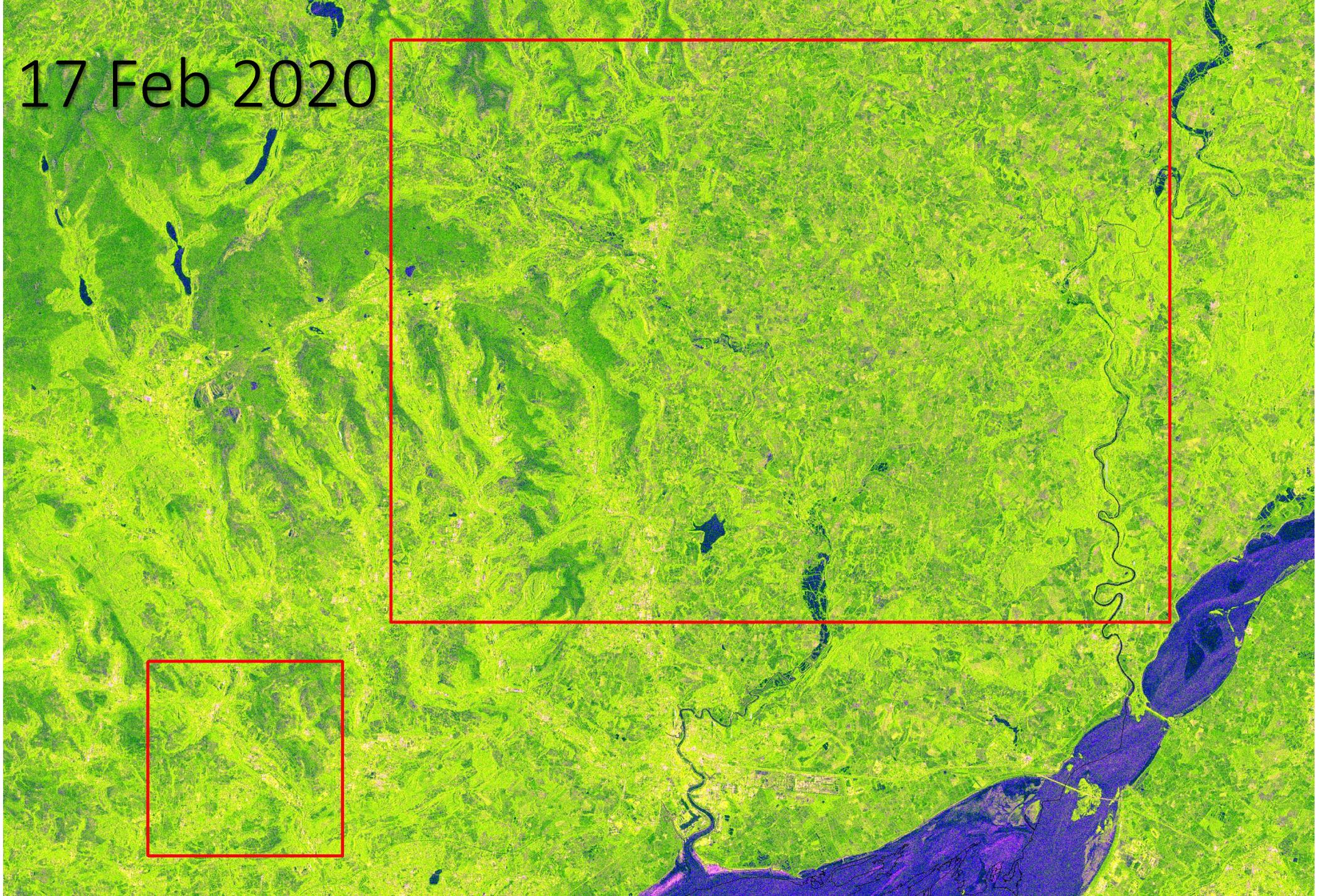
11 Feb 2020



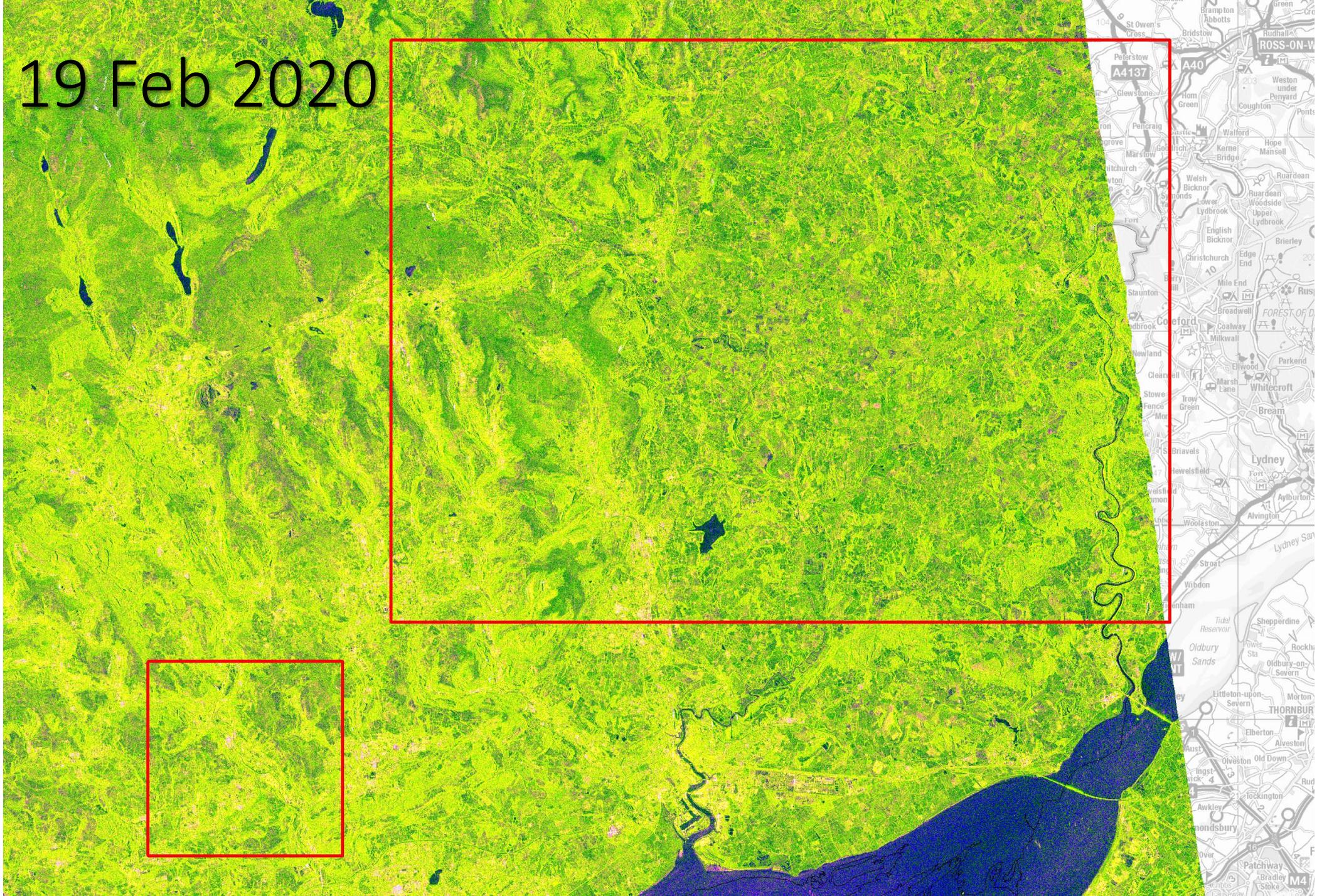
16 Feb 2020



17 Feb 2020



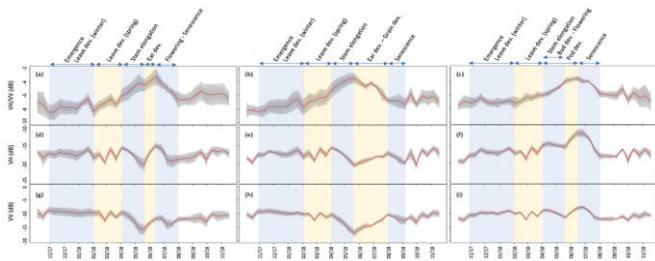
19 Feb 2020



Living Wales: Crop classification



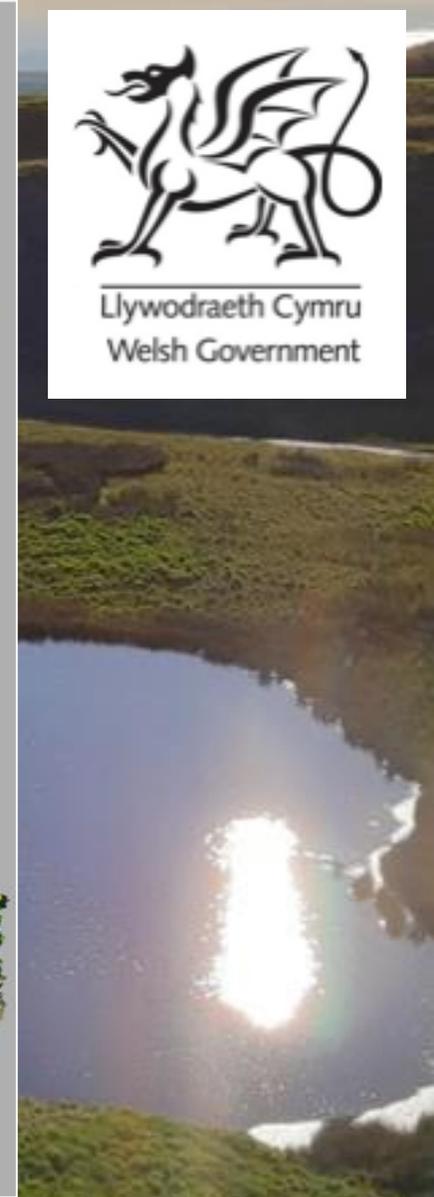
- | | | |
|-----------------|----------|---------------|
| Winter Barley | Maize | Spring Barley |
| Winter Rapeseed | Potatoes | Spring Wheat |
| Winter Wheat | Beets | Grassland |



Based on biophysics,
 allowing
 development
 tracking through the
 growth cycle



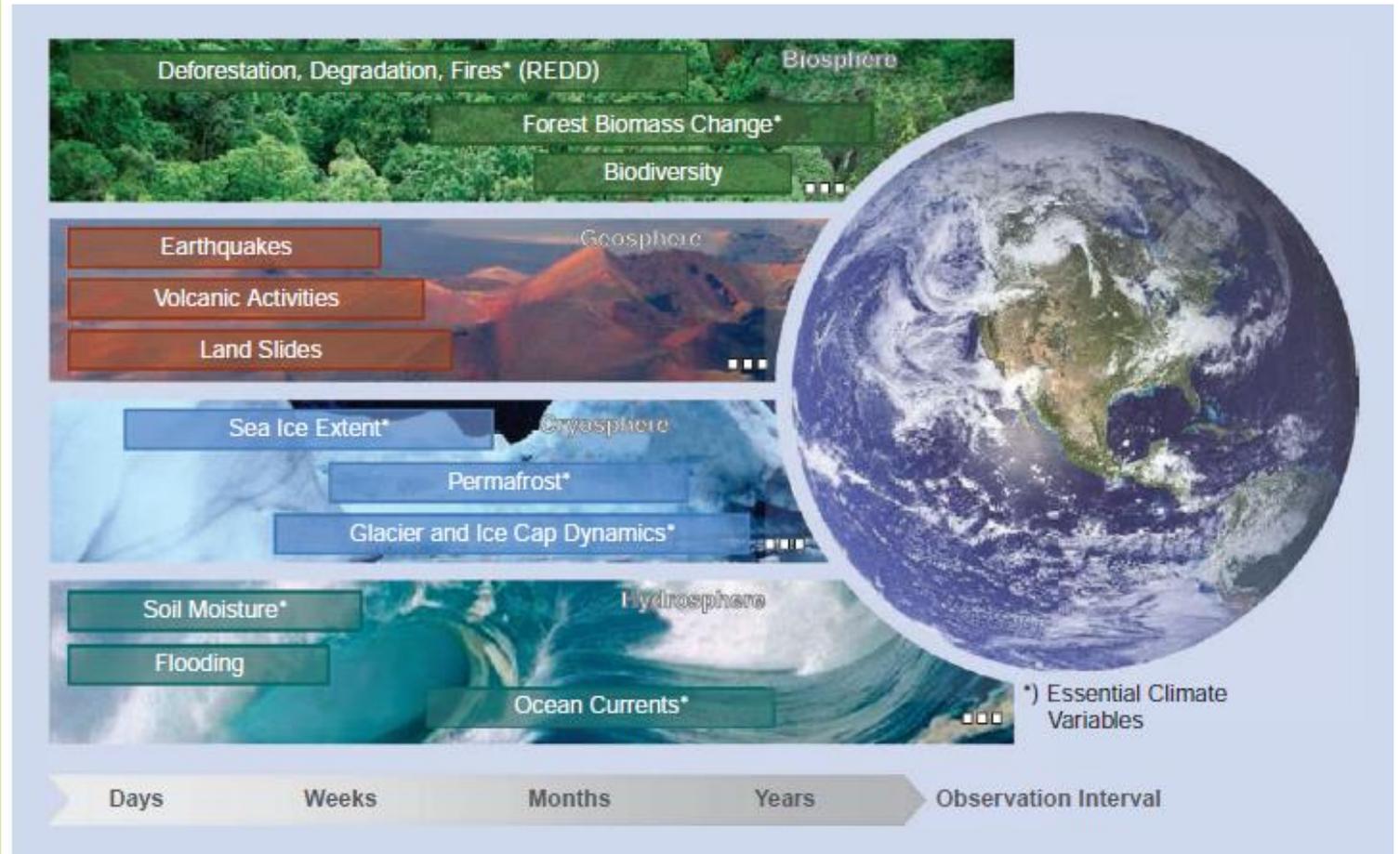
Planque et al. (2020)



Satellite Radar Interferometry: Applications

TABLE 7. COMPILATION OF INFORMATION EXTRACTION AND APPLICATION EXAMPLES FOR SAR IMAGERY. ESSENTIAL CLIMATE VARIABLES (ECV) AS DEFINED BY THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) ARE IDENTIFIED WITH “*”.

Land	Multi-purpose land surface imagery, soil type, land cover*, Earth topography (elevation and surface model), lake levels*, subsidence, landslides, erosion, earthquake and volcano monitoring, disaster monitoring, mitigation and assessment, flooding monitoring, coherent change detection, urban and infrastructure planning, road traffic monitoring, soil moisture*, wetlands monitoring, permafrost and seasonally-frozen ground*
Vegetation	Vegetation type, forest biomass*, forest biomass change, biodiversity, forest profile, forest height, fire disturbance and monitoring, crop classification, crop height, crop biomass, deforestation and forest degradation
Ocean	Multi-purpose ocean imagery, sea state*, ocean currents*, wind speed and vector over sea surface, bathymetry at coastal zones, wave height, ocean wavelength, wave direction, oil spill cover, ship monitoring
Sea ice	Sea-ice cover and extent, sea-ice type, sea-ice thickness, iceberg cover and movement, ship route optimization
Snow and land ice	Snow cover*, ice and glacier cover*, snow melting status (wet/dry), snow water equivalent, glacier motion and dynamics, glacier topography





Swansea
University
Prifysgol
Abertawe

**Evans
Ice Stream**



Weddell
Sea

Ronne
Ice Shelf

East Antarctic
Ice Sheet

Transantarctic
Mountains

West Antarctic
Ice Sheet

Amundsen
Sea

Ross Ice
Shelf

Ross Sea

West Antarctic Ice Sheet

Evans Ice Stream

Cape Zumberge

Ronne Ice Shelf

Flow direction

Look direction

Satellite Track

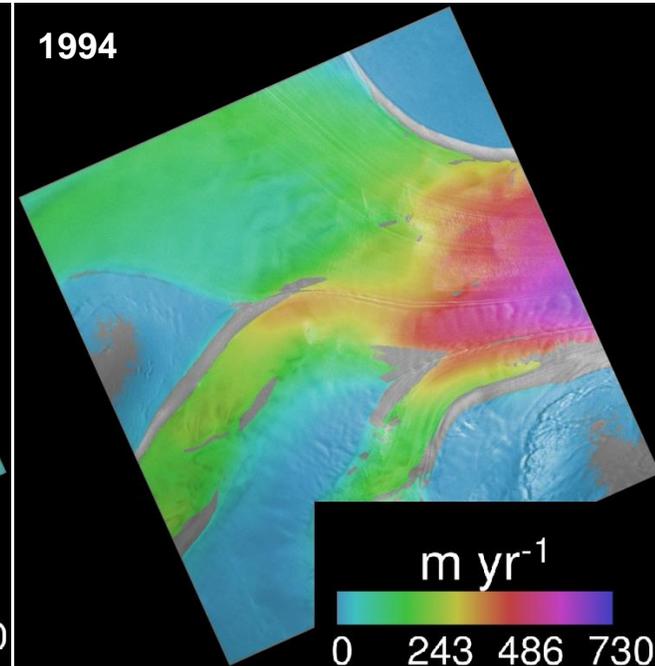
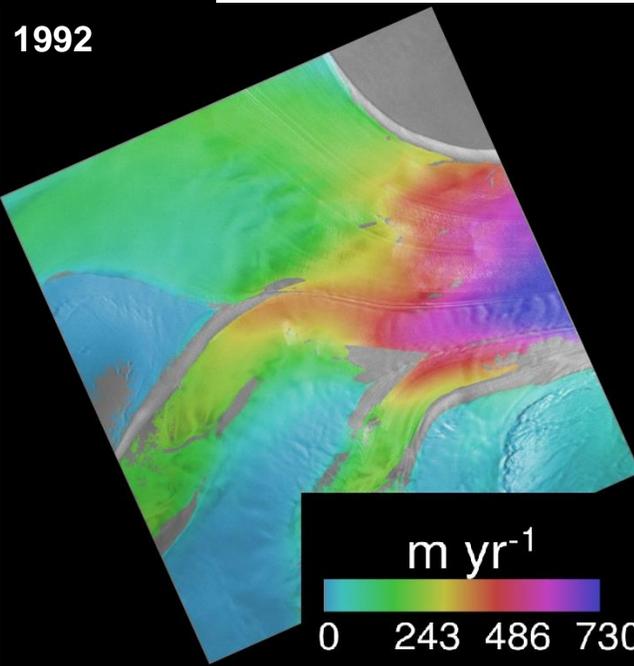
Fowler Peninsula

Bperp = 139m

Bperp = 144m



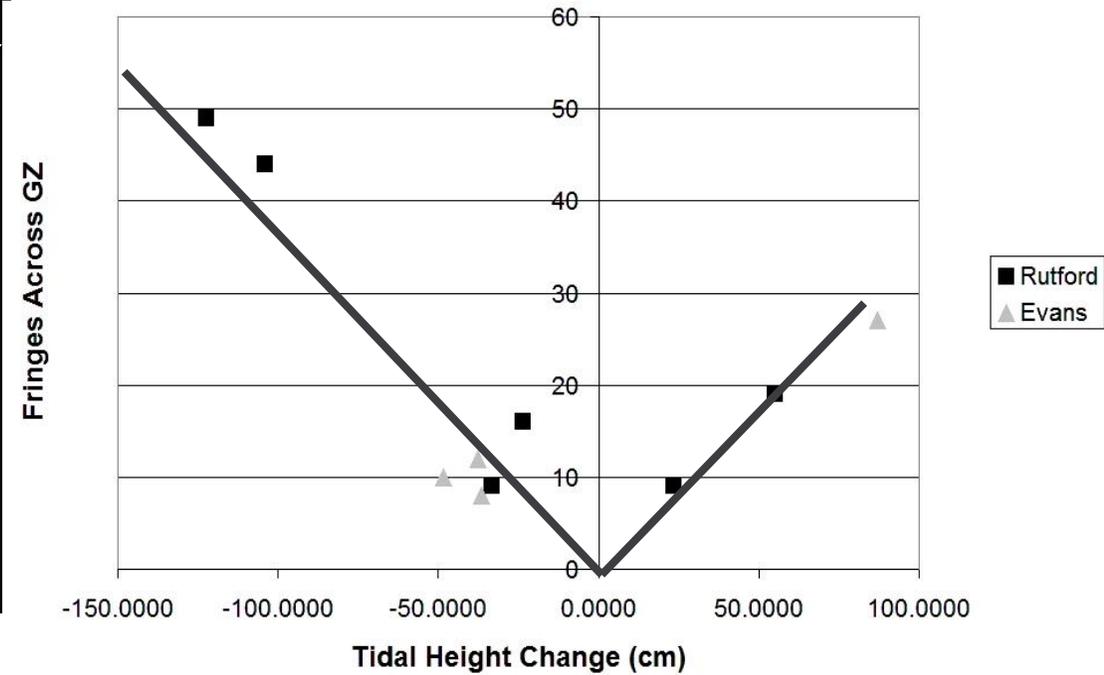
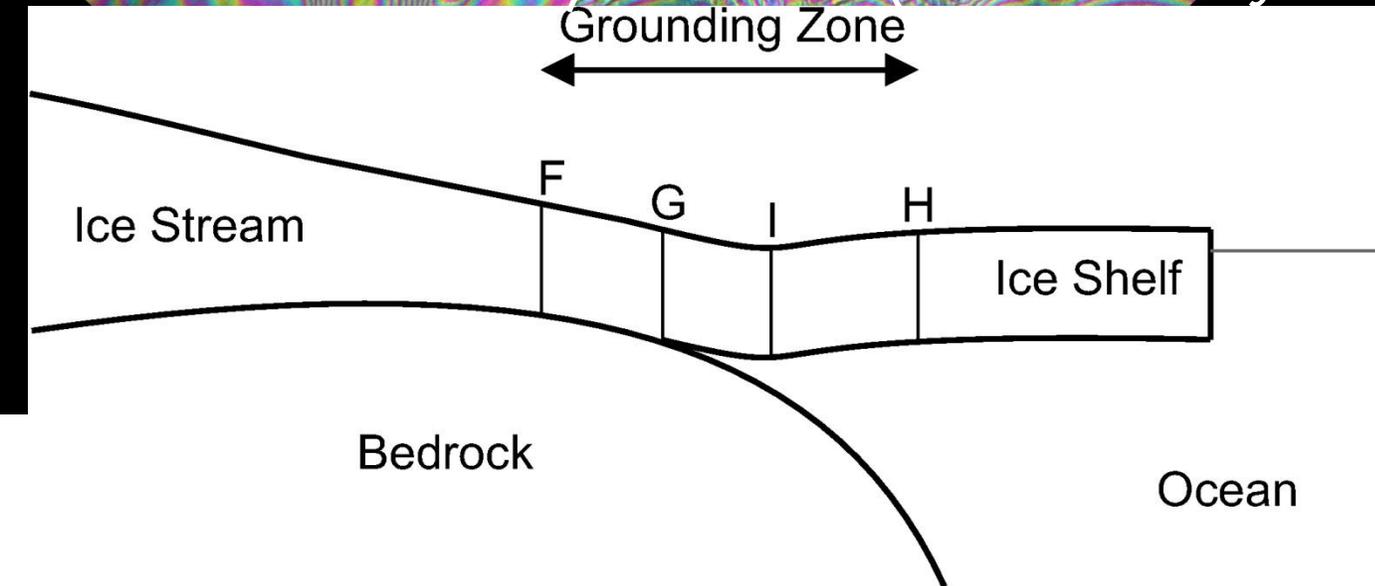
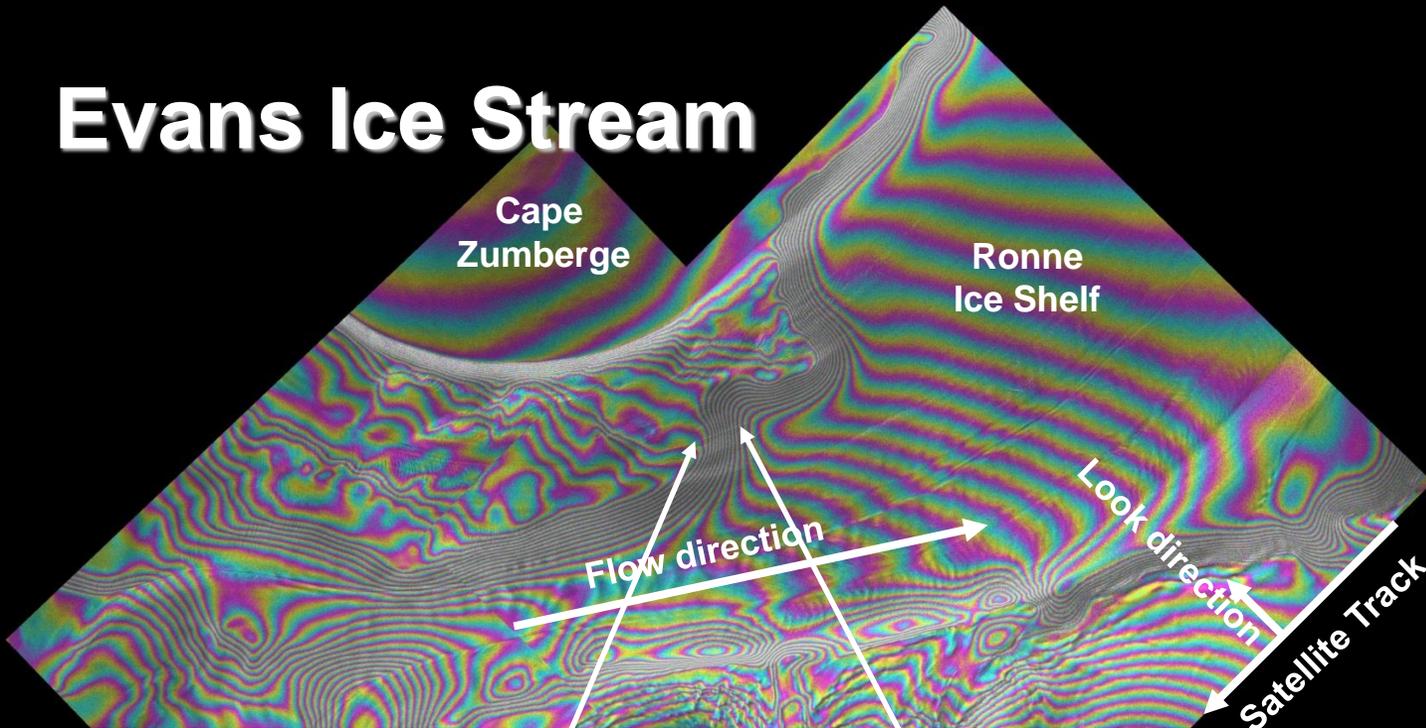
Swansea University
Prifysgol Abertawe



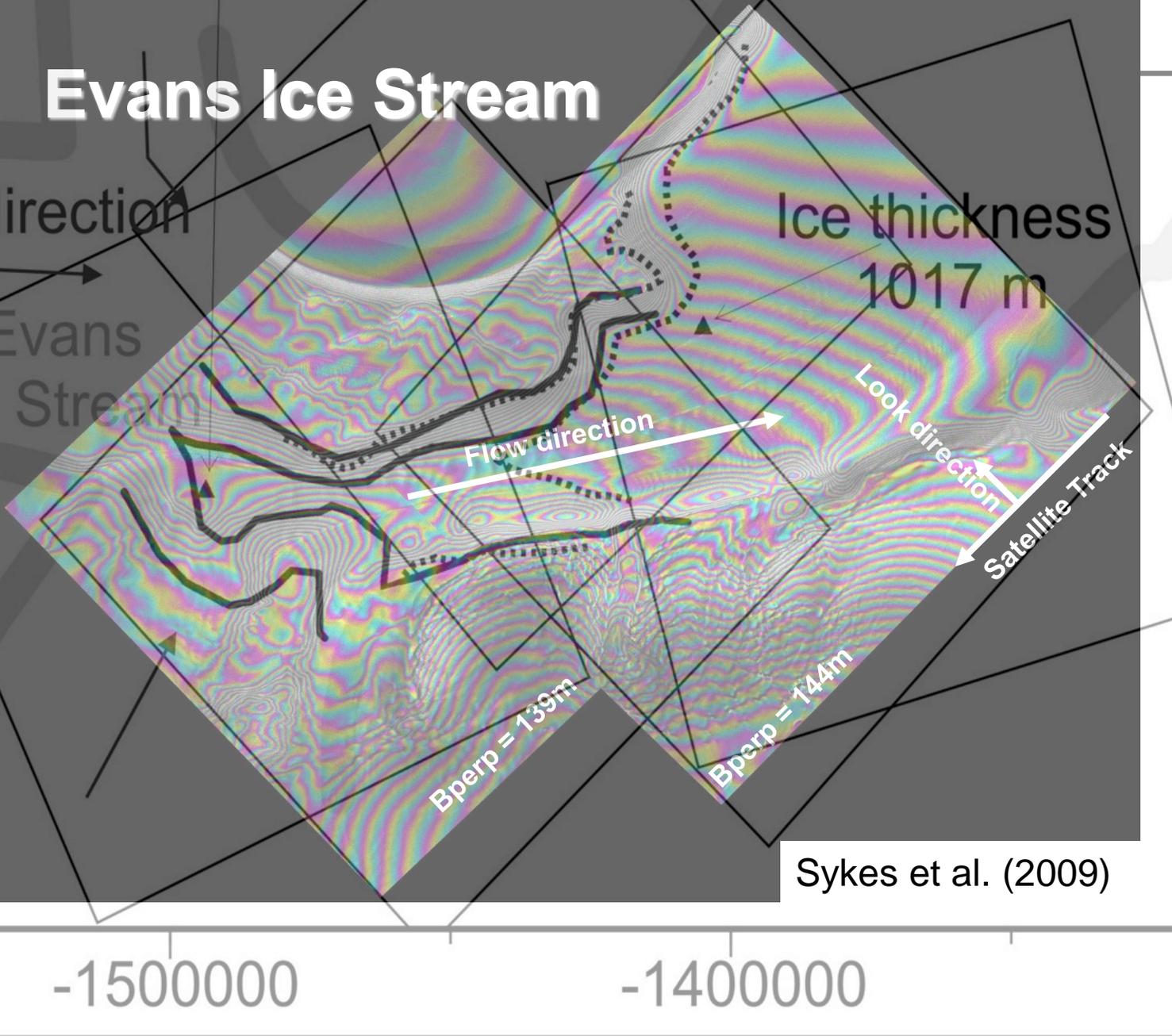
Evans Ice Stream



Swansea University
Prifysgol Abertawe



Evans Ice Stream



Sykes et al. (2009)

East side (top) is grounded and west side (bottom) is floating!

Access NRW data

<https://naturalresources.wales/evidence-and-data/access-our-data/>



Access Geospatial data for Wales

<https://lle.gov.wales/home>



Procurement

<https://www.sell2wales.gov.wales/>

Contact us

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