

UK Natural Capital Accounting update and Earth observation

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GEO EO4EA (Euphoria)
Copenhagen
29th March 2017



**SPECTO
NATURA**



**Centre for
Ecology & Hydrology**
NATURAL ENVIRONMENT RESEARCH COUNCIL



Structure

- UK Natural Capital Accounting
- EO data management and opportunities
- Habitat condition

UK Natural capital accounting

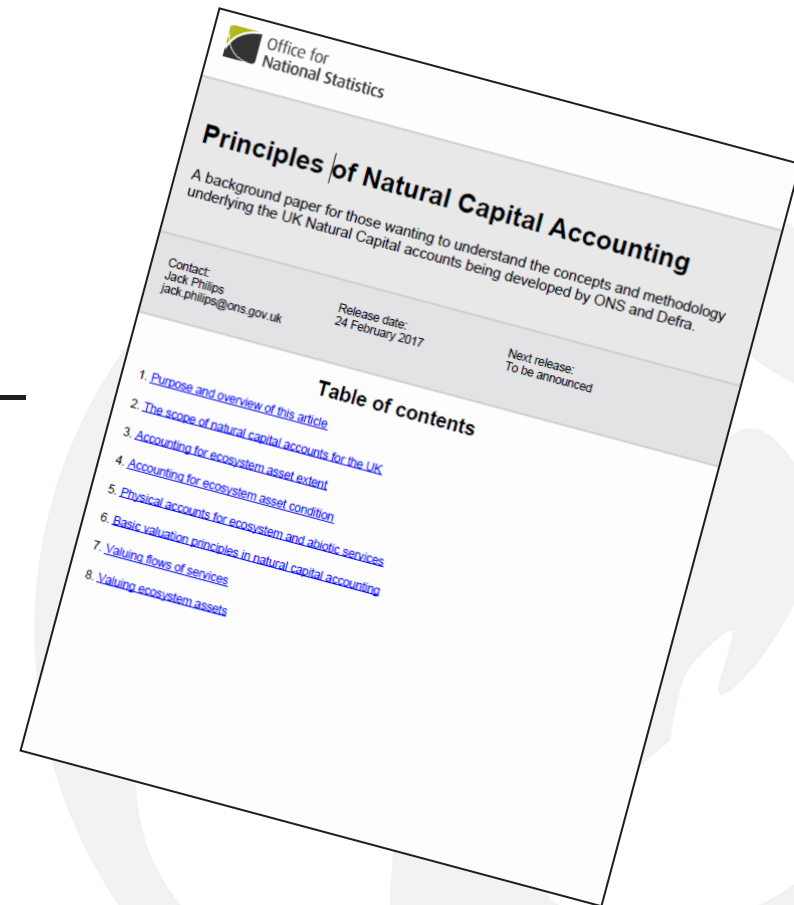
- UK is on track to complete a full set of natural capital accounts by 2020
 - ecosystem accounts of extent and condition;
 - accounts of non-monetary Ecosystem Service flows;
 - monetary accounts placing values on those flows;
 - asset accounts showing the NPV of the expected future services
- This is part of a wider move towards the compilation of natural capital accounts in the UK, at national, subnational and corporate level
- Scotland's Natural Capital Asset Index
- Well being of future generations indicators in Wales

UK Pioneer projects

- NC Accounting in the UK is strongly supported by the Natural Capital Committee, which advises the UK Government on the state of natural capital in England.
- They have been instrumental in establishing four 'Pioneer' areas where the usefulness of NC and NCA approaches will be assessed
 - A catchment
 - A landscape based approach
 - An urban environment
 - A marine environment

ONS-Defra accounting principles

- ✓ Basis for consistent methodology in developing accounts
- ✓ Adapts and translates SEEA guidance for our purpose
- ✓ Institutionalises “learning by doing” – a virtuous circle
- ✓ Identifies issues needing further research and testing
- ✓ Much of the guidance relevant for accounting at sub-national level



Earth Observation and asset accounts

- **Extent** of land cover types:
 - Linear features e.g. hedges, ditches, coastal habitats
 - Wetlands, urban habitats
 - Types of woodland
- Ecosystem **condition**
 - Tree health
 - Carbon biomass stocks
 - Marine litter?
- A key consideration will be reliable measures of change



Sentinel 2 – North Uist

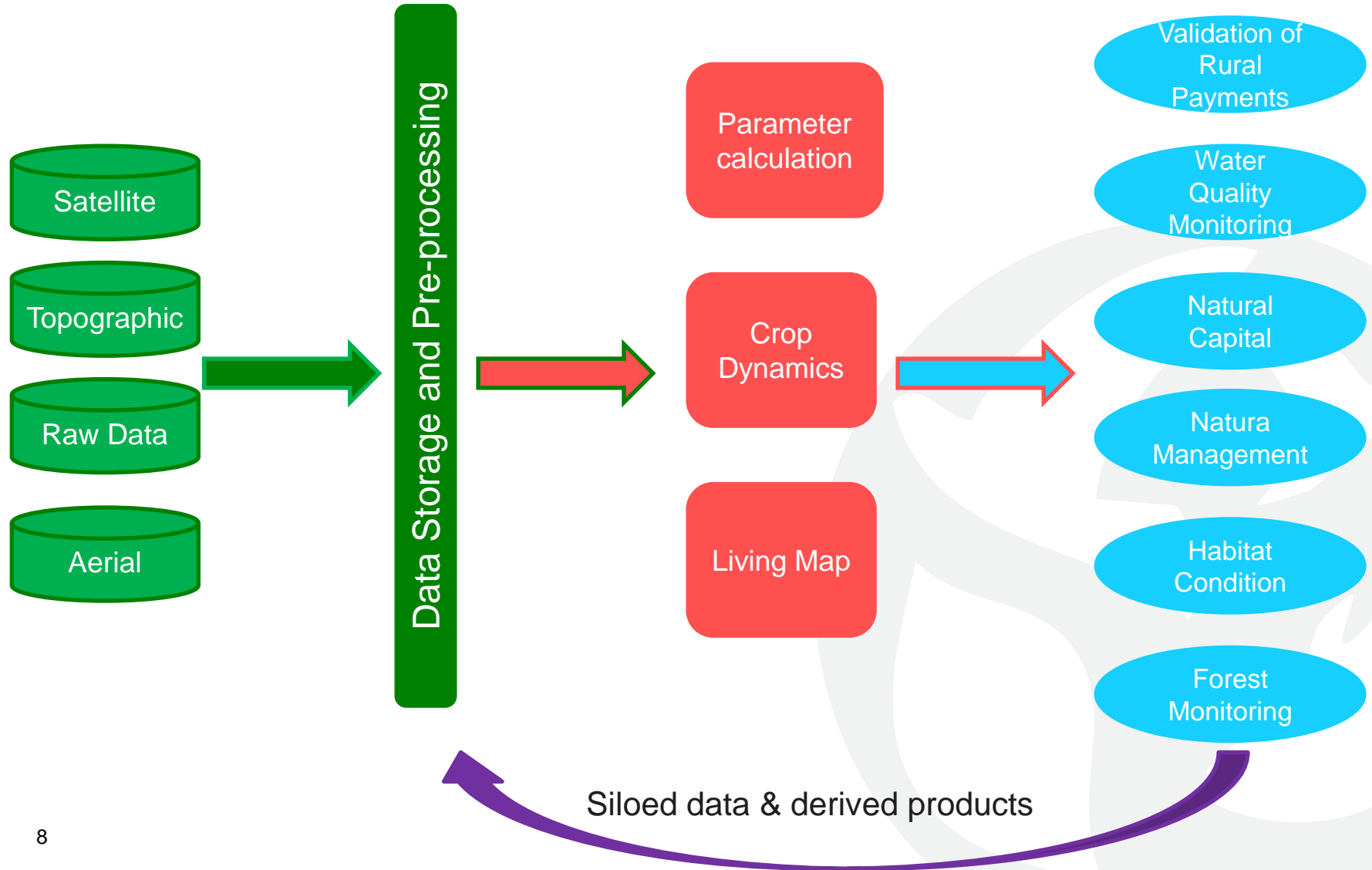


EO conceptual structure

Various Datasets

Collaboration Node

Intermediate Products



Collaboration platform

[Home](#)[About](#)[Contact](#)[Dropdown ▾](#)[Default](#)[Static top](#)[Fixed top](#)

EO Collaboration Platform

From 2016-06-01

To 2016-06-31

Area [-8,53,0,57]

[Update](#)

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capturedate 2 Jun 2016 orbit 80 row 4		
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8 products selected

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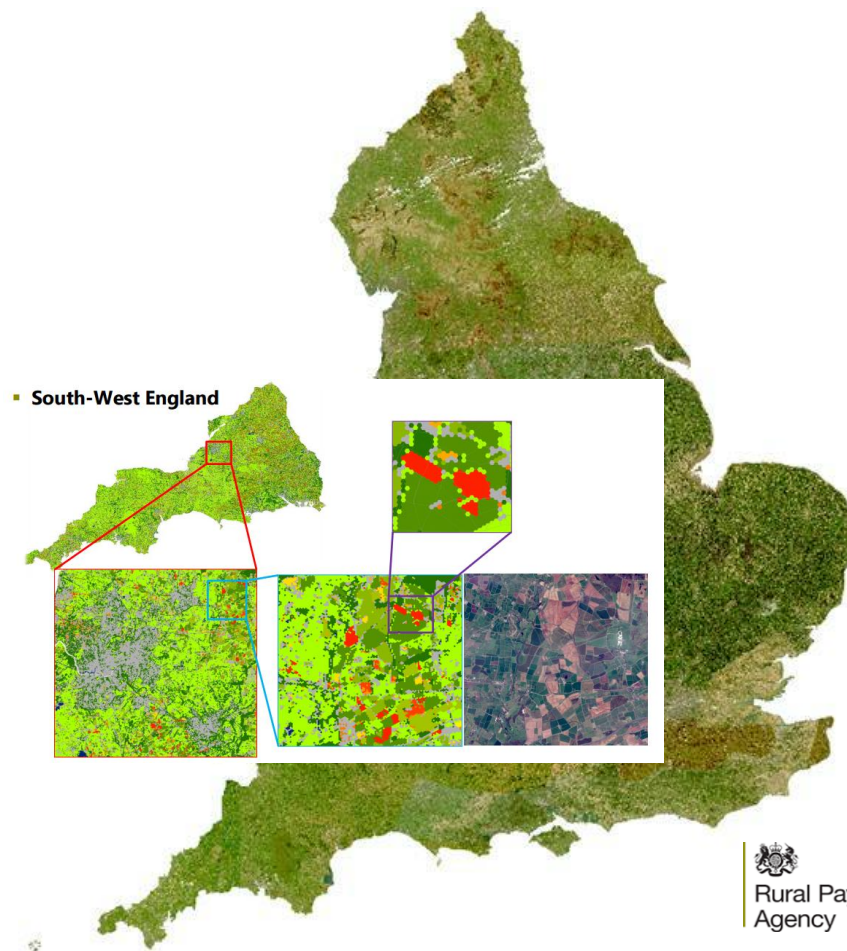
4 Reminder(s)

JNCC Applications

08:07
27/03/2017

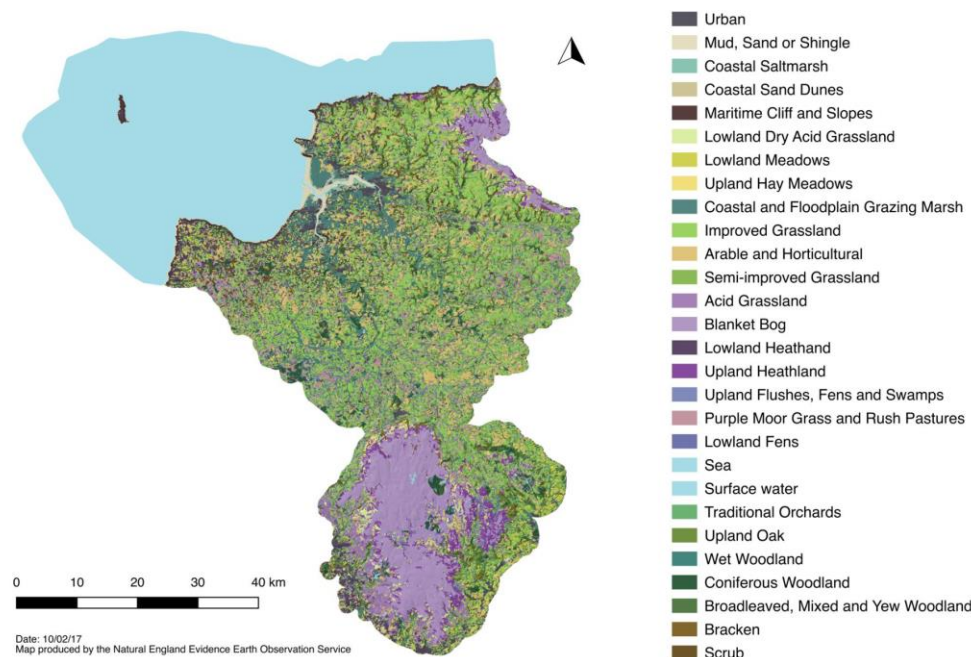
Crop Map of England layer (CROME layer)

- RPA, using methods delivered by EODIP research, are now generating an annual England wide crop classification. 2016 has been produced, preparation for 2017 underway
 - Summer and Autumn versions
 - Covers Main crop types with high accuracies
- Derived from Sentinel 1 radar data and inspection data for training the classification. Uses Sentinel 2 for verification.
- Primary application is in validating Rural payments but has emerging important further applications
 - Shared with Natural England where it has contributed to Living Map generation
 - Shared with Environment Agency where it is a key input into developing a risk based method for determining diffuse pollution risk and for targeting water quality monitoring.
 - RPA are generating a 2015 map for EA to provide crop time series data for the risk based method.
- For the 2016 map, RPA secured sentinel 1 data and pre-processed it locally. For 2015 and 17 maps, RPA have been able to avoid both these time costly steps, using analysis ready data Sentinel 1 and 2 data produced by JNCC for the EOCoE



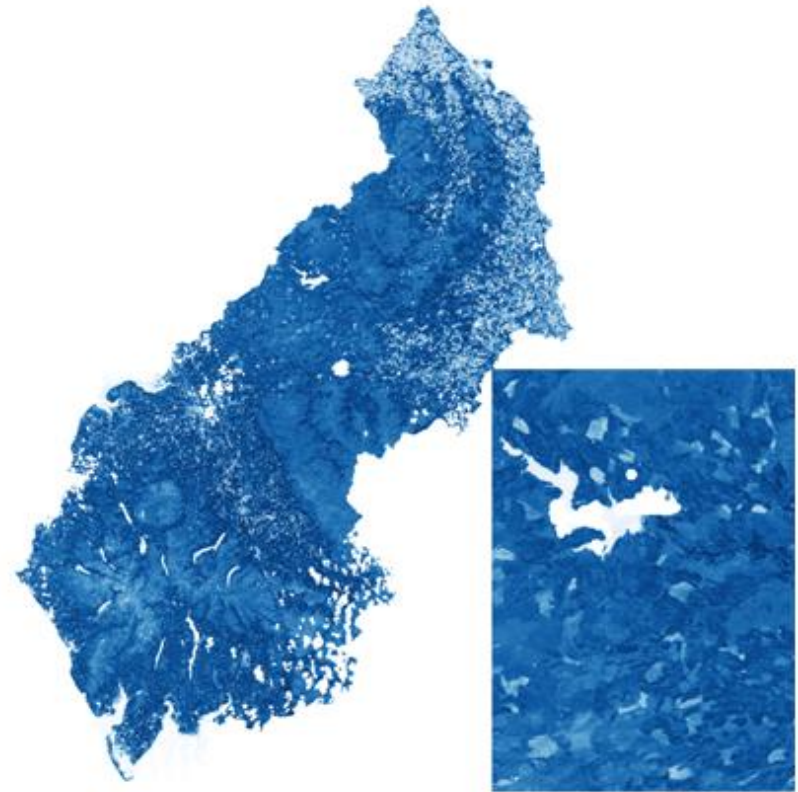
Natural Environment & Natural Capital – Living Map

- 2015/16 Natural England revised and adapted living map habitat mapping methods to support management planning for key upland protected sites, gaining landowner support for map production based on initial results.
- 2016/17 Natural England have led research, with input from UCL, to improve the statistical robustness and automation of the mapping methods, reducing production costs.
- The mapping effort has been aligned with the needs of 25 year plan pioneer areas and initial maps delivered for the landscape pioneer.
- Given adequate field sample data, the methods can be rapidly deployed. The methods use the RPA EO crop map product in classification, and production time is reduced given the availability of sentinel analysis ready data from JNCC.



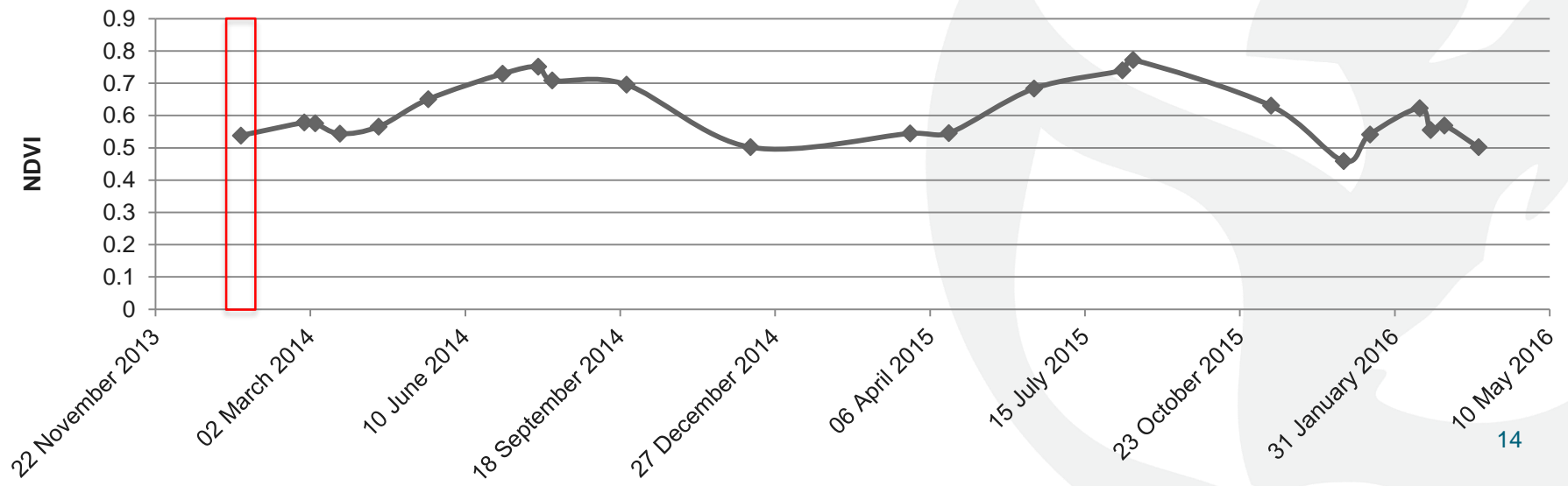
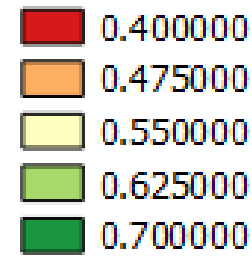
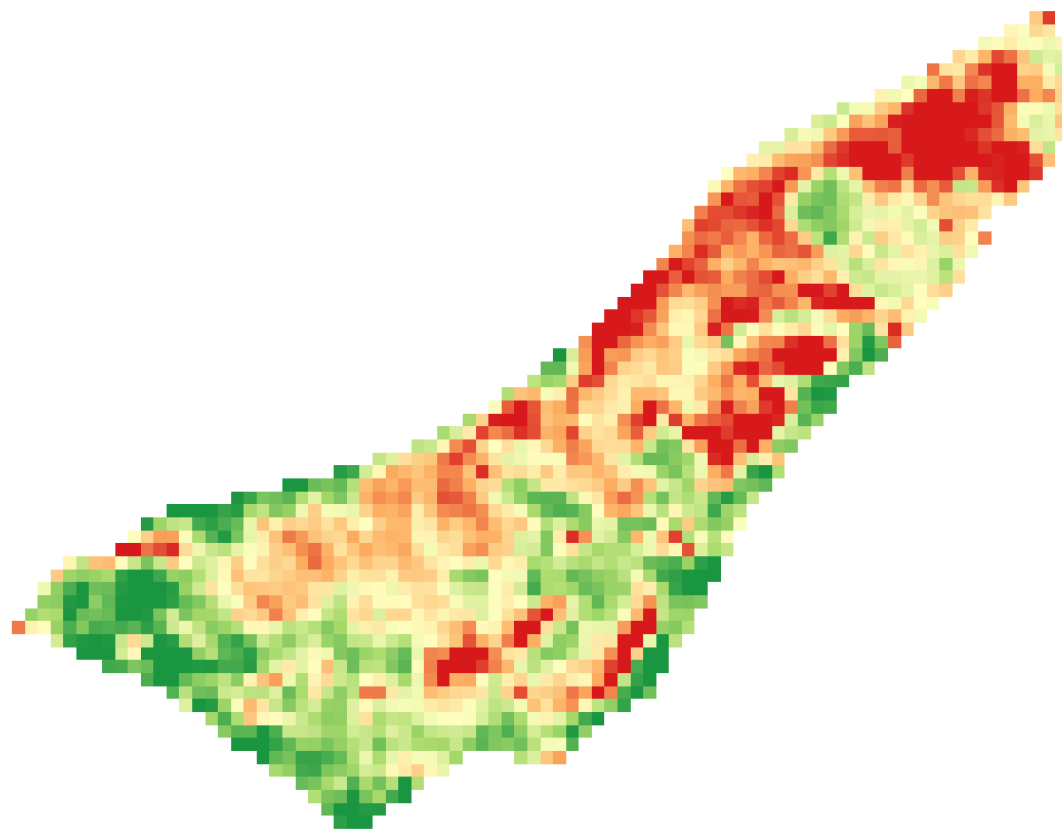
Intermediate Products from imagery

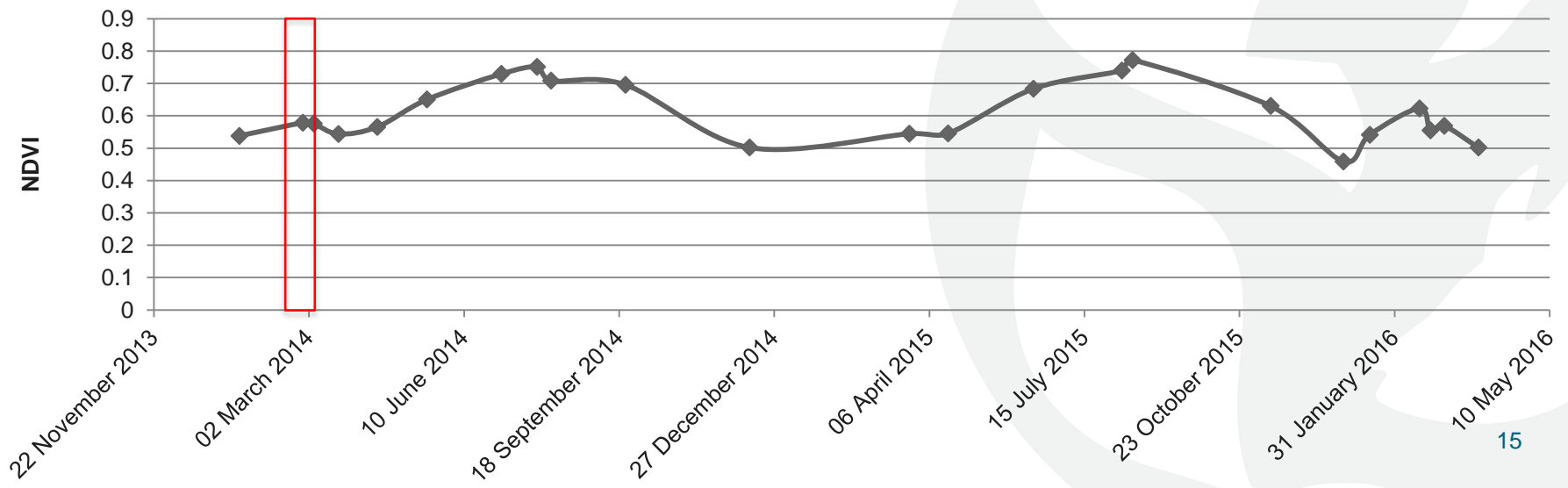
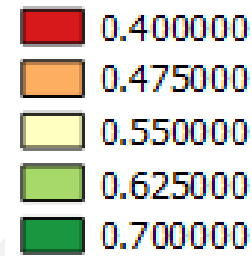
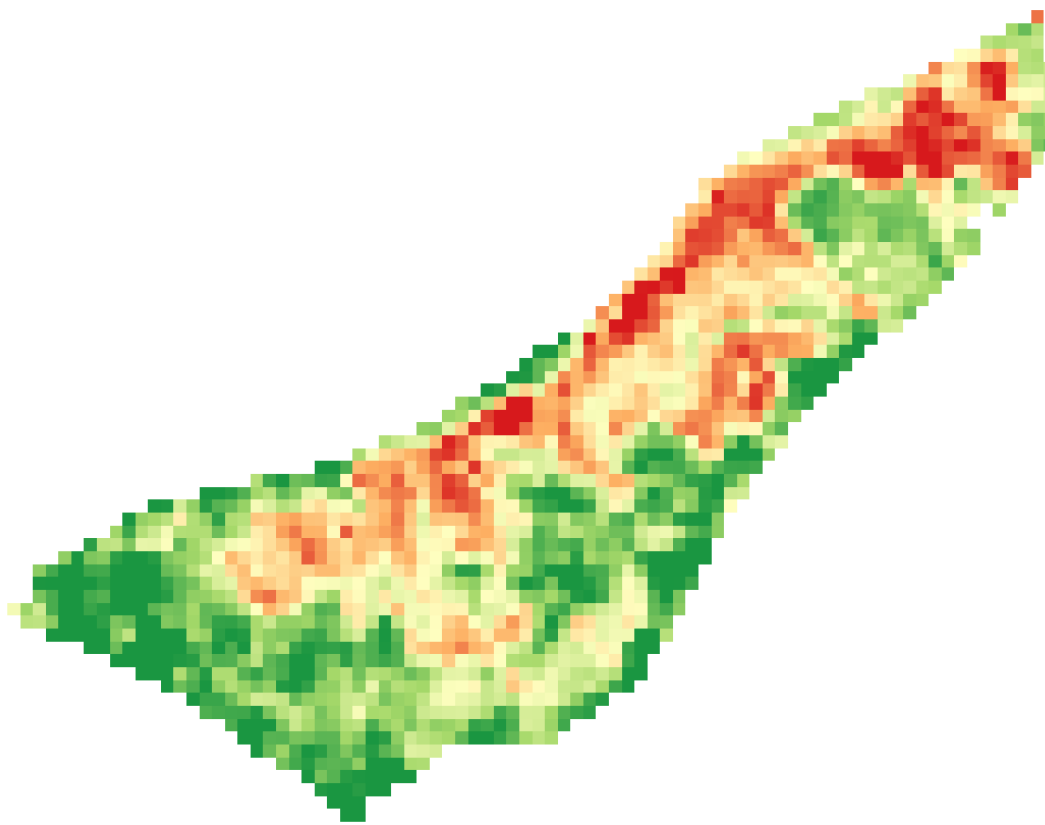
- Intermediate Products are data generated directly from imagery that provide useful information relating to what is happening on the ground. They are delivered as separate Geographic Information layers making them much easier for non-EO specialists to use.
- Being standardised products they can be used as parameters for a number of different applications. Therefore by producing them centrally we can reduce the duplication of each different application area generating them for their own processes.
- 2015/16 research demonstrated how production of these products can be automated for large areas.
- 2016/17 project is generating monthly composites, throughout the 2016 growing season, of two different parameters at a national scale. The work is also exploring what other parameters should and could be produced to meet demand from applications.
- Parameters being produced:
 - NDVI – Normalised Difference Vegetation Index which describes vegetation productivity
 - NDWI – Normalised Difference Water Index which describes moisture content in vegetation

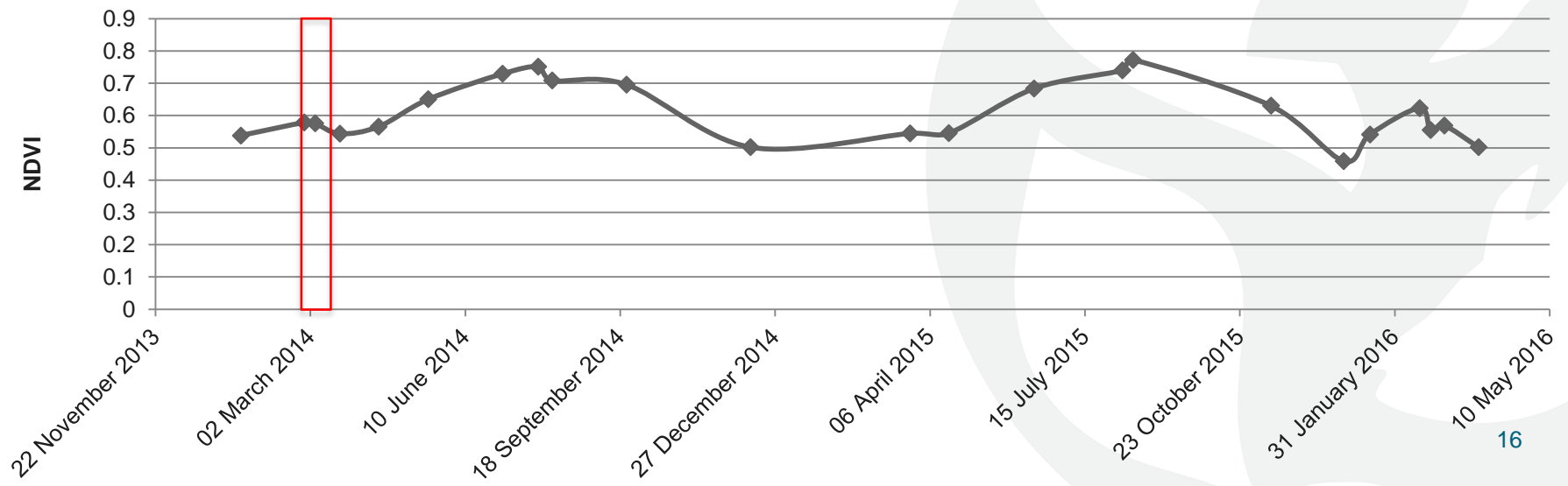
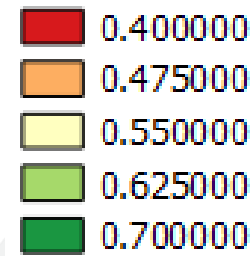
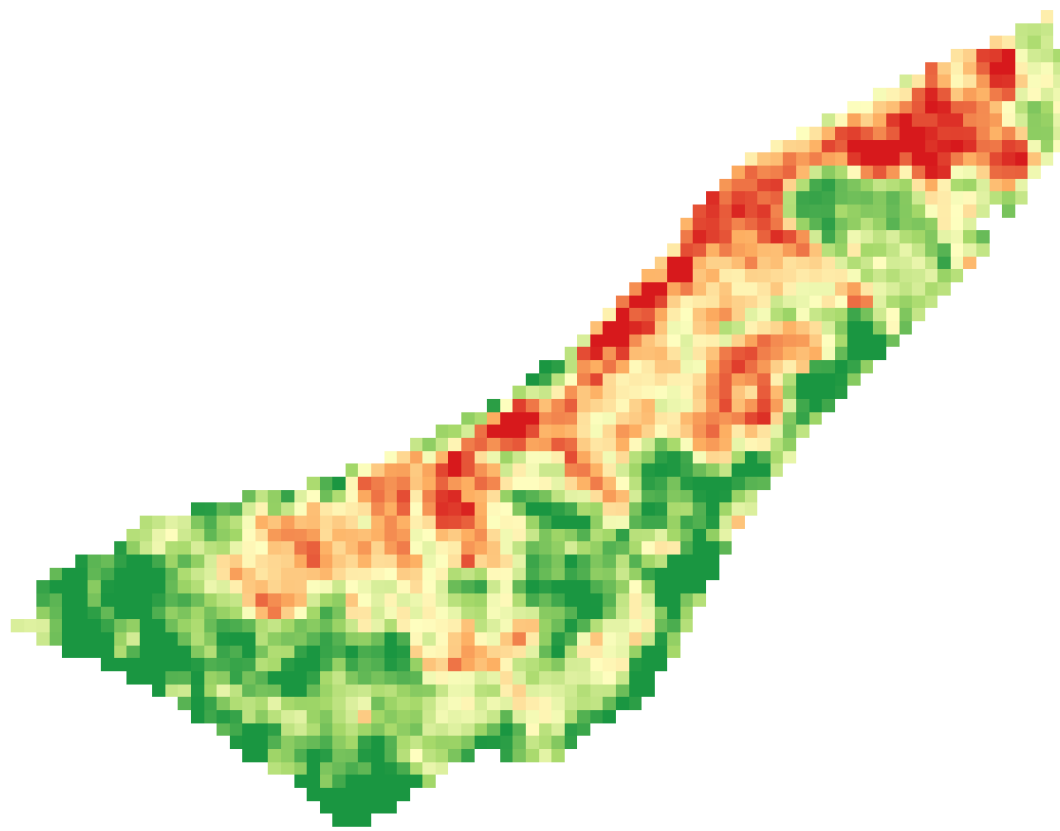


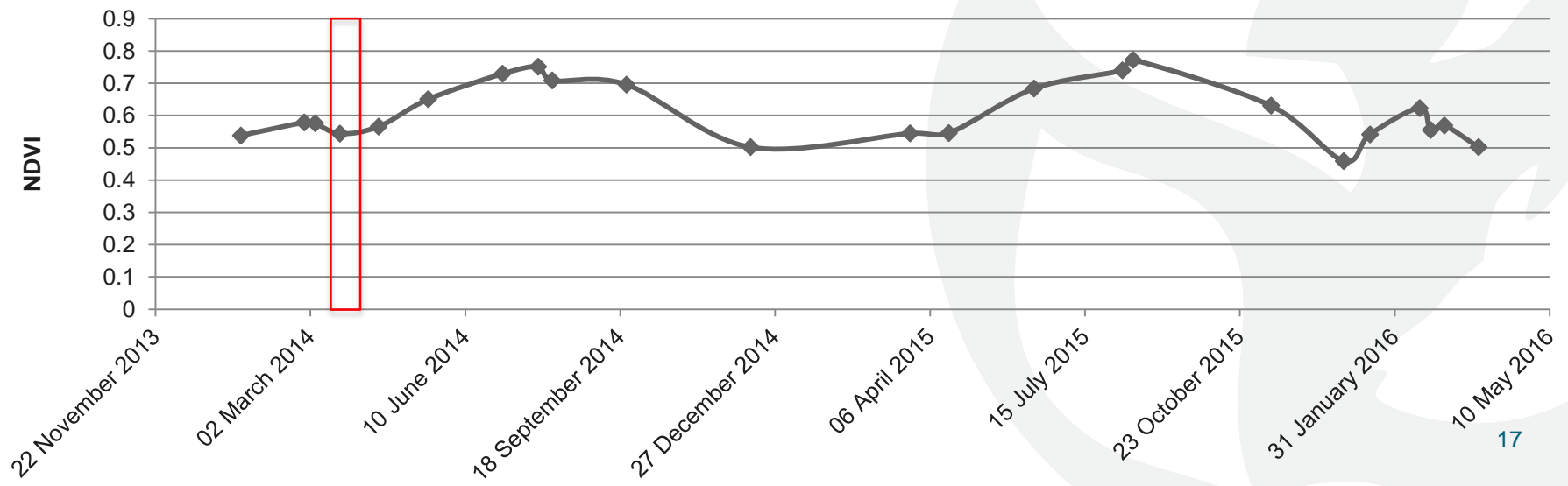
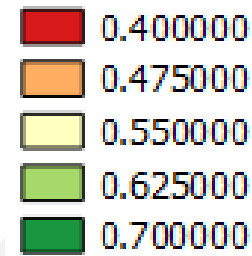
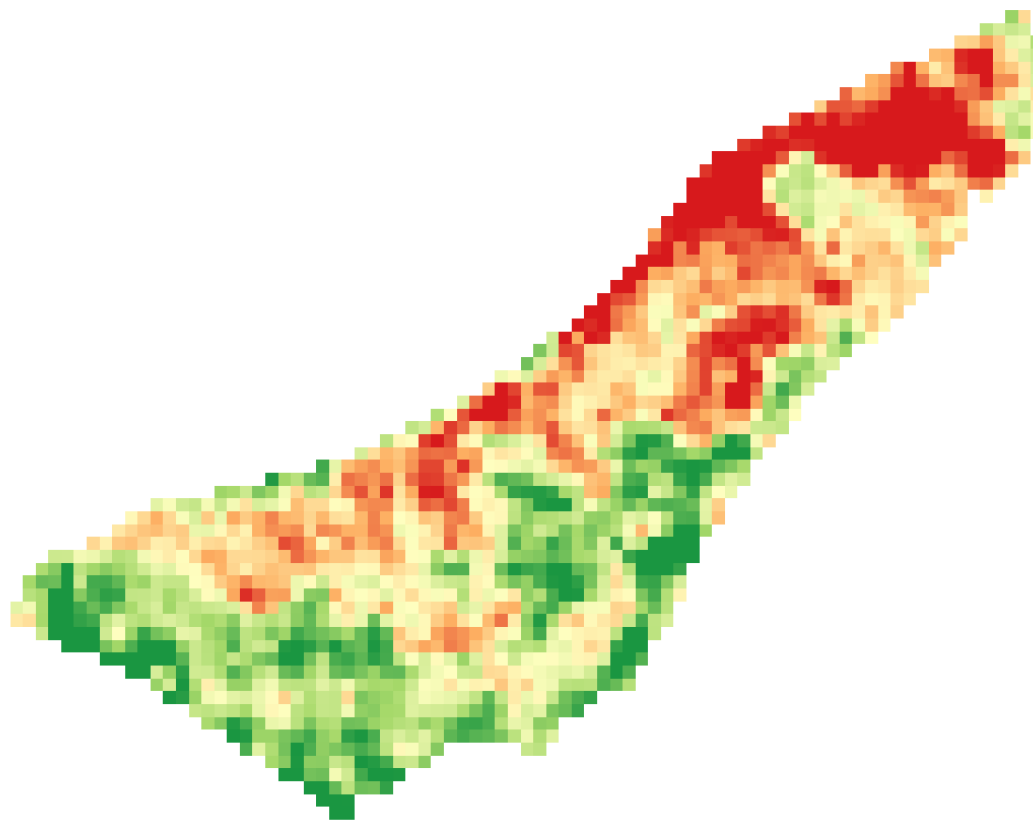
Normalised Difference Vegetation Index (NDVI) values across Cumbria and Northumberland. Inset: view of the detail around Kielder Water.

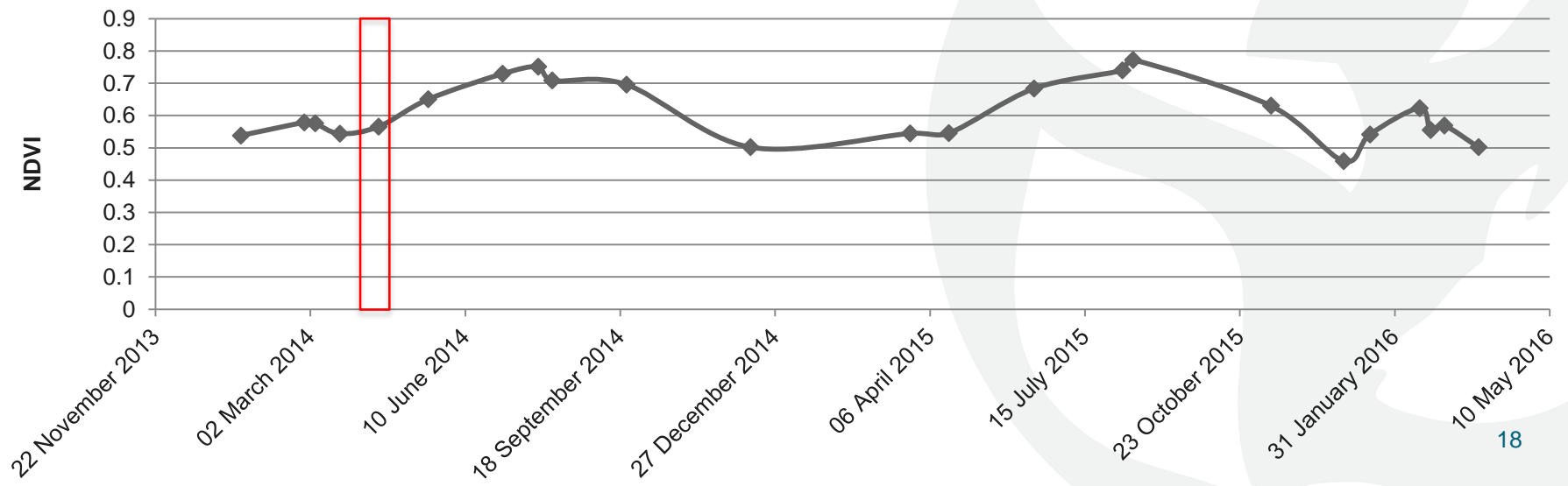
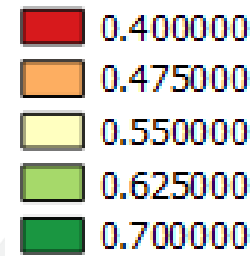
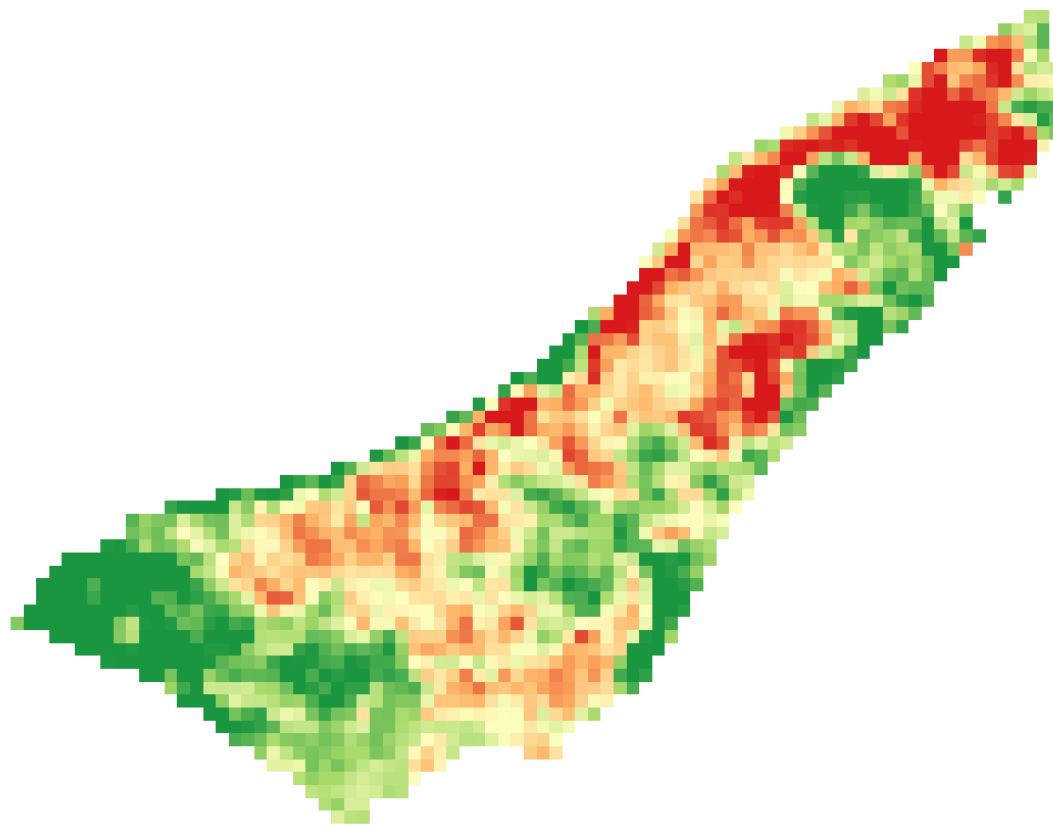
NDVI 2014 - PRESENT

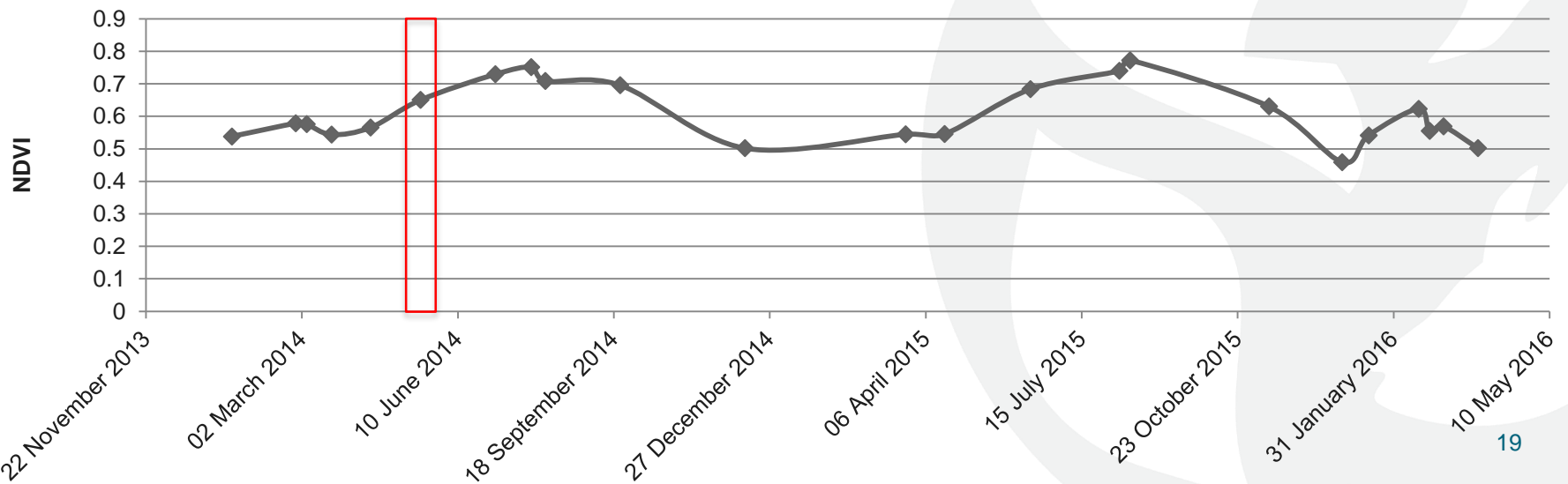
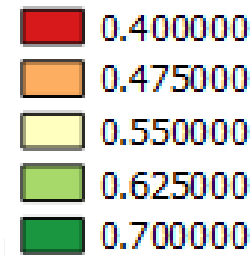
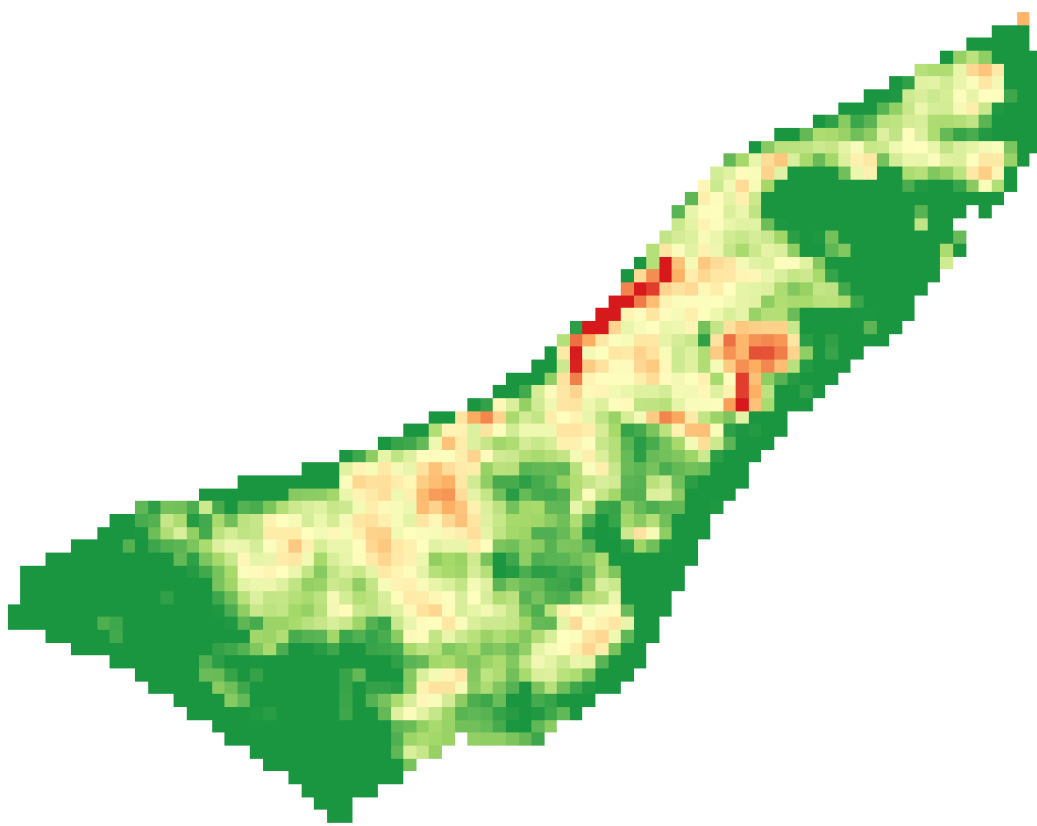


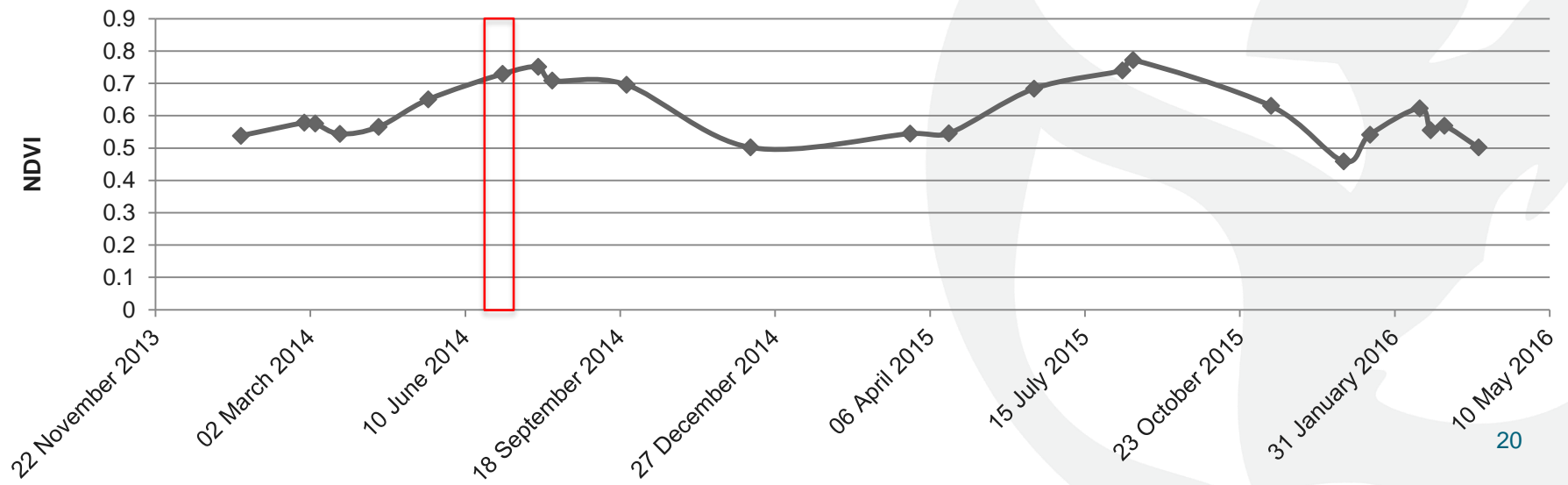
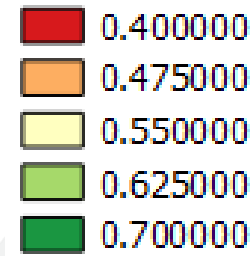
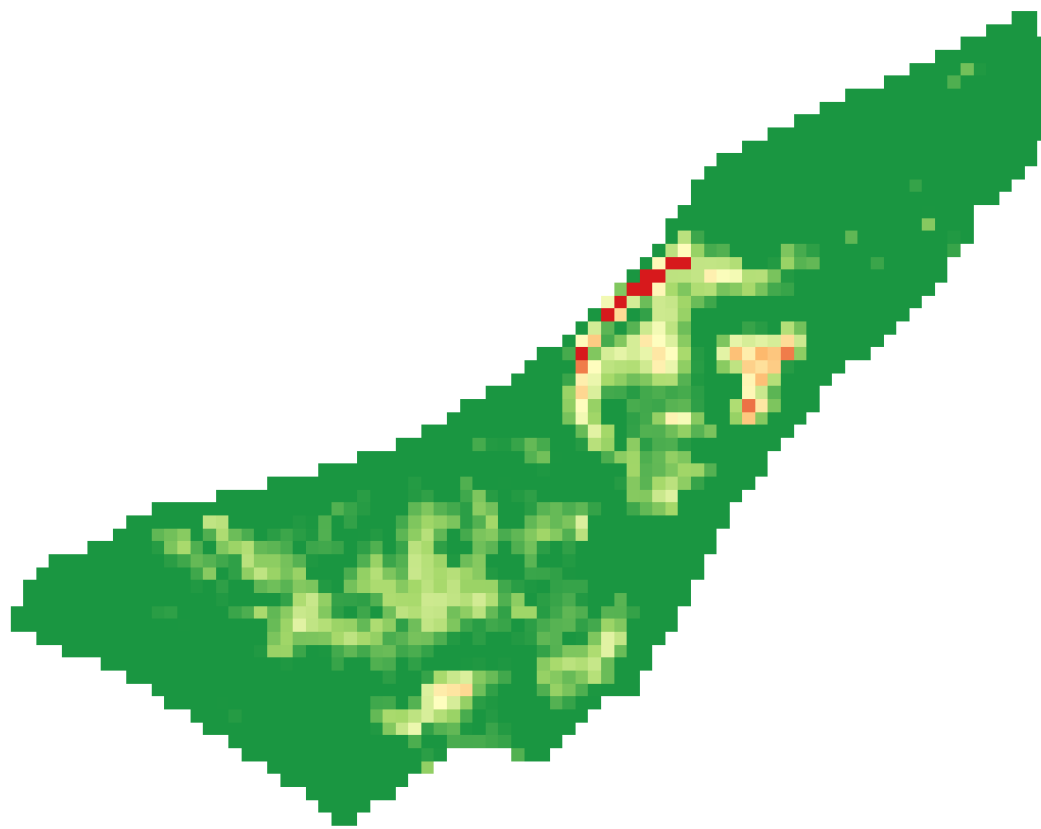


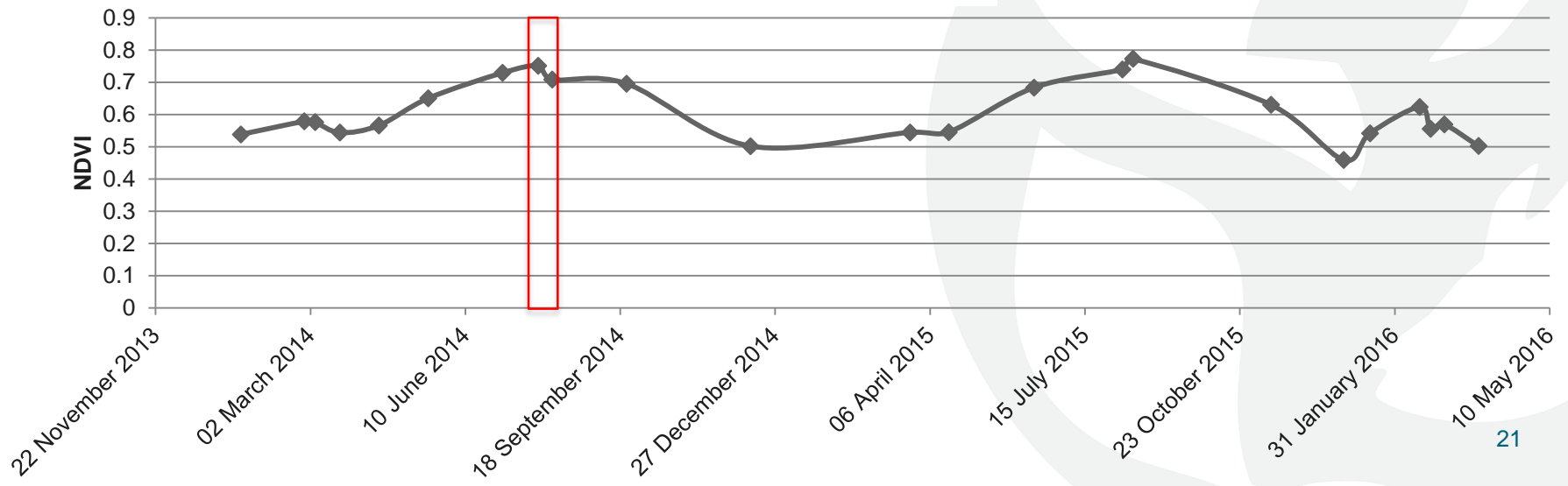
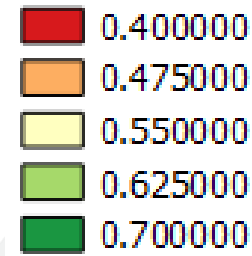
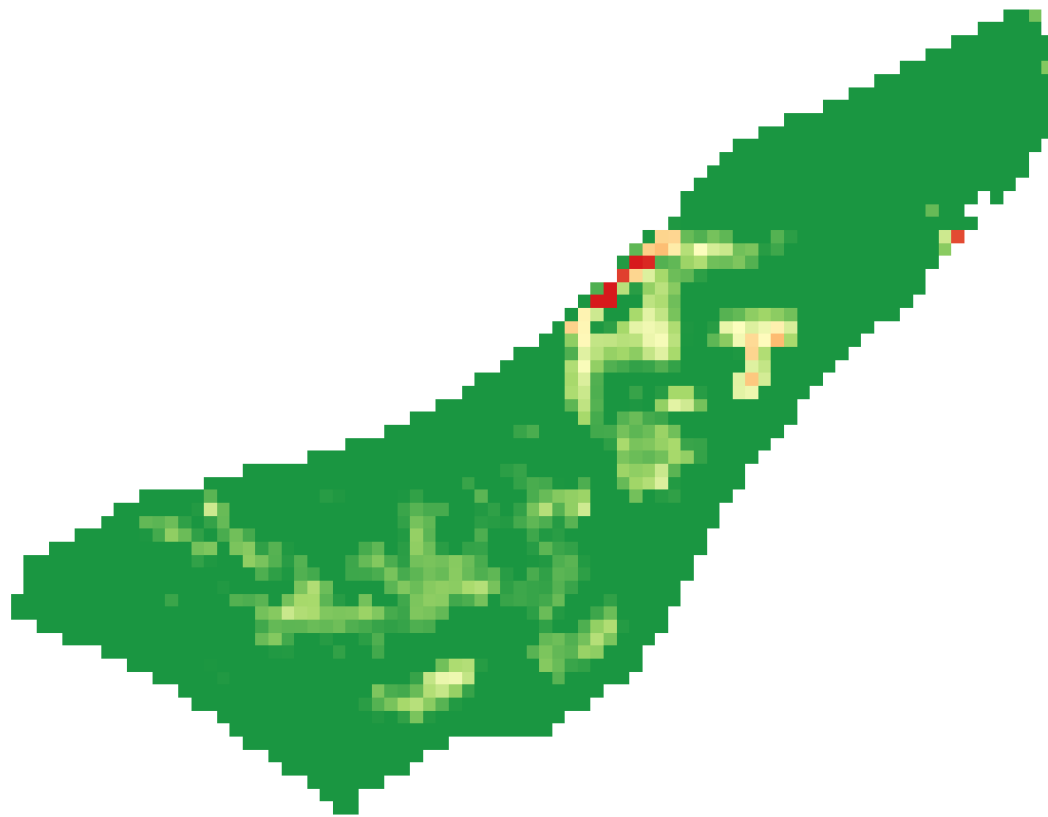


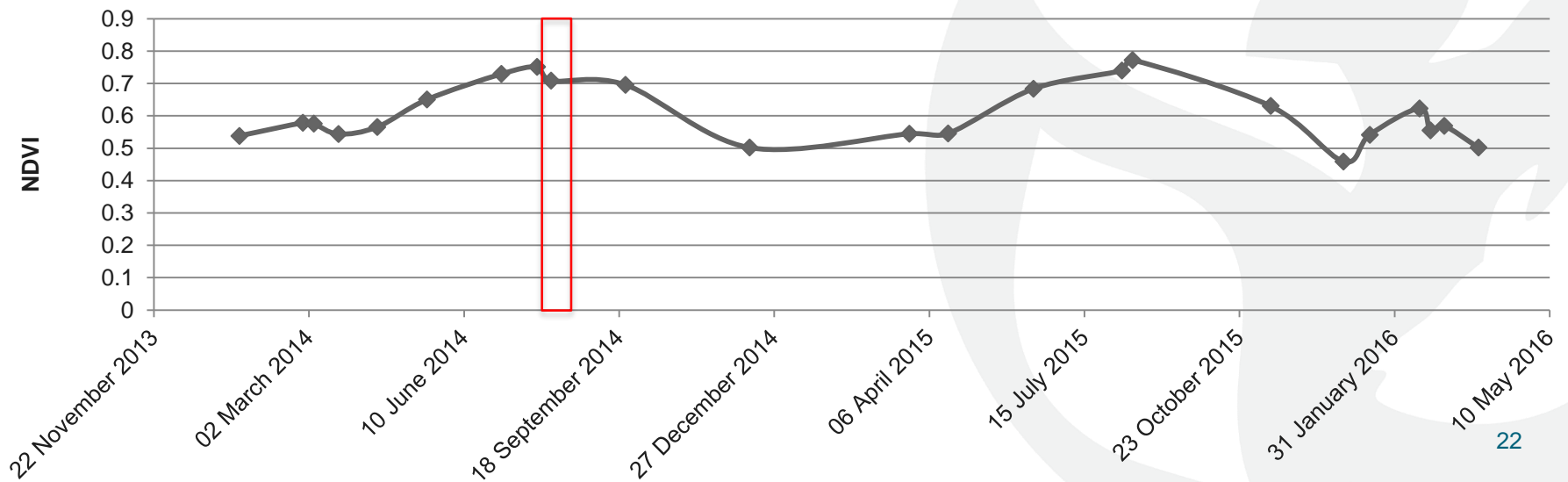
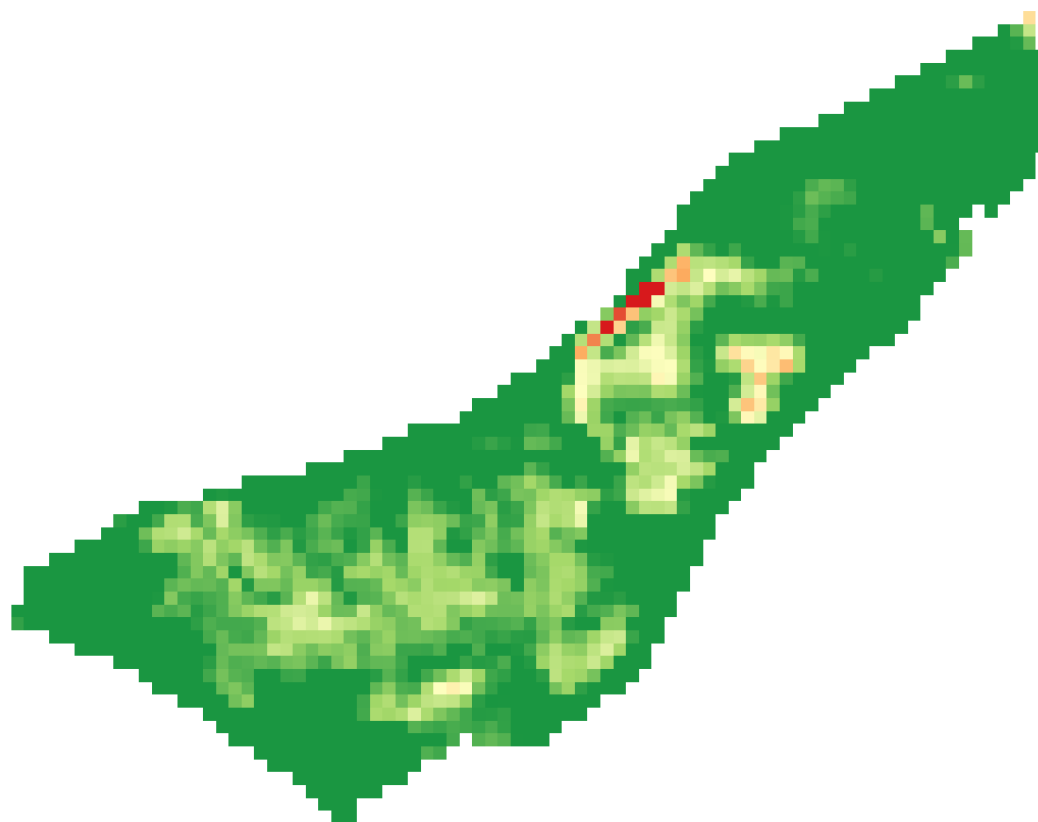


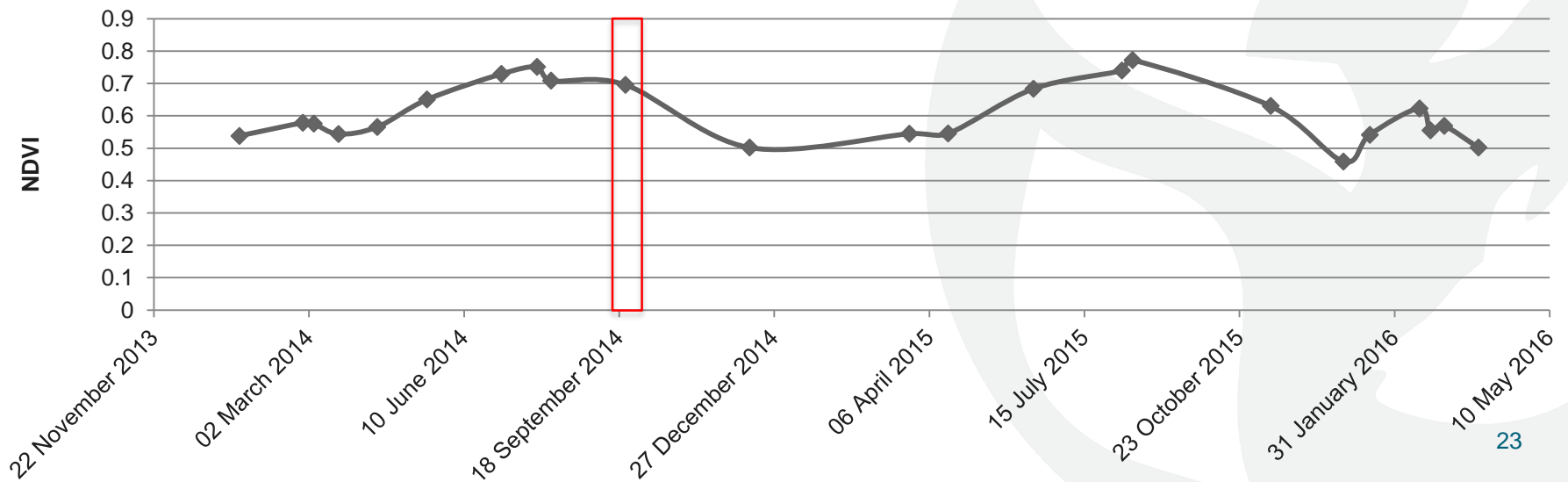
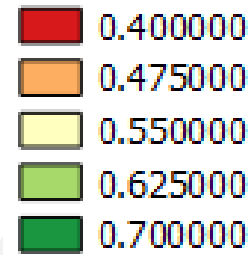
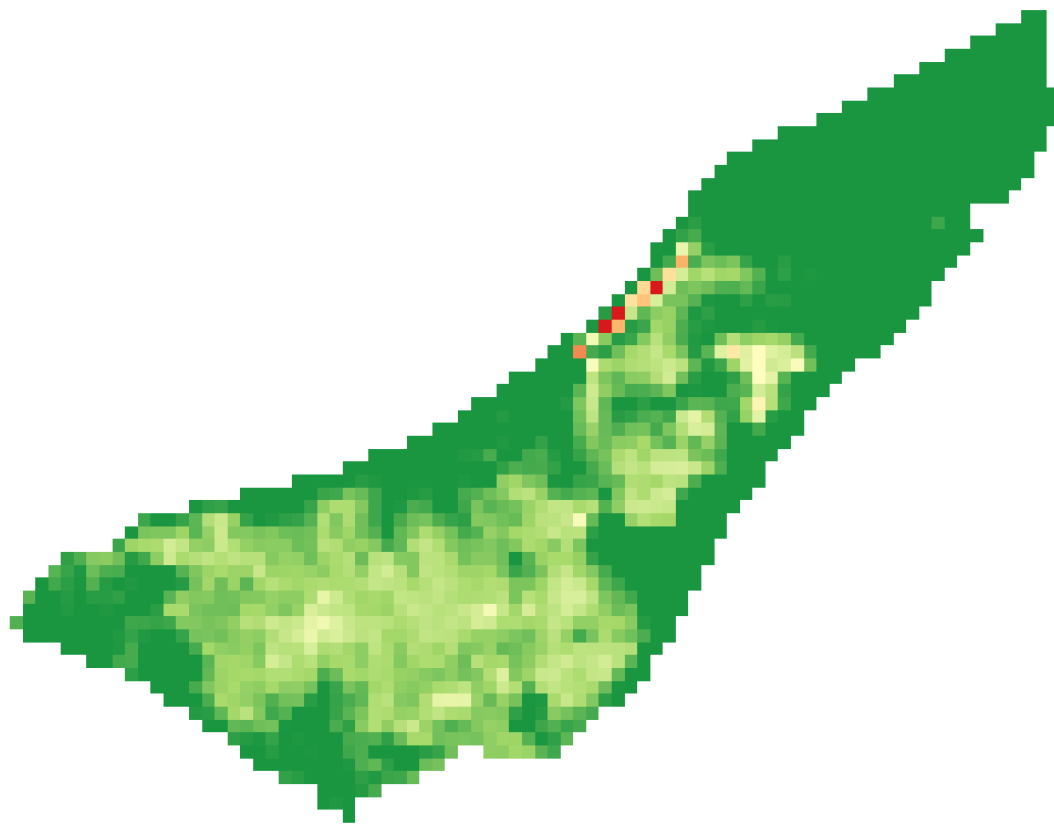


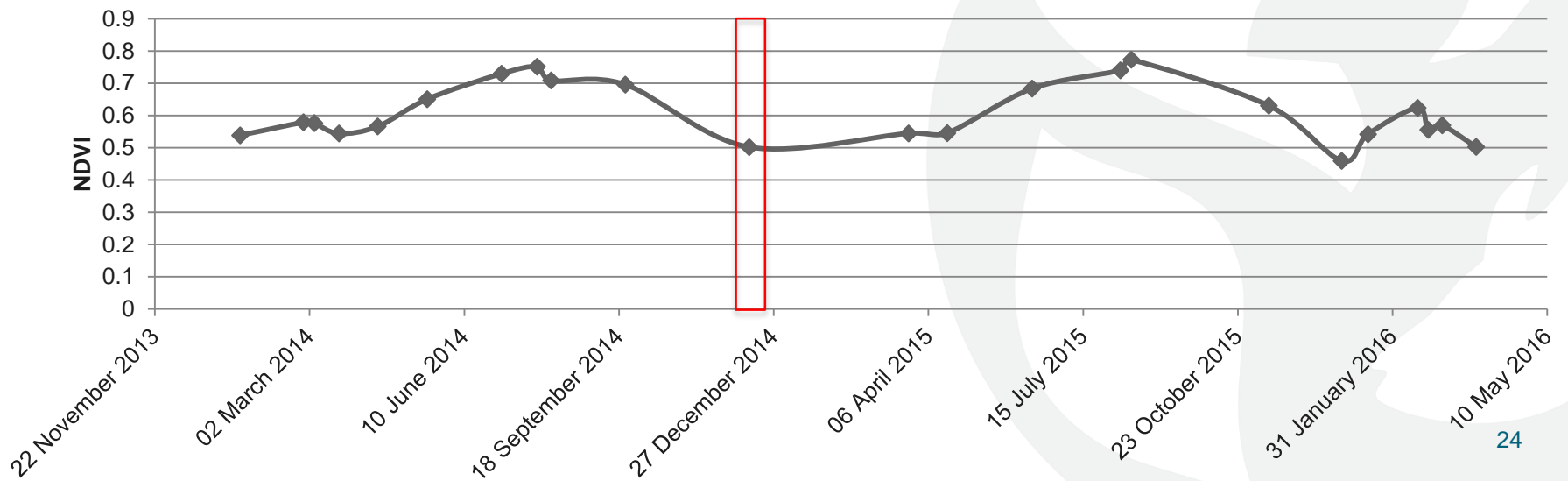
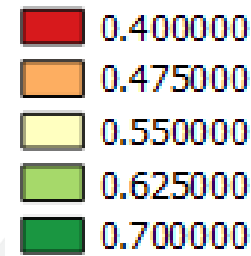
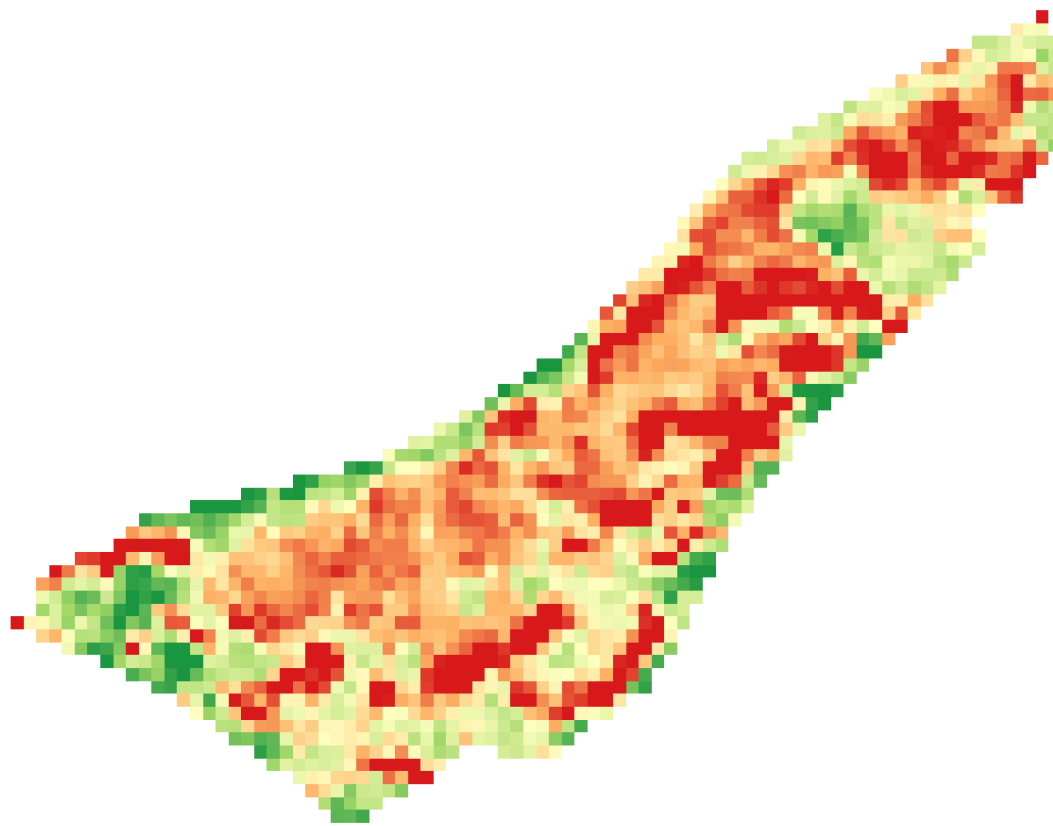


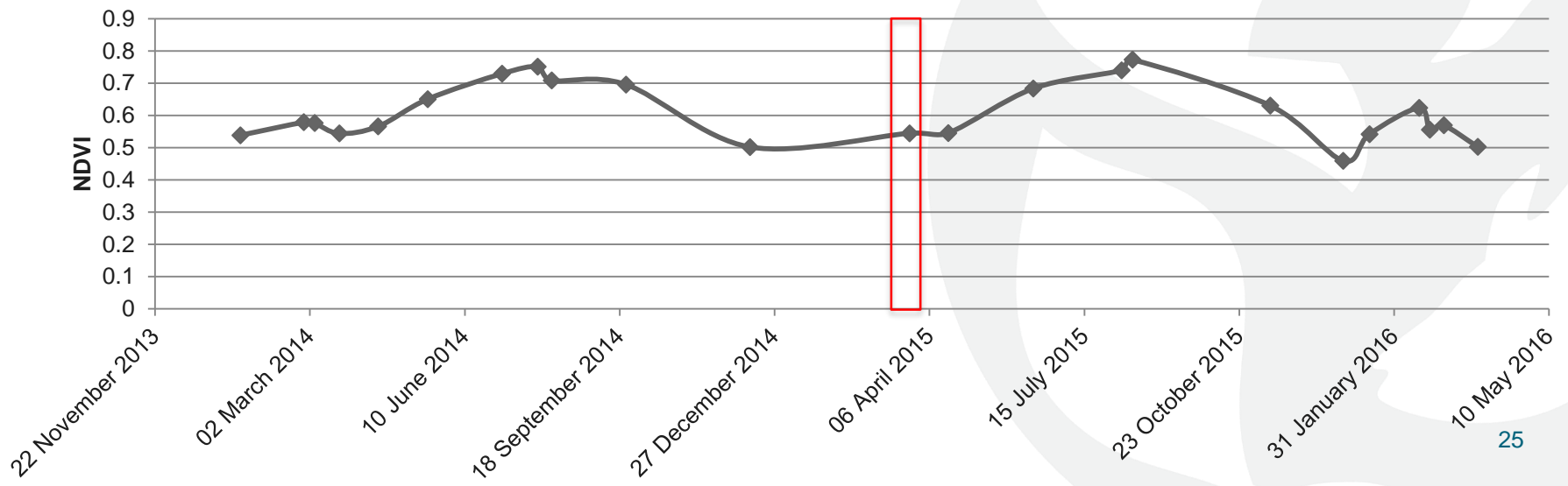
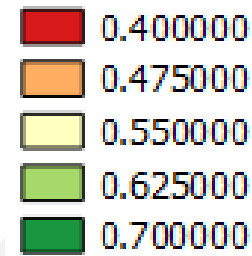
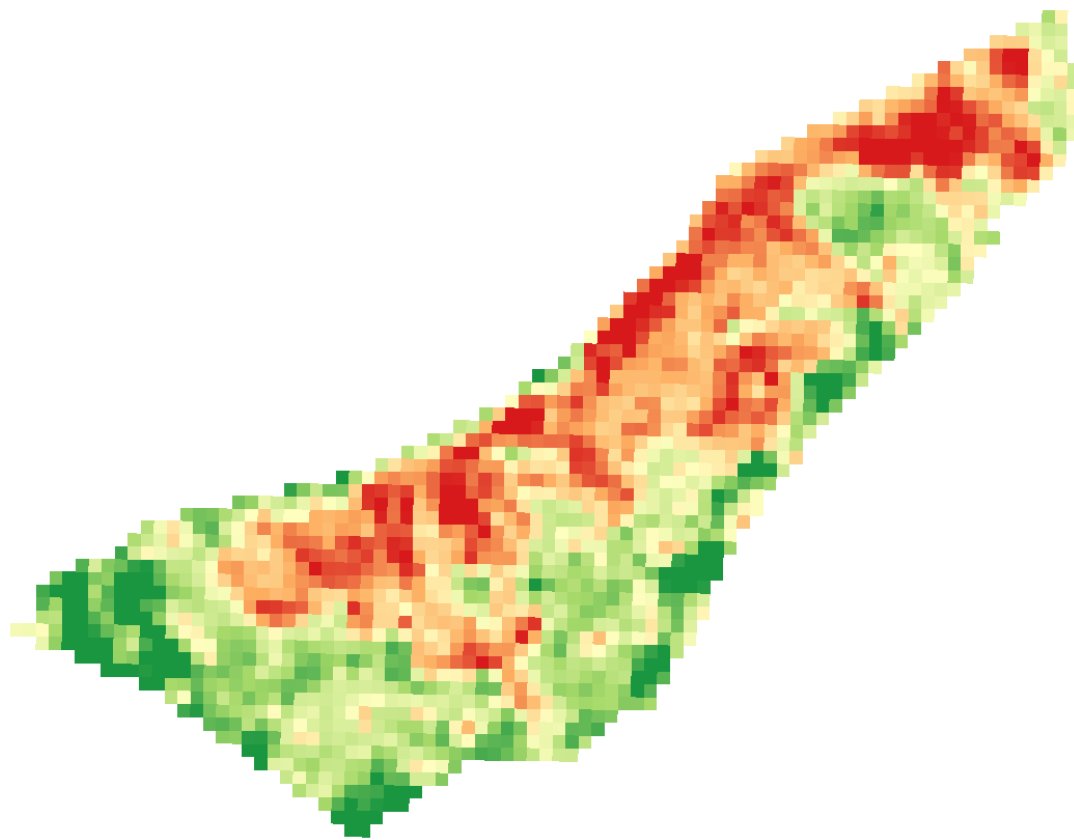


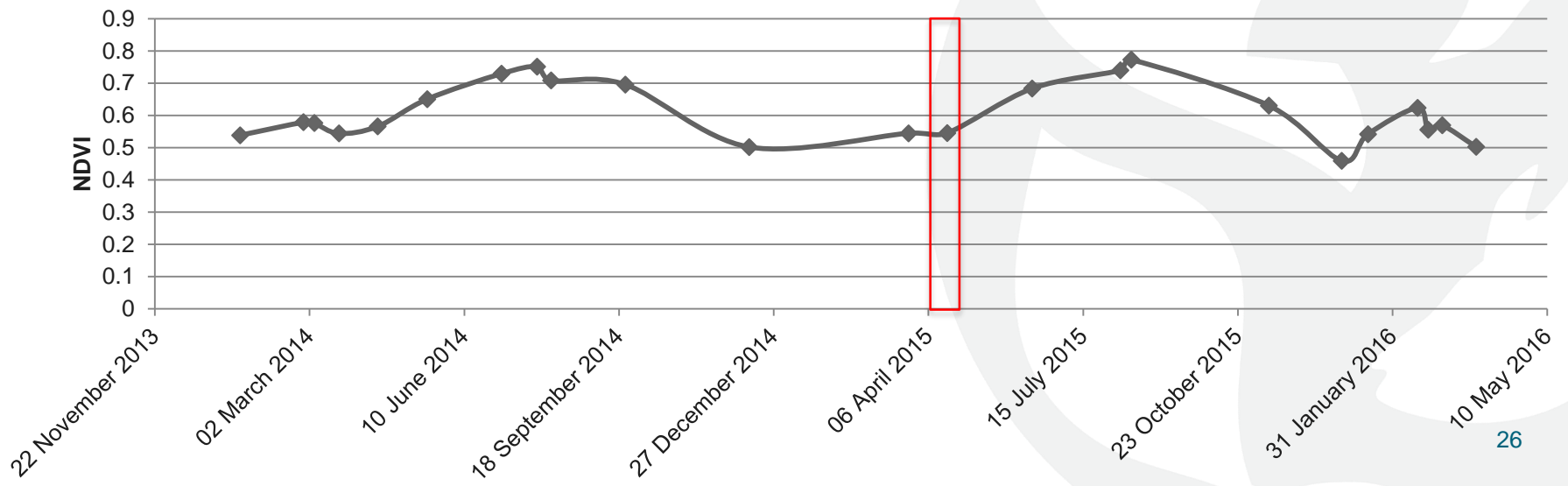
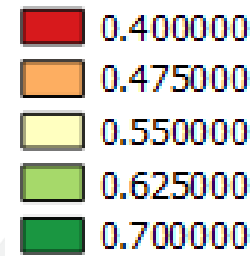
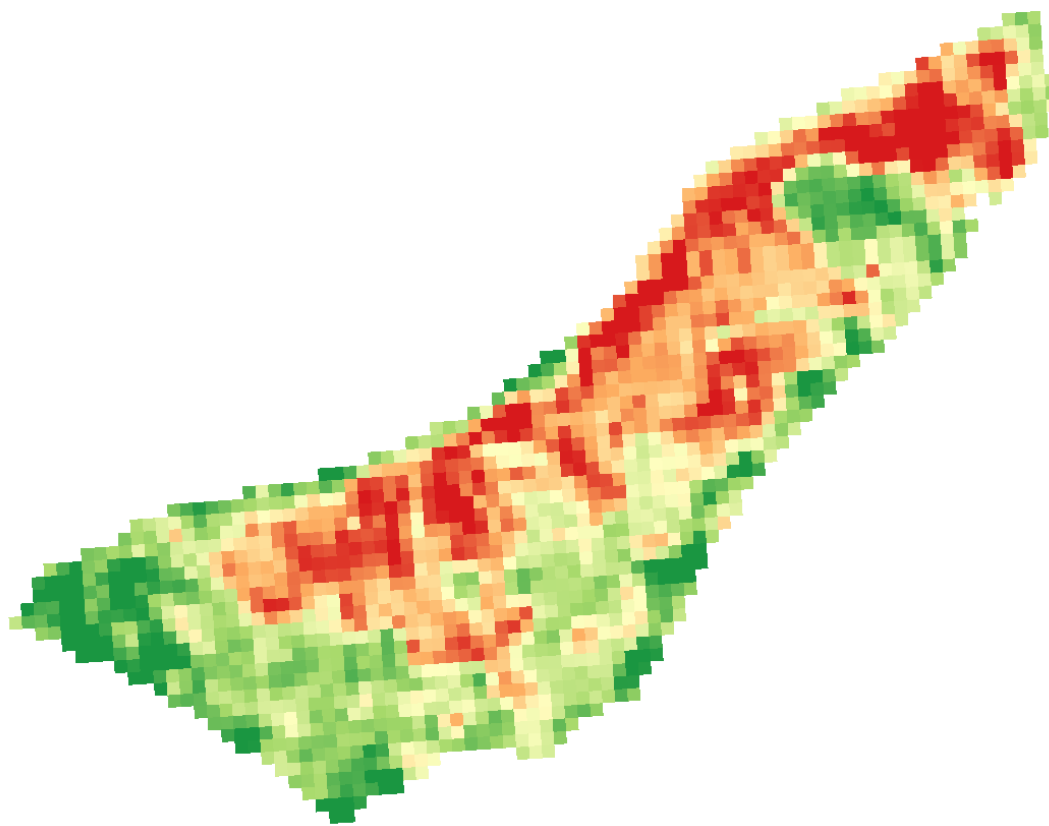


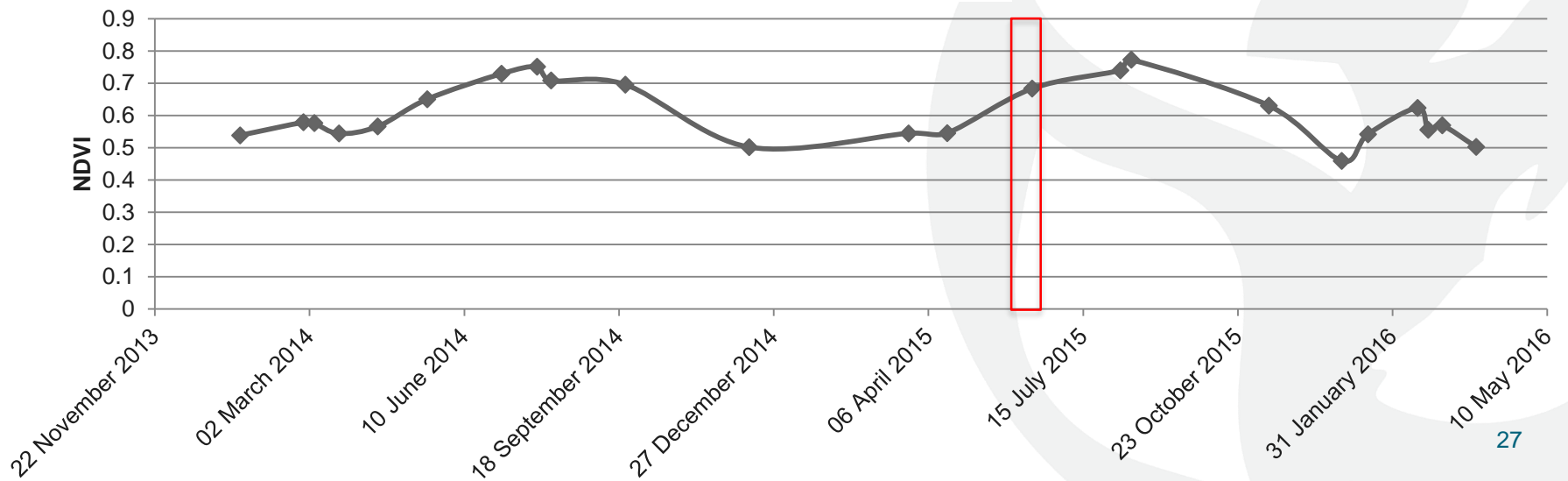
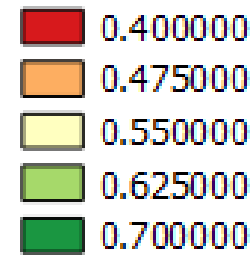
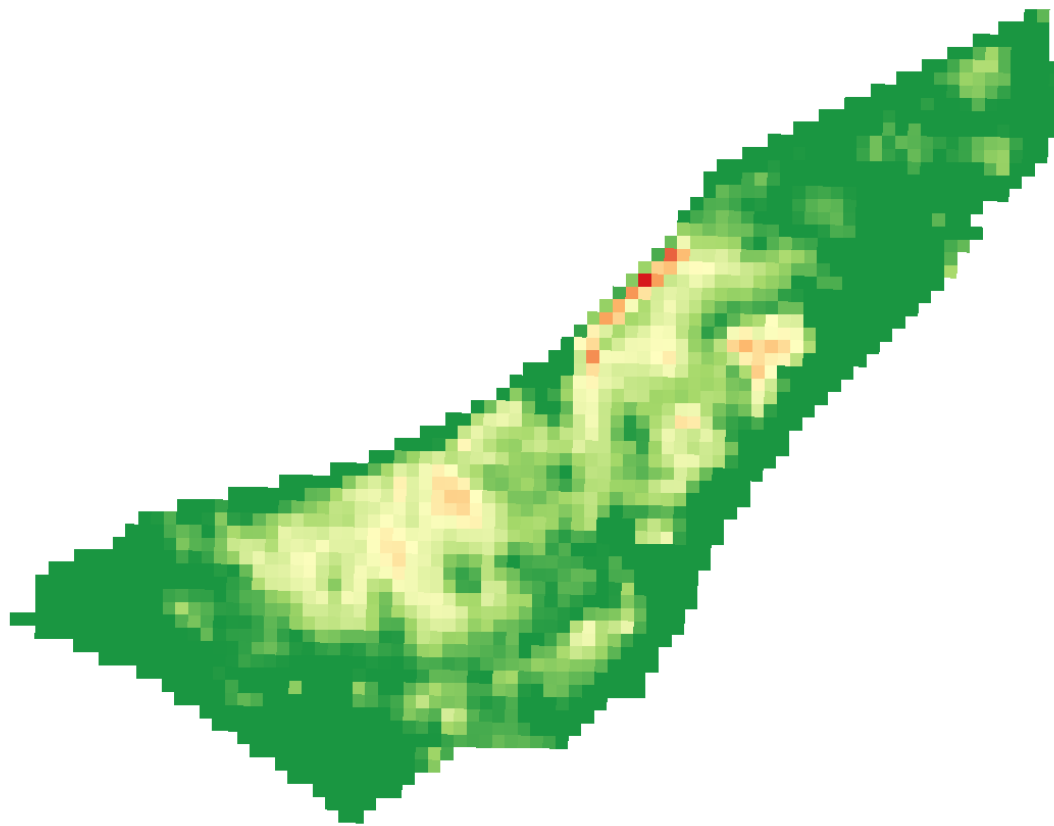


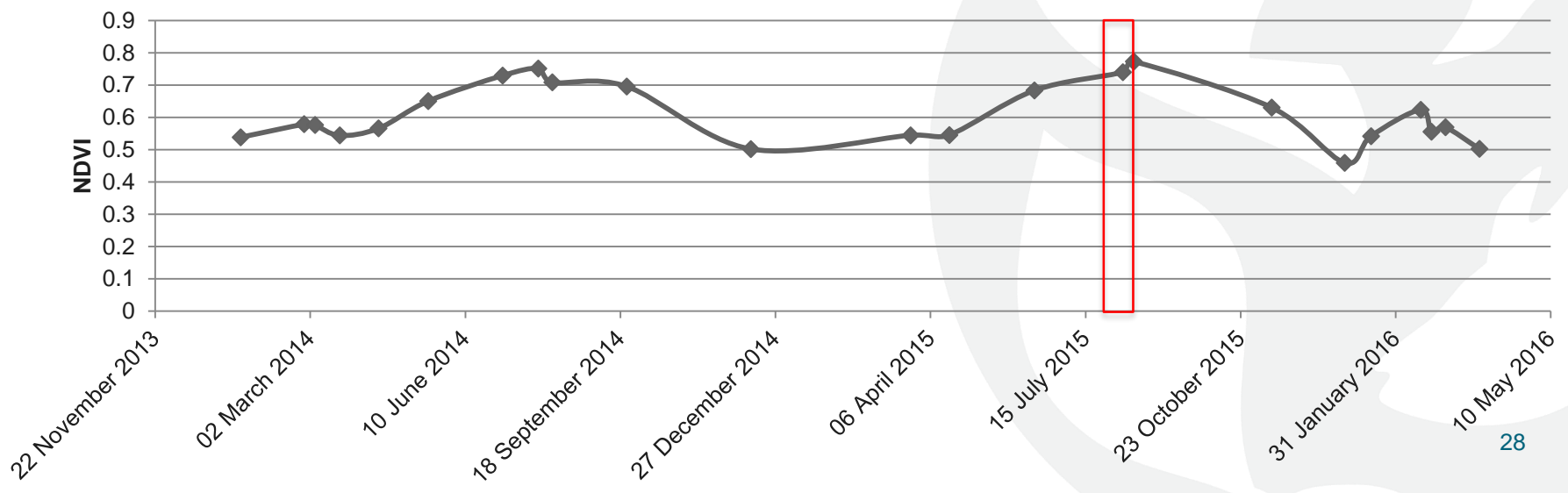
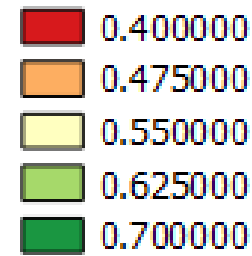


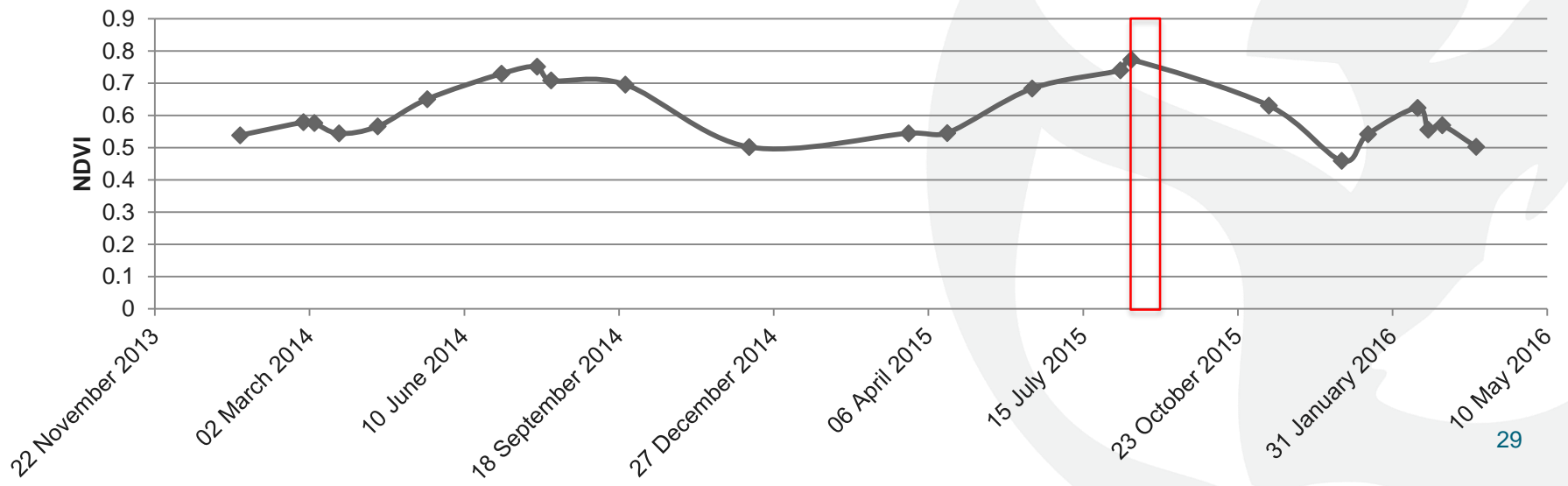
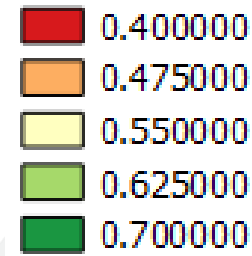
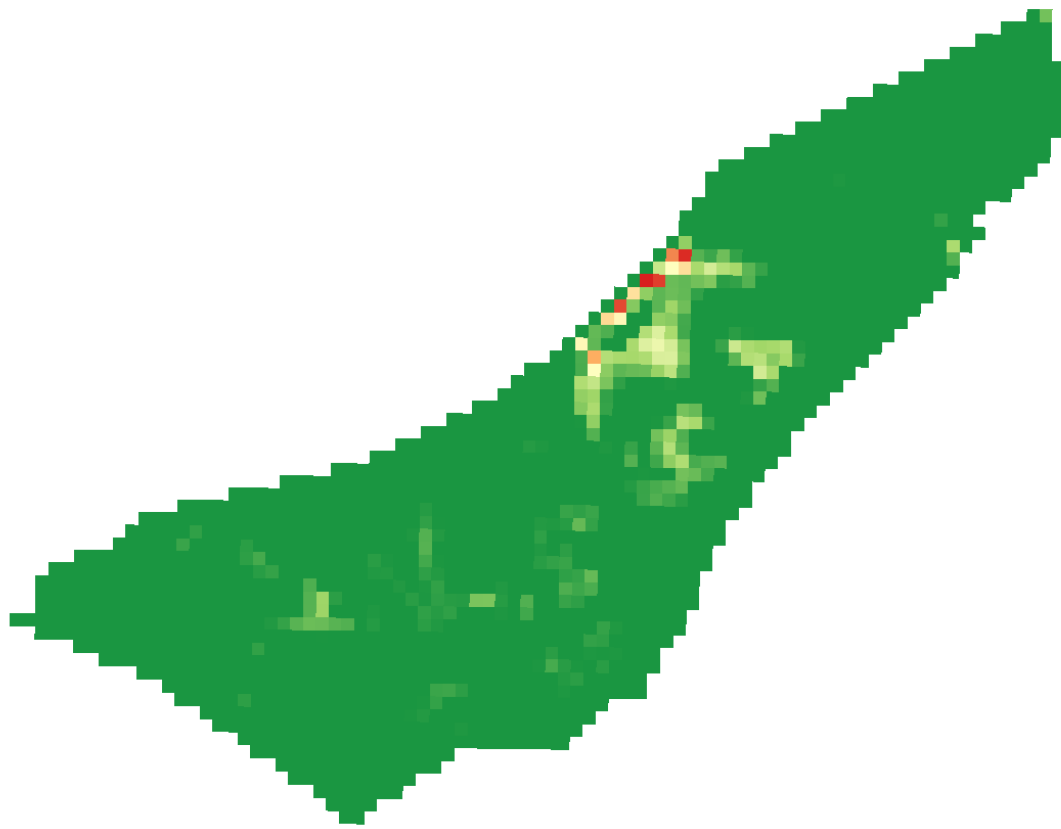


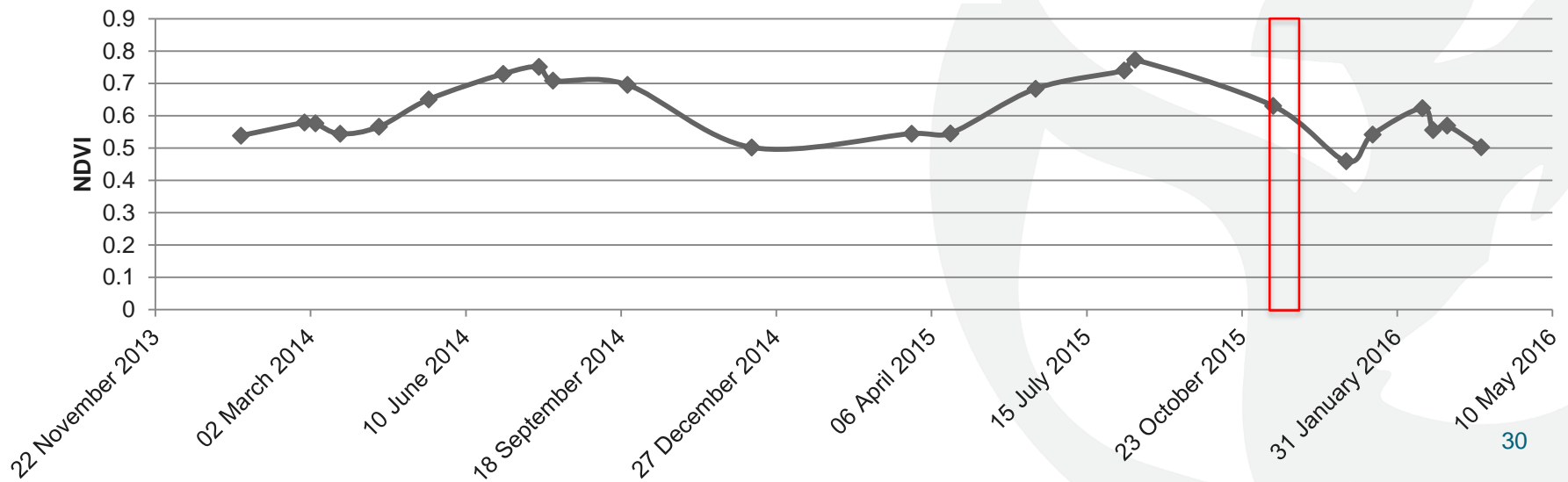
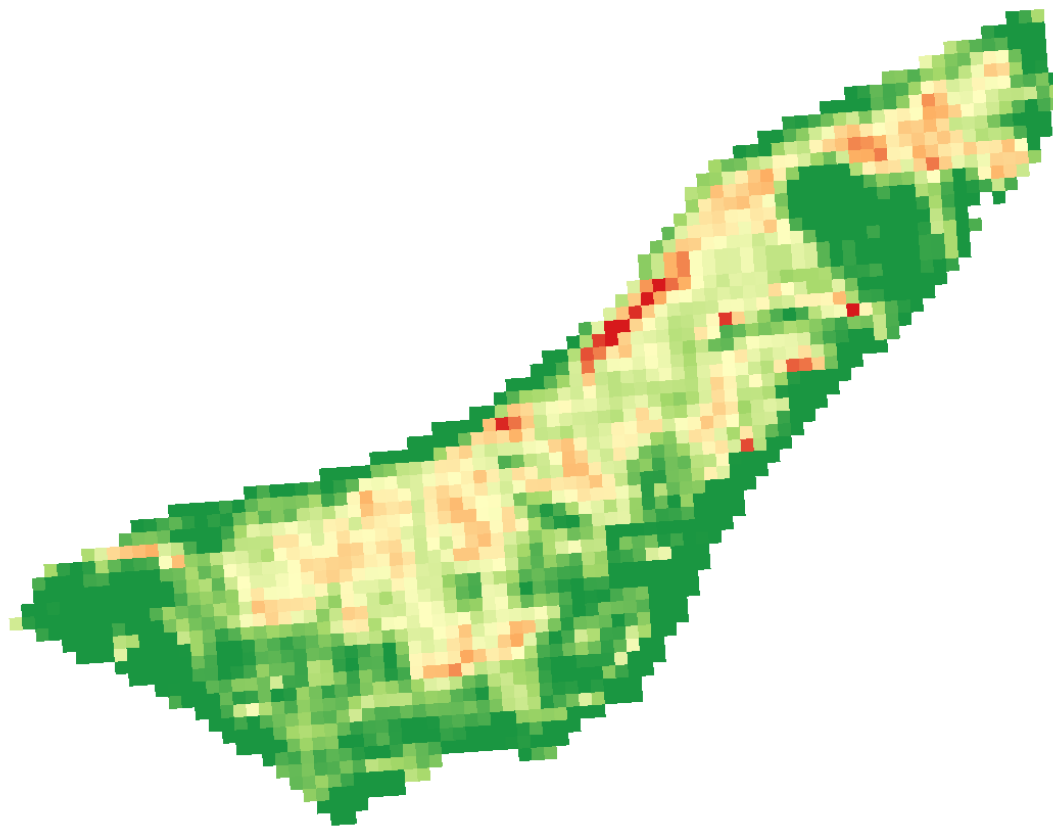


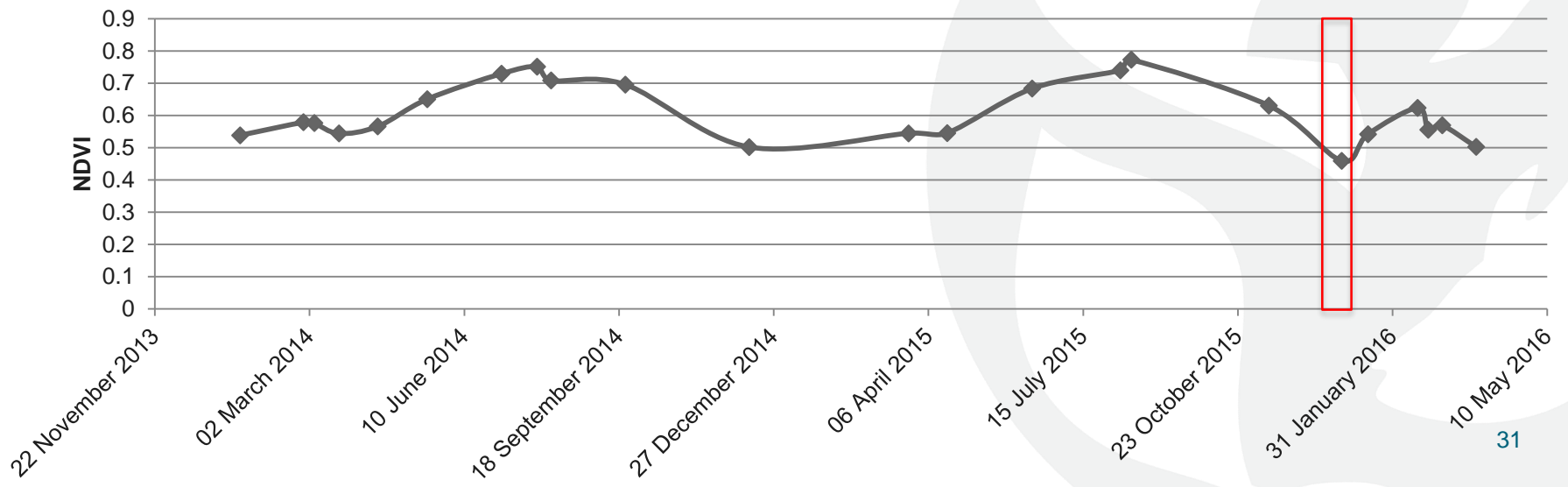
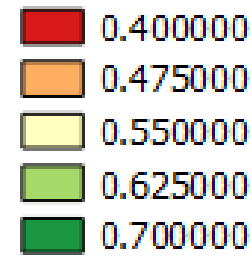
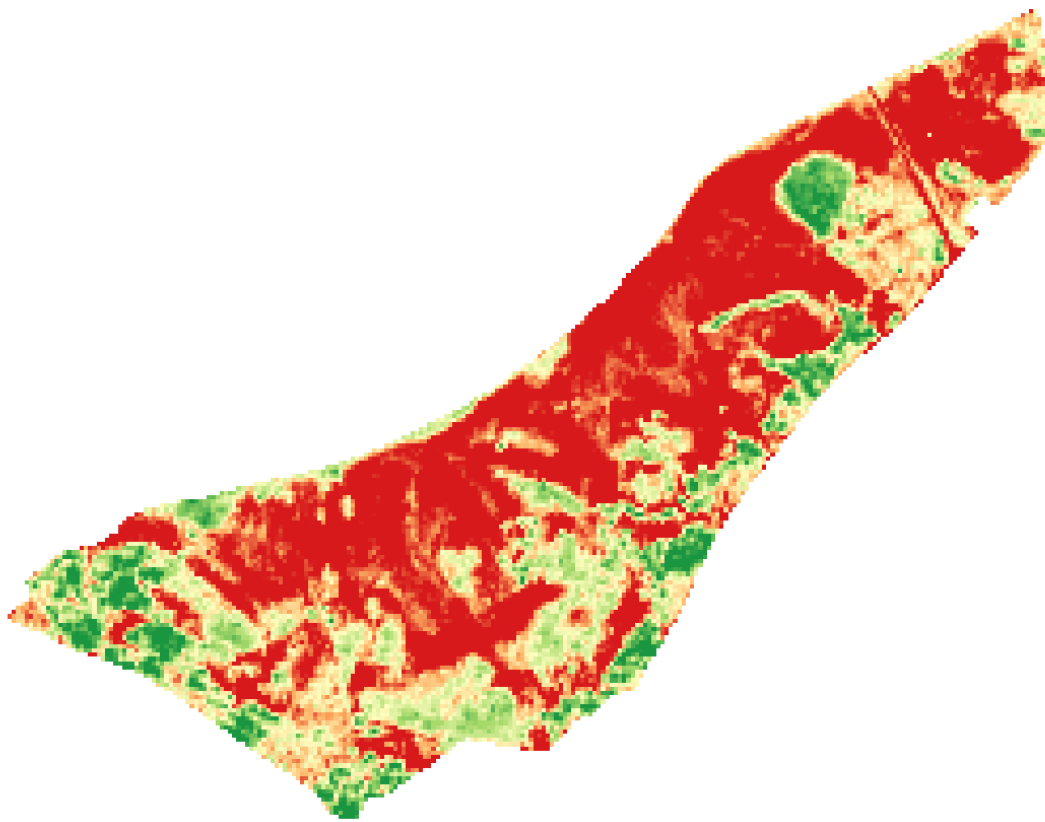


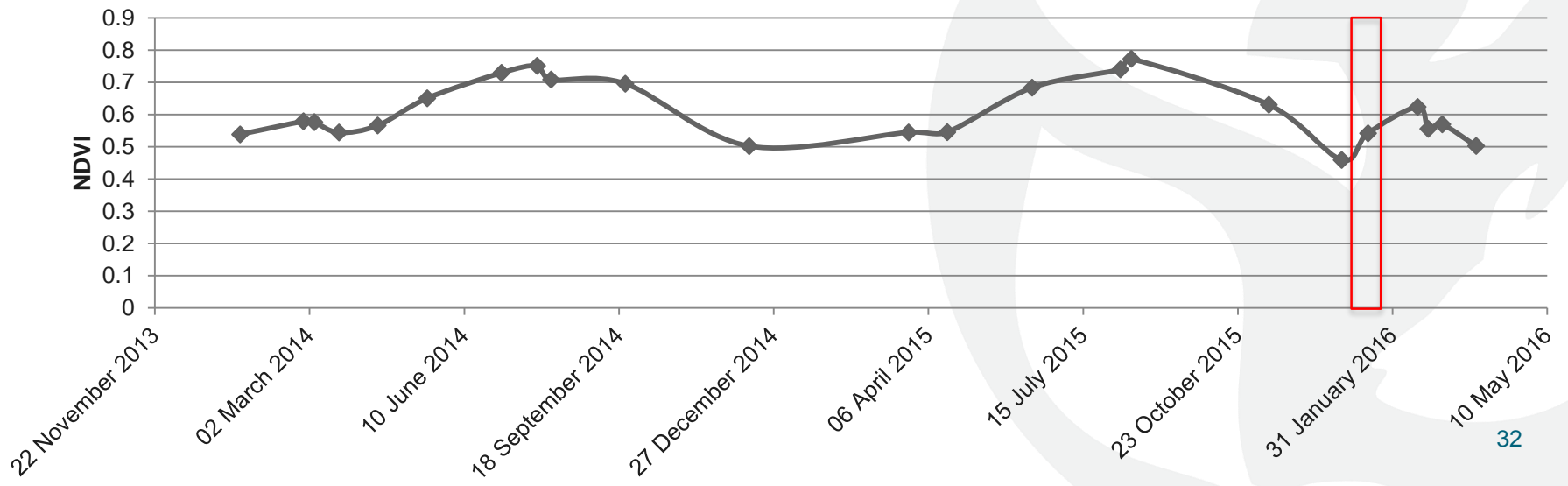
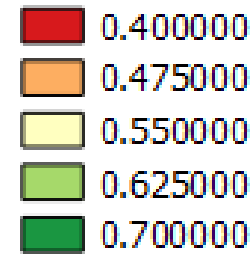
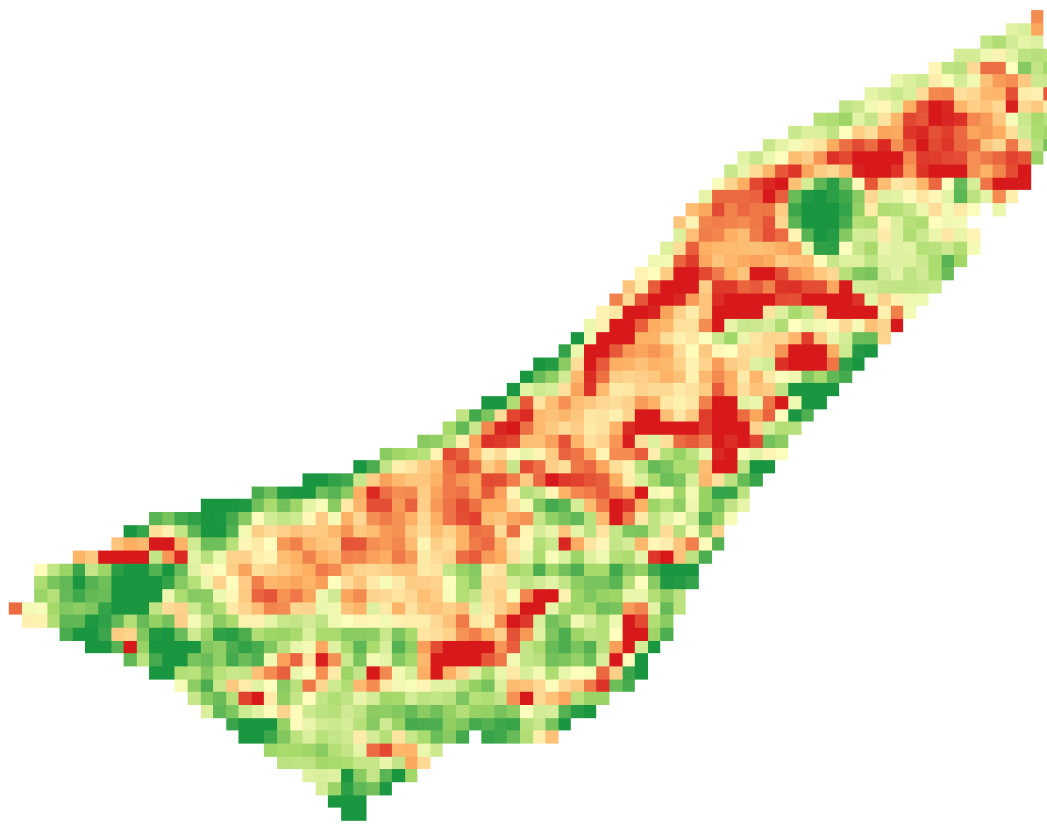


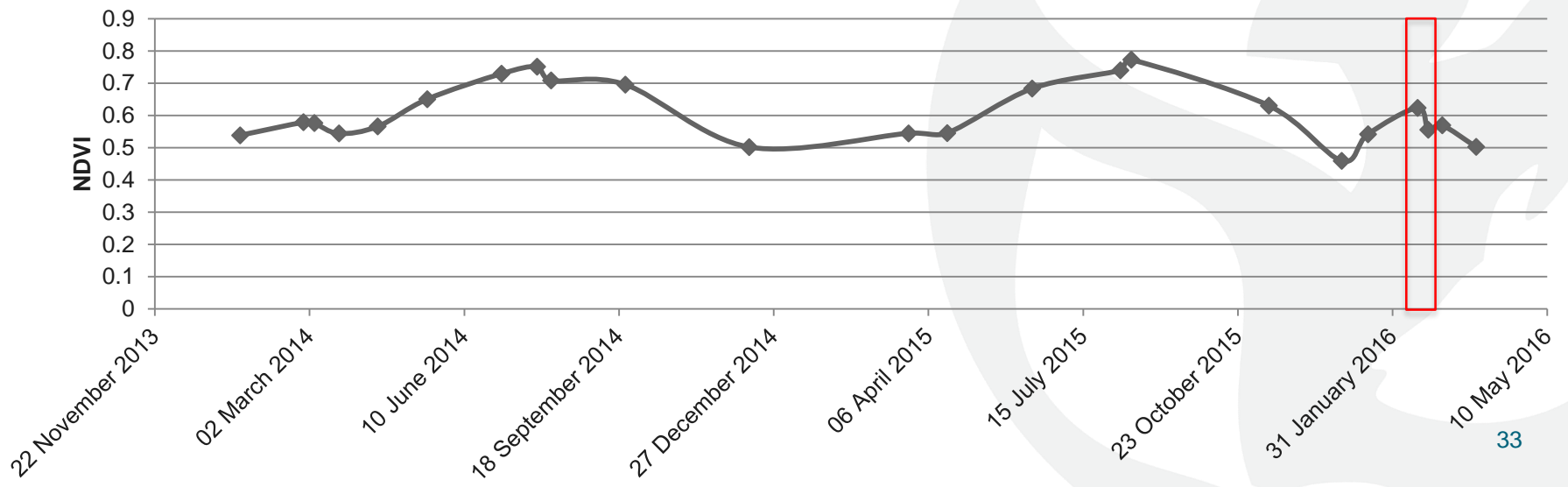
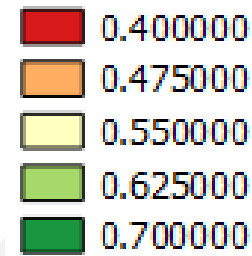
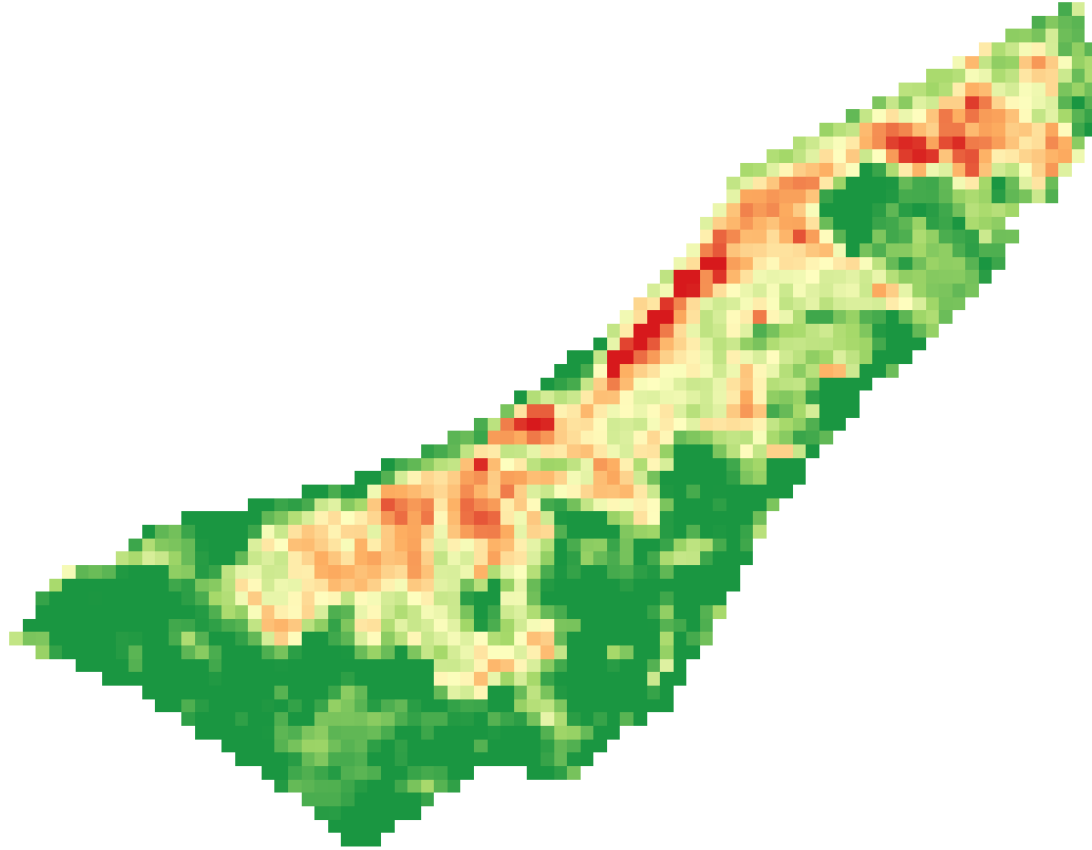


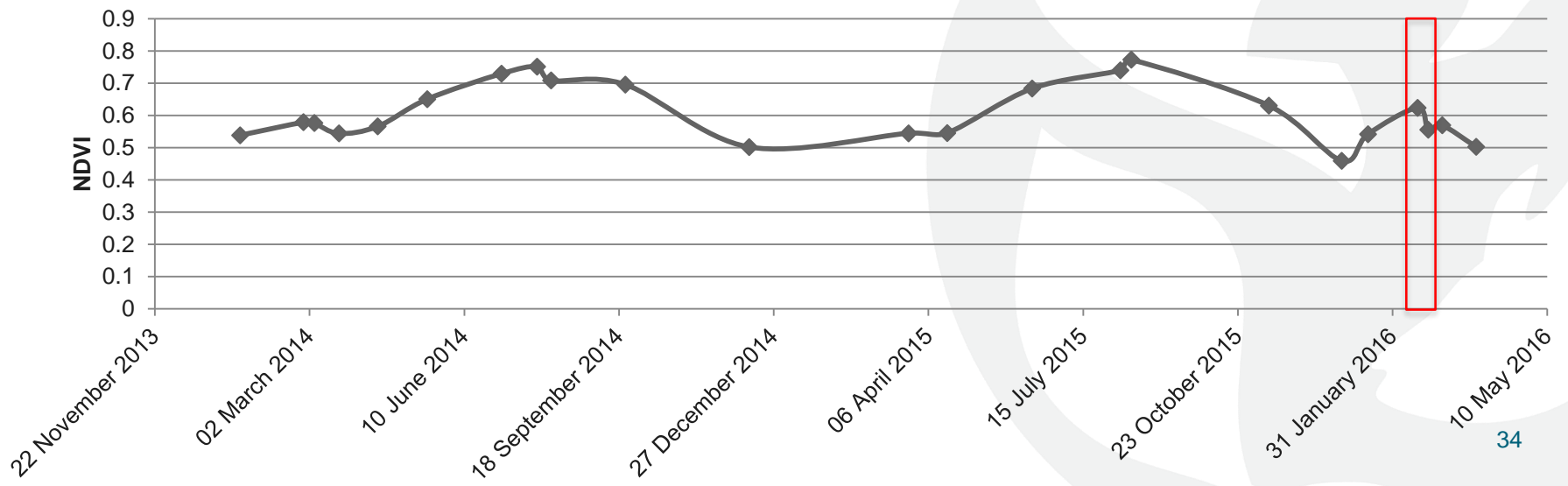
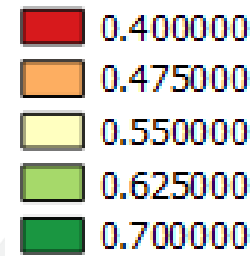
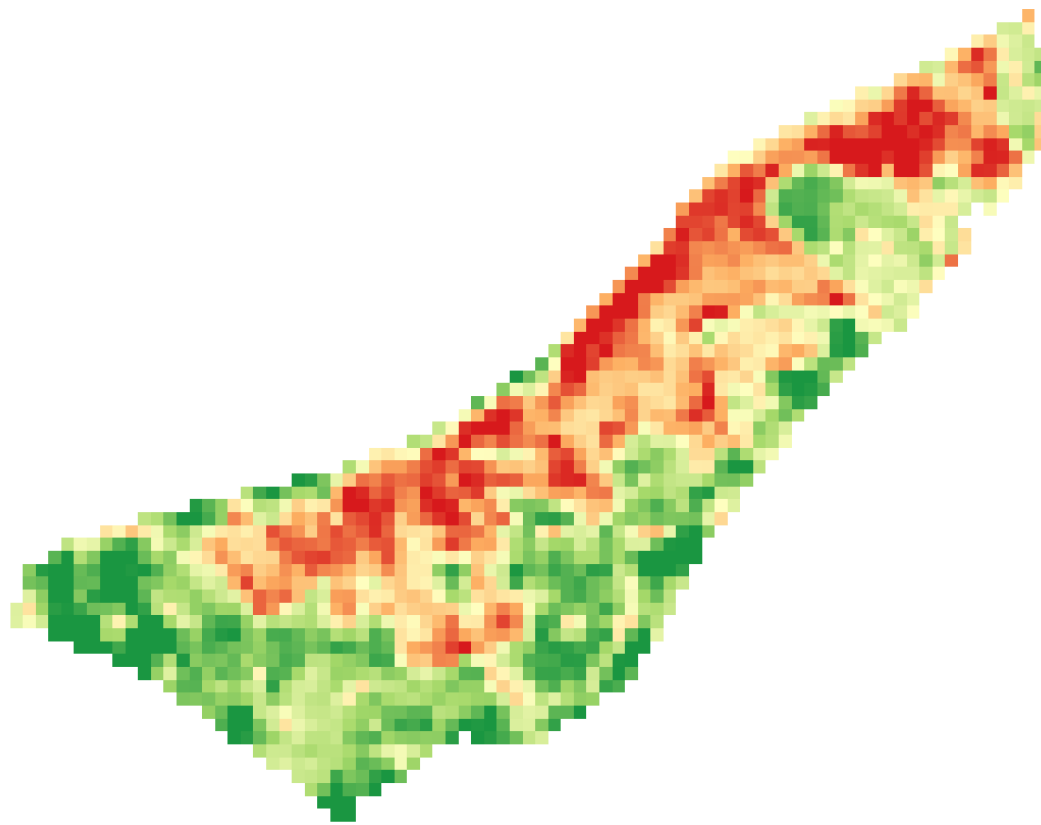


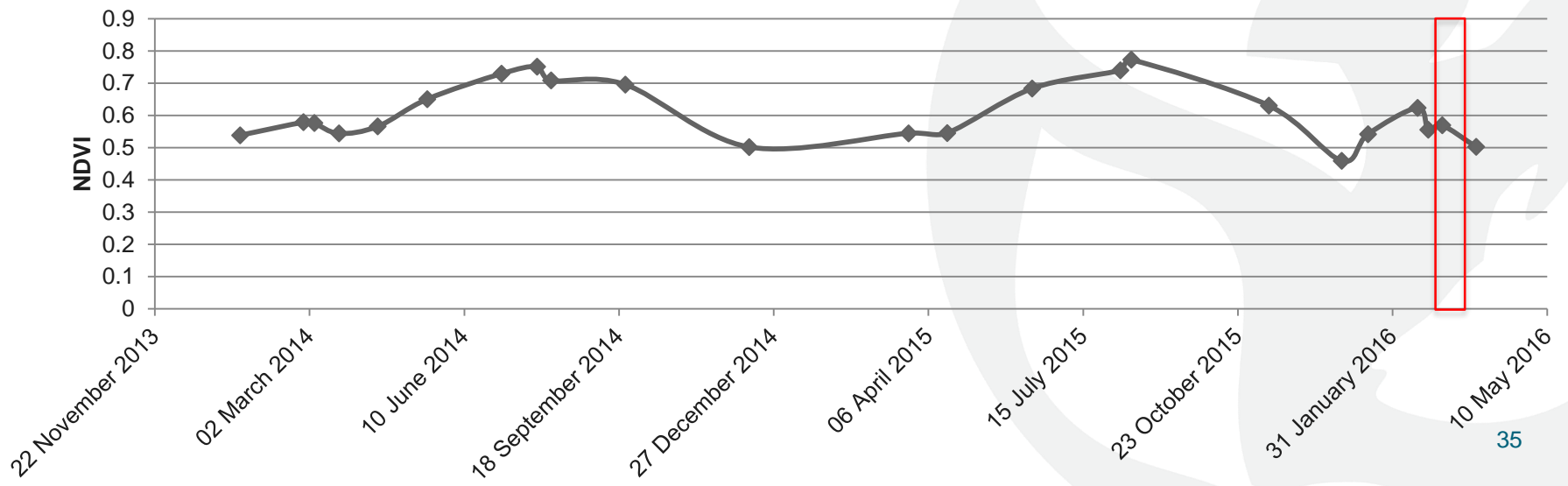
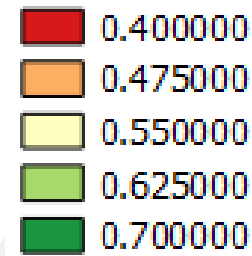
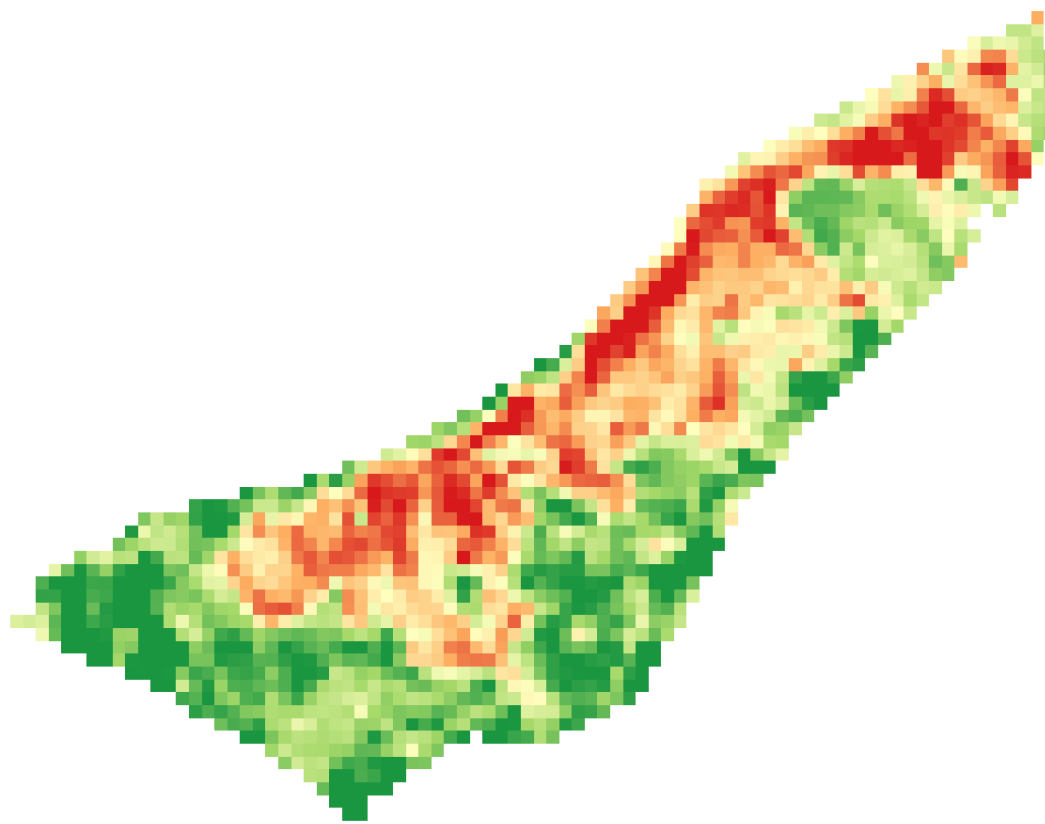


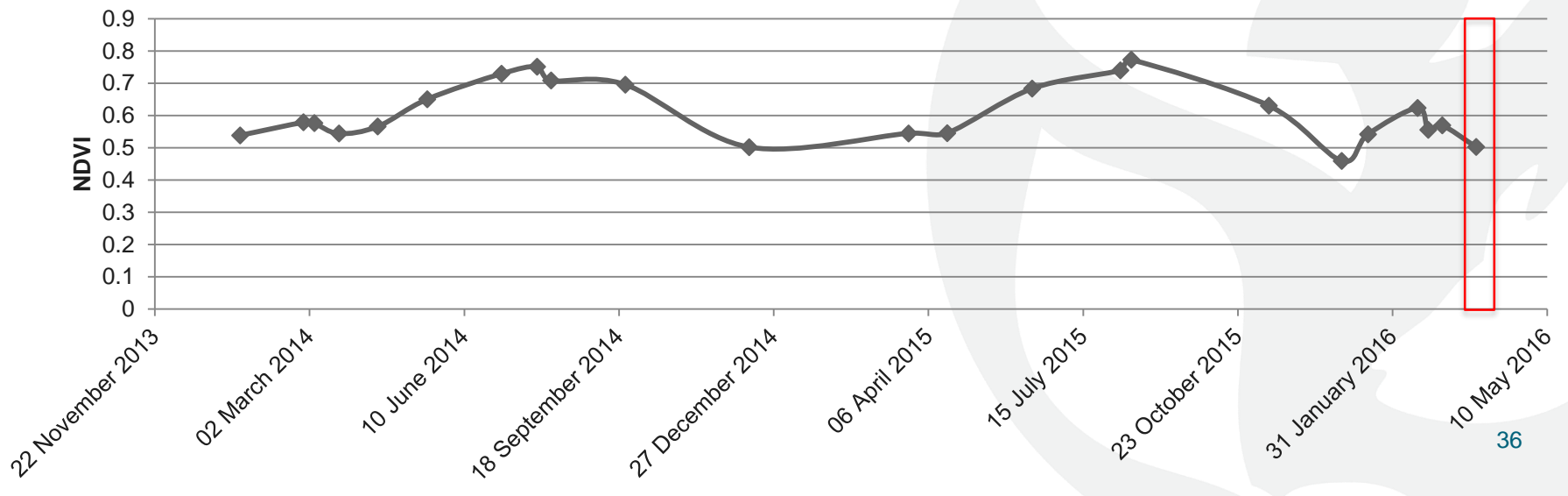
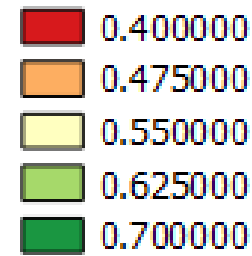
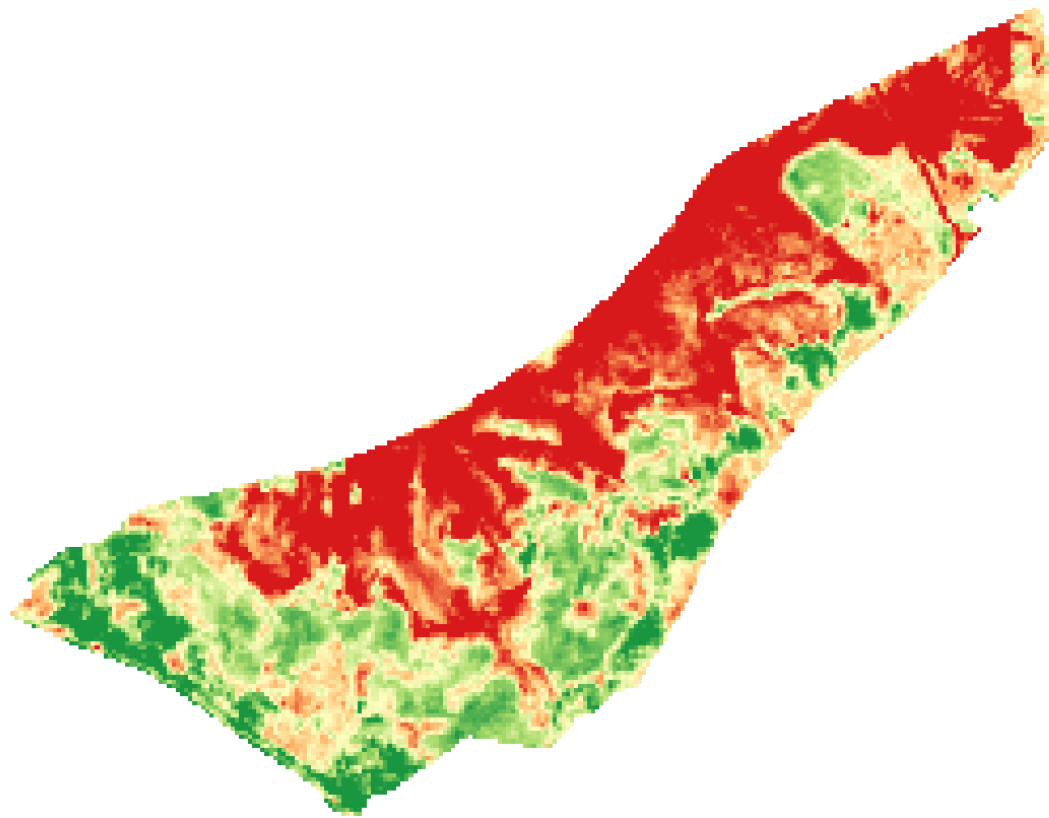










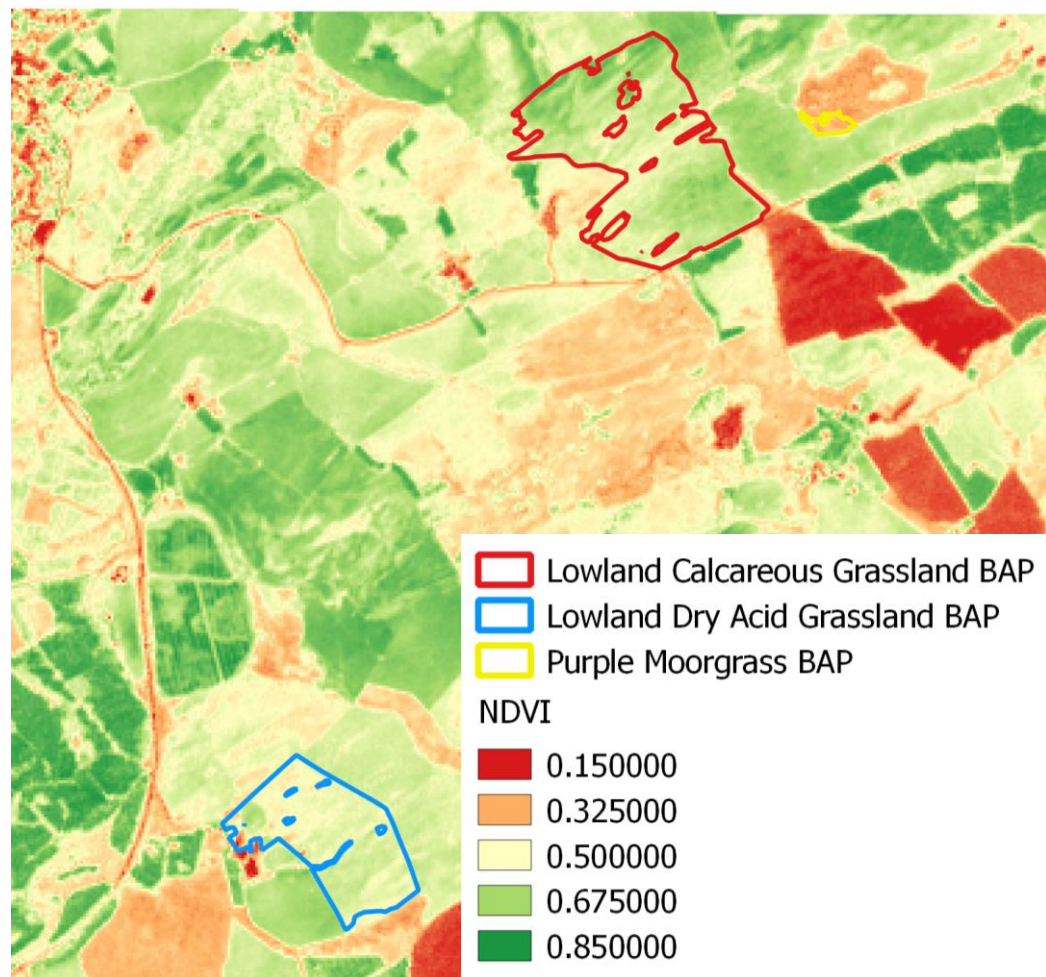
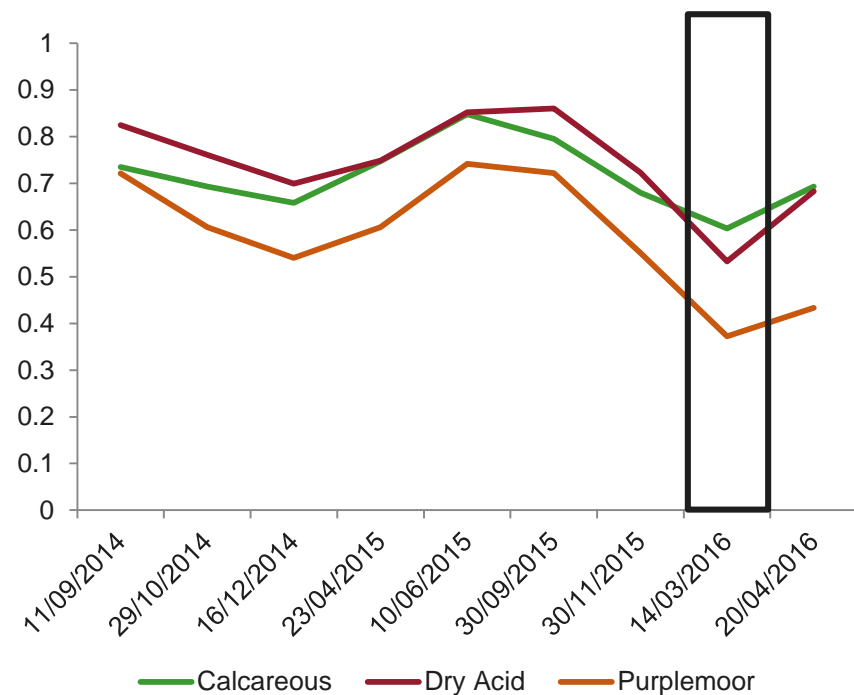


Scottish Borders Example

- Boundary data taken from results of:
Locating potential species-for grassland areas using RS project
- 3 examples chosen from BAP categories where grassland type is defined as “definitely present”

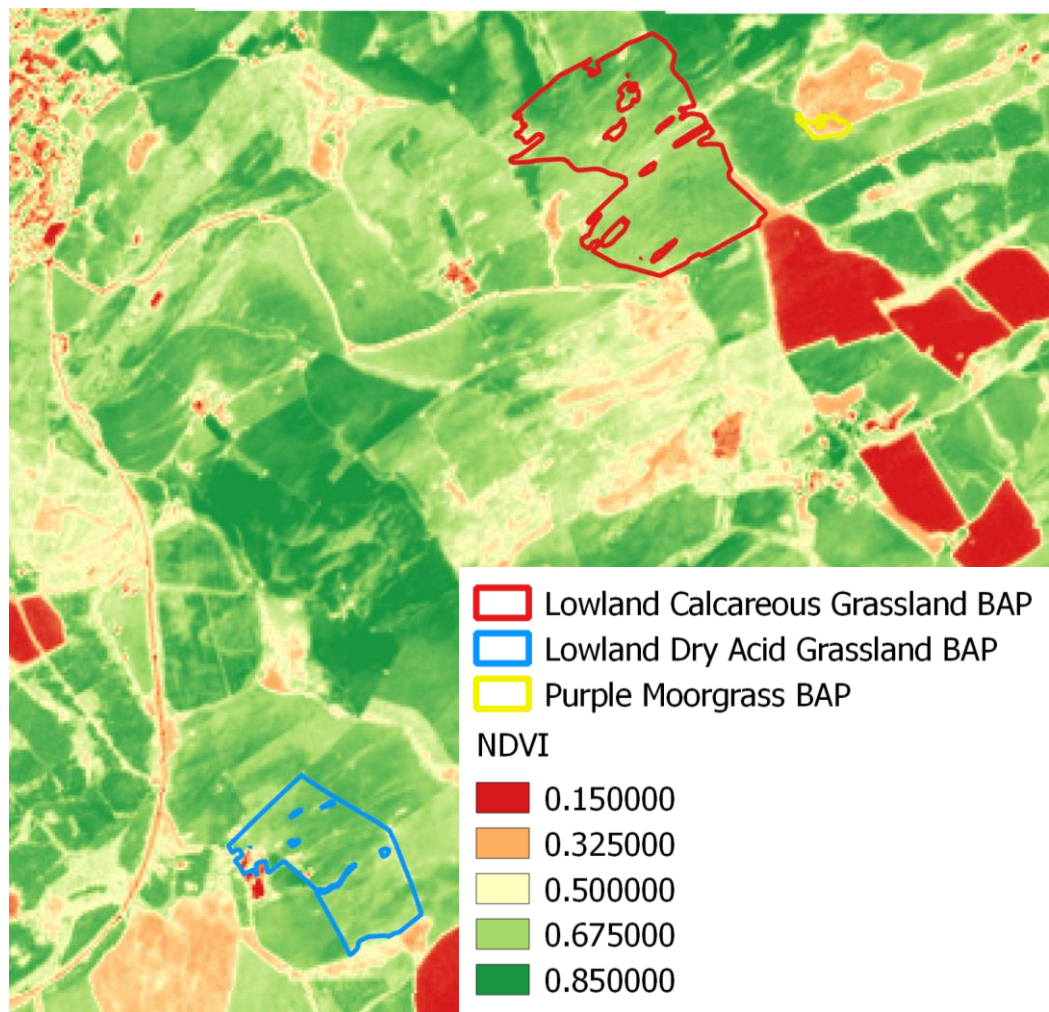
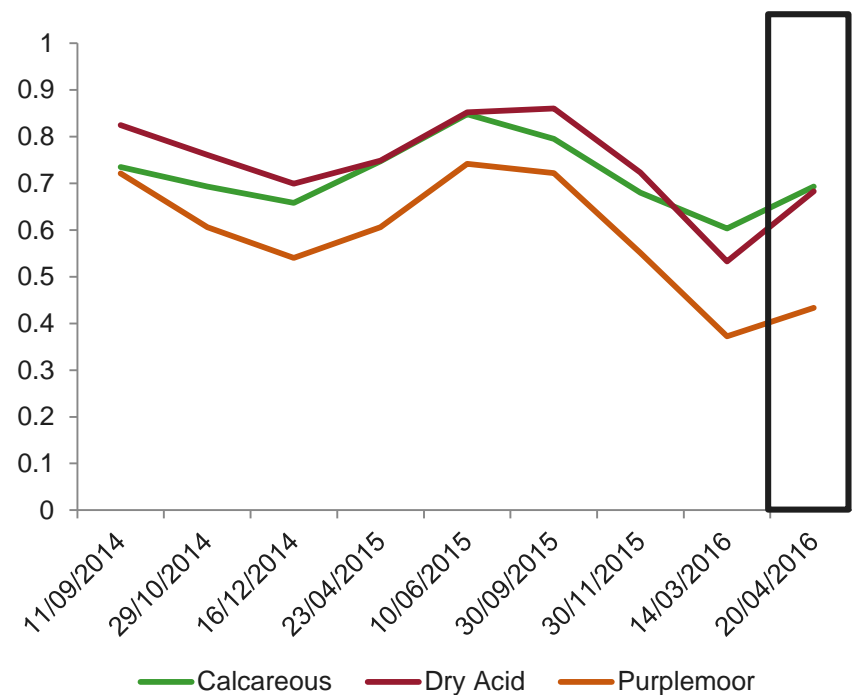


Scottish Borders Example



14 March 2016

Scottish Borders Example



20 April 2016

Scottish Borders Example

