
The contribution of CHRIS/PROBA to NCAVEO, a Knowledge Transfer network for the Calibration and Validation of EO data

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The vision for Earth Observation

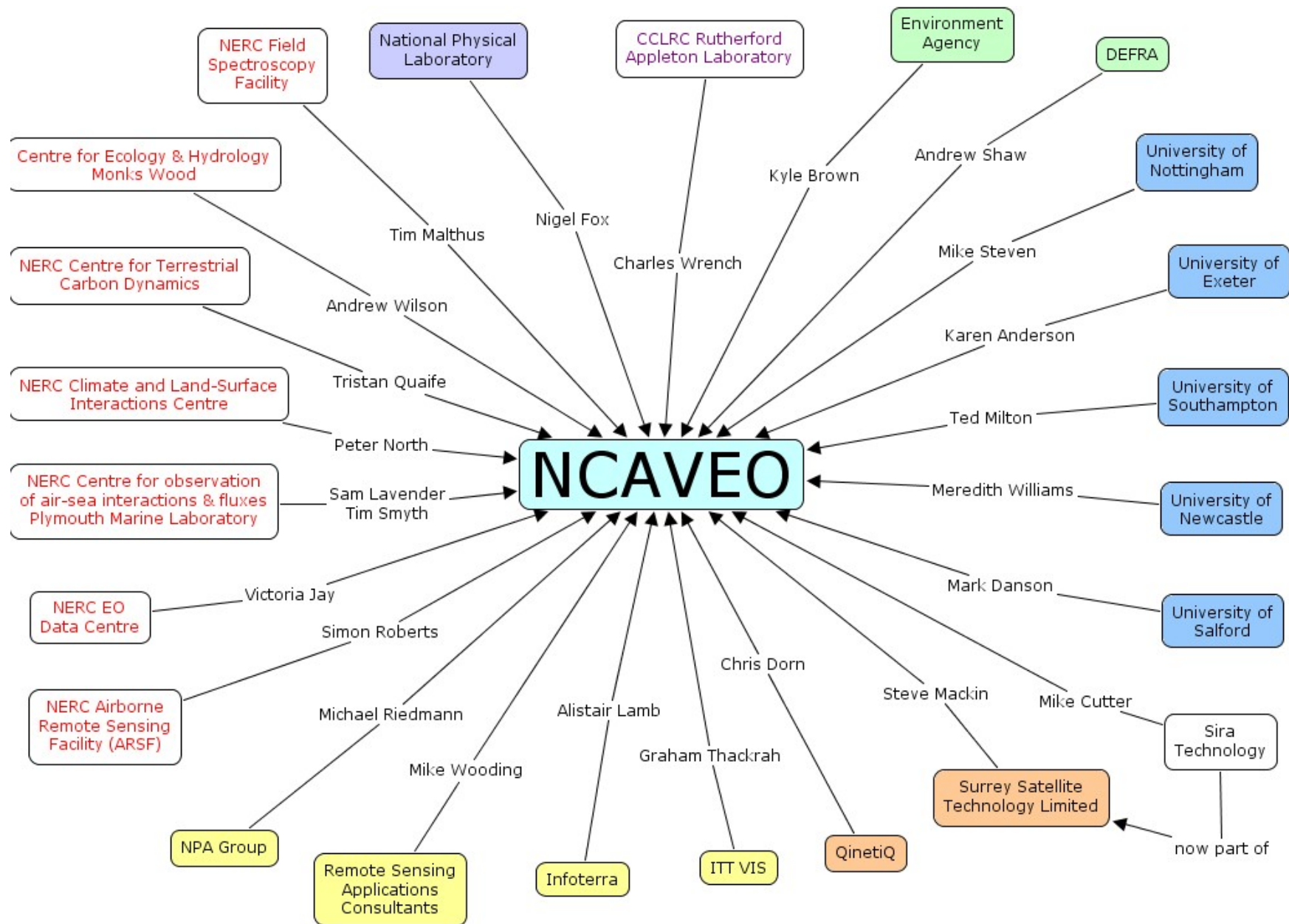
- EO as a quantitative tool
- All measurements traceable to SI
- Quality controlled, reliable, robust
- Products that are validated and consistent

The reality

- Applications often site-specific, one-off.
- Extrapolation across space
- Extension through time
- Comparability between sensors

Network for the Calibration and Validation of Earth Observation data

- KT network
- Funded directly by UK Natural Environment Research Council (NERC) and in-kind by partners
- Broad aims
 1. to inform
 2. to facilitate
 3. to advance cal/val



NCAVEO - UK Cal/Val sites : click on one of the dots for more information. - Microsoft Internet Explorer

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Address http://www.ncaveo.ac.uk/test_sites/ Go

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Harwood Forest

Monks Wood


Barton Bendish

Chilbolton

Thorney Island

Partners

- » CASIX / PML
- » CCLRC RAL
- » CEH Monks Wood
- » CLASSIC
- » CTCD
- » defra
- » Environment Agency
- » Infoterra Ltd
- » ITT VIS
- » National Physical Laboratory
- » NERC ARSF
- » NERC EO Data Centre
- » NERC FSF
- » NPA Group
- » Plymouth Marine Laboratory
- » QinetiQ
- » RSAC Ltd
- » Surrey Satellite Technology Limited (SSTL)
- » Surrey Space Centre
- » University of Exeter
- » University of Newcastle
- » University of Nottingham
- » University of Salford
- » University of Southampton

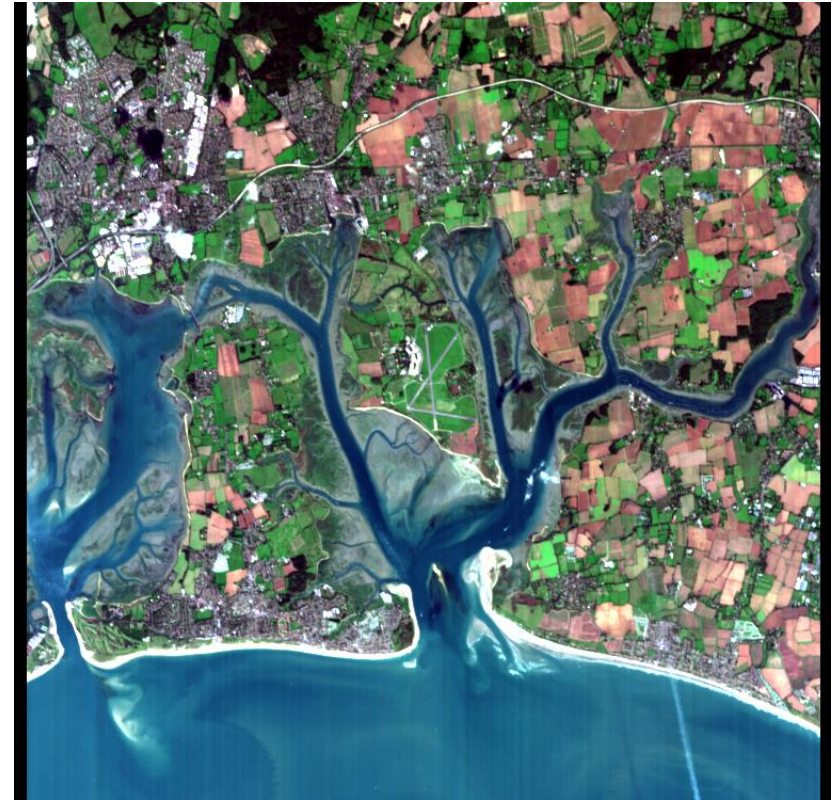
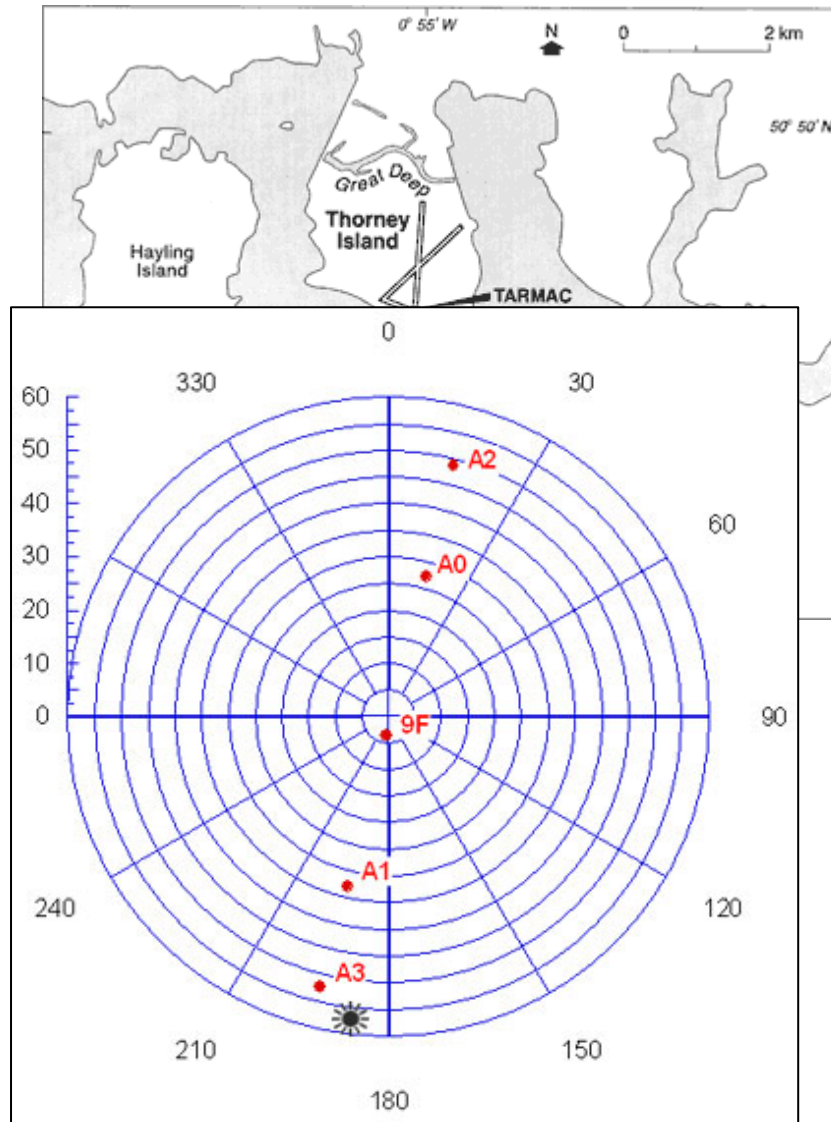
GeoData Institute 

www.ncaveo.ac.uk

Generated 05/08/02

Internet

Thorney Island experiment 2003/2004



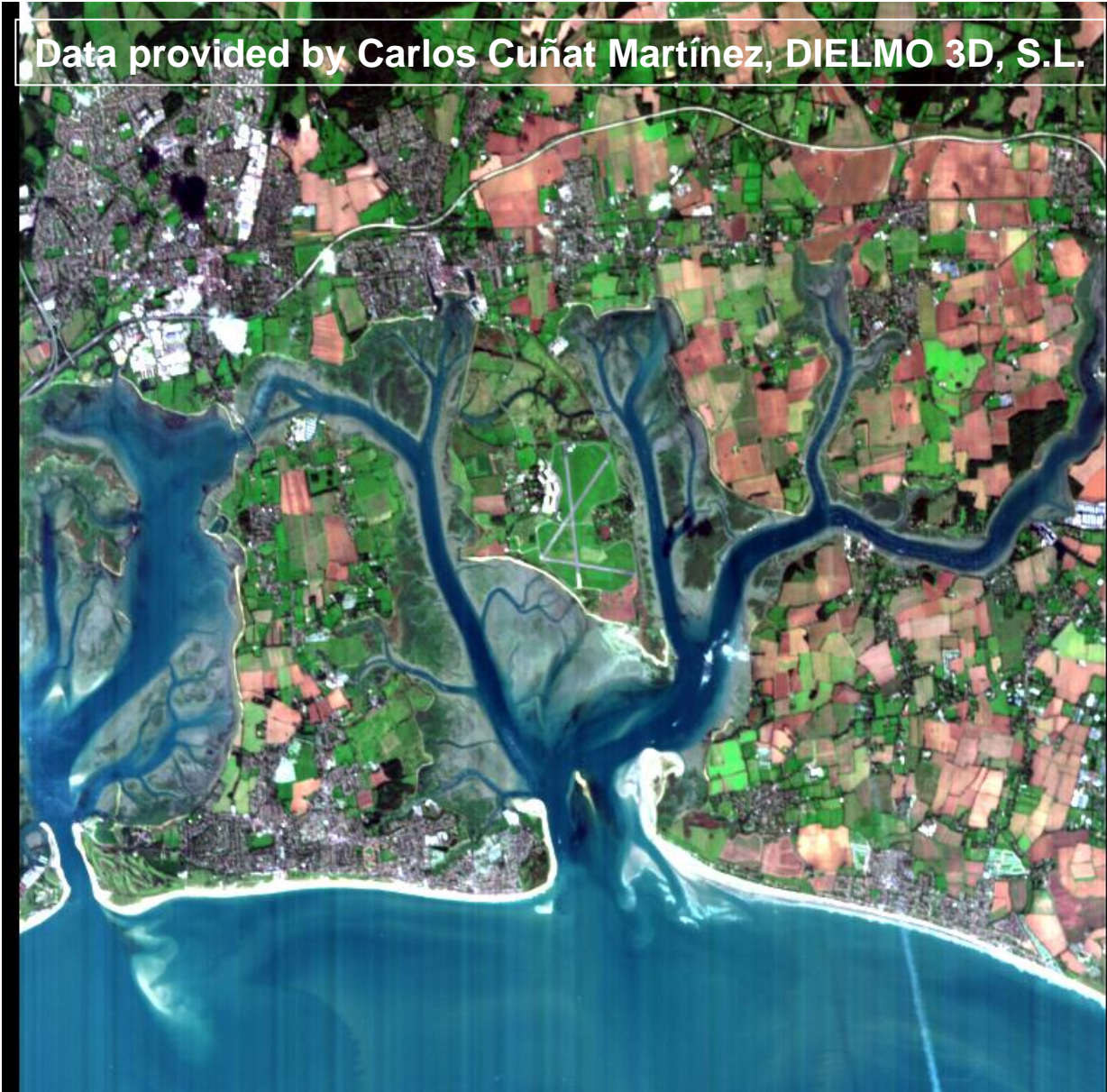
- 7th Oct 2004.
- Low tide.
- Good sampling of the solar principal plane.

Destriping the data from 7th October 2004



Destriped using DIELMO 3D method

Data provided by Carlos Cuñat Martínez, DIELMO 3D, S.L.

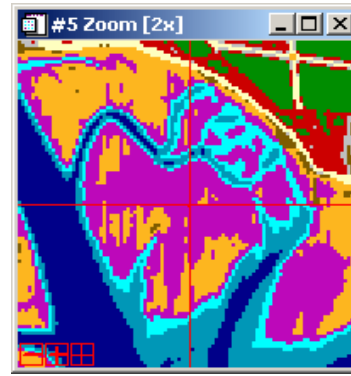


Destriped using HDFclean



HDFclean is the destriping program to be provided to CHRIS Principal Investigators by SSTL. It is based on an algorithm devised by Dr Jeff Settle, ESSC.

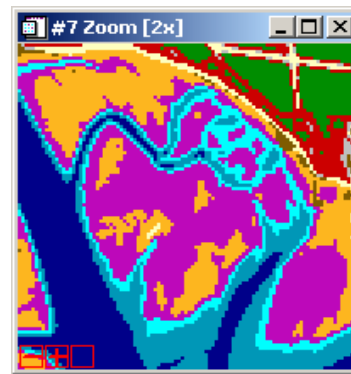
Unsupervised classification (k-means)



Original



DIELMO 3D



HDFclean

NCAVEO - Introduction - Microsoft Internet Explorer

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Introduction

Welcome to NCAVEO, the Natural Environment transfer network established to support the calibration of Earth observation data based at the University of Exeter and provides information and a forum for those interested in the current state of the art for the individuals in the field.

This website is currently under development. If you would like to contribute material, or extend the current material, please contact the Administrator. Similar to the current website, please get in touch with the Administrator. Meetings, please get in touch with the Administrator. Meetings, please get in touch with the Administrator.

Ted Milton
NCAVEO Coordinator

News

CHRIS/PROBA data from Chilbolton...

As part of the NCAVEO 2006 Field Campaign, data from the Compact High Resolution Imaging Spectrometer (CHRIS) on-board the ESA PROBA satellite were acquired at the same time that teams were making measurements on the ground. The image shows a color composite of the CHRIS data collected on 17th June 2006.

[read more](#)

Posted 17th July 2006

NCAVEO

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Address http://www.ncaveo.ac.uk/special_topics/atmospheric_correction/

Atmospheric correction

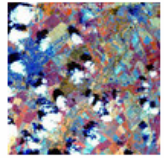
The question is sometimes asked: what is the effect of atmospheric correction for the effect of wavelength region being selected? The data will be used for aircraft and satellite sensors. There are a number of methods here. The first is to use the Data assimilation (DN) values, with no conversion. This approach may be acceptable.

[Surrey Space Centre](#)
[University of Exeter](#)
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GeoData Institute



Cal/Val discussion forum



Done

Internet

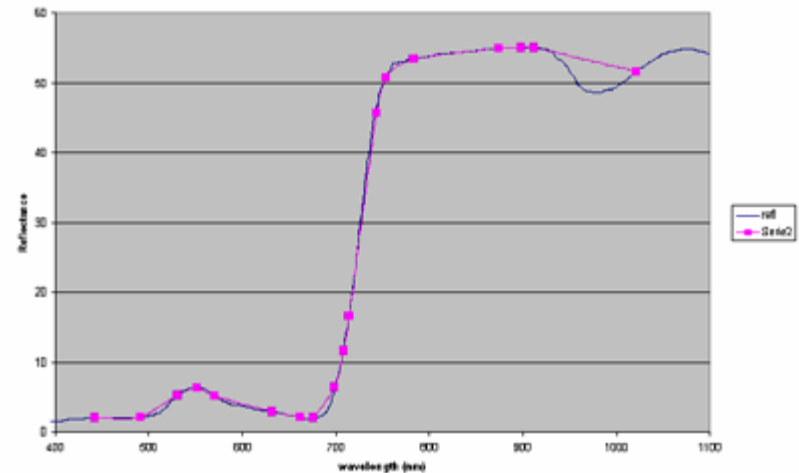
Website examples of atmospheric correction

Data sets used in the examples	Method
1. Landsat ETM+ multispectral	Antunes-6S
2. CHRIS/PROBA superspectral	MODTRAN-4
3. IKONOS multispectral	ATCOR-2
4. CASI superspectral	ACORN Empirical line (in prep.)
5. CASI hyperspectral	FLAASH (in prep.)

http://www.ncaveo.ac.uk/special_topics/atmospheric_correction/

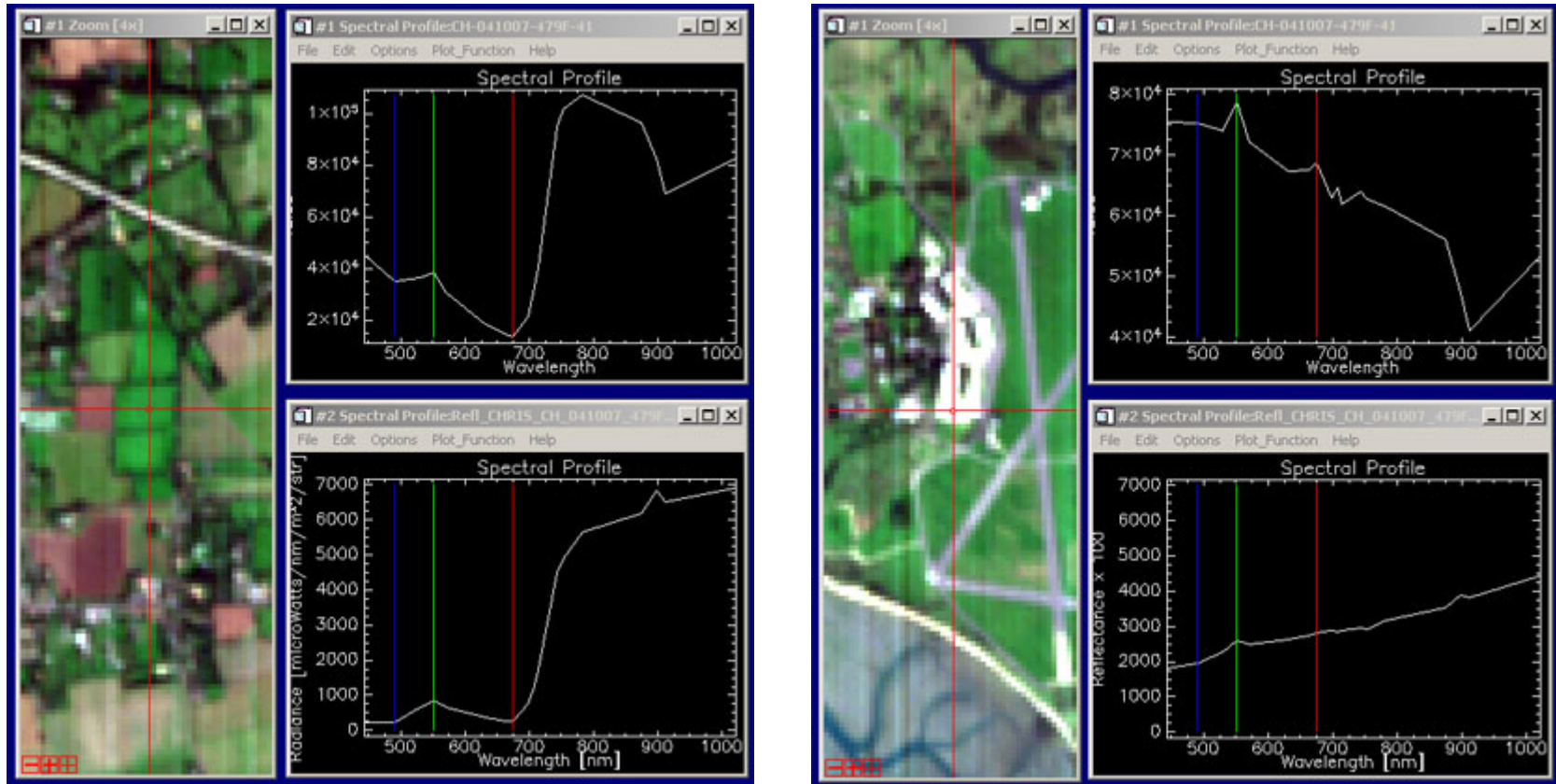
Atmospheric correction by Luis Guanter

- MODTRAN-4
- Low signal level
- Mode 3 data



- **Estimating the aerosol optical thickness (AOT)**
DN values of deep water pixels.
- **Estimating the water vapour column content**
Assumed ground surface reflectance was linear across the wavelength region sensed by CHRIS bands 14 to 17 (780 to 900 nm).

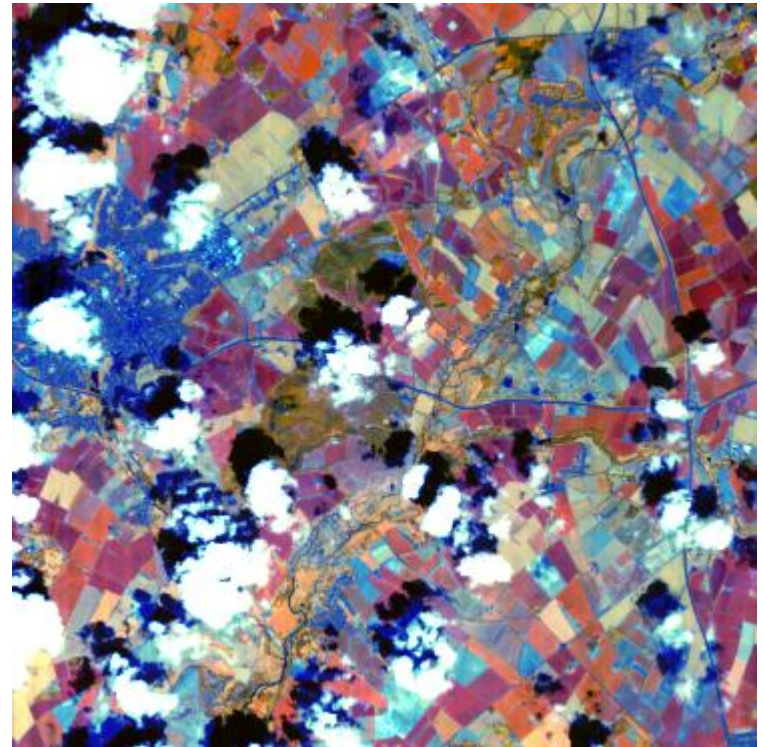
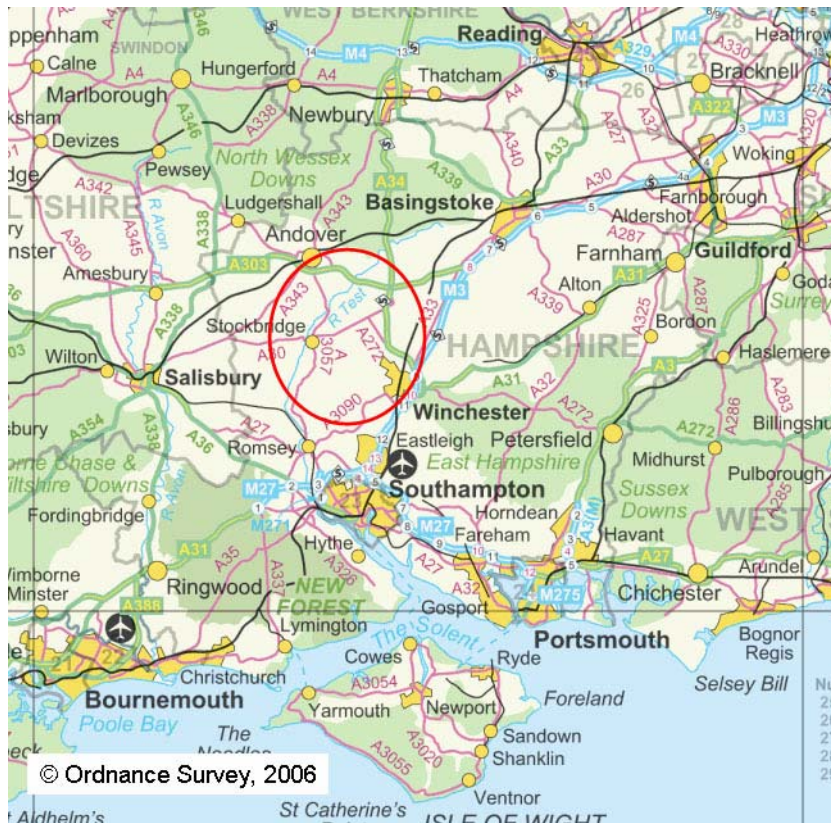
Results



Further 'challenges'

- coastal location: marine/terrestrial aerosols
- biological surface crust: spectral dynamics

Chilbolton Cal/Val experiment 2006



CHRIS acquisition : 17th June 2006

Aims of the Chilbolton Cal/Val experiment

- Bring together a group of people from academia, industry and government, all interested in cal/val.
- Investigate the practicalities of establishing a VALERI site in the UK.
- Create a large multi-sensor, inter-calibrated dataset, including high quality ground data.

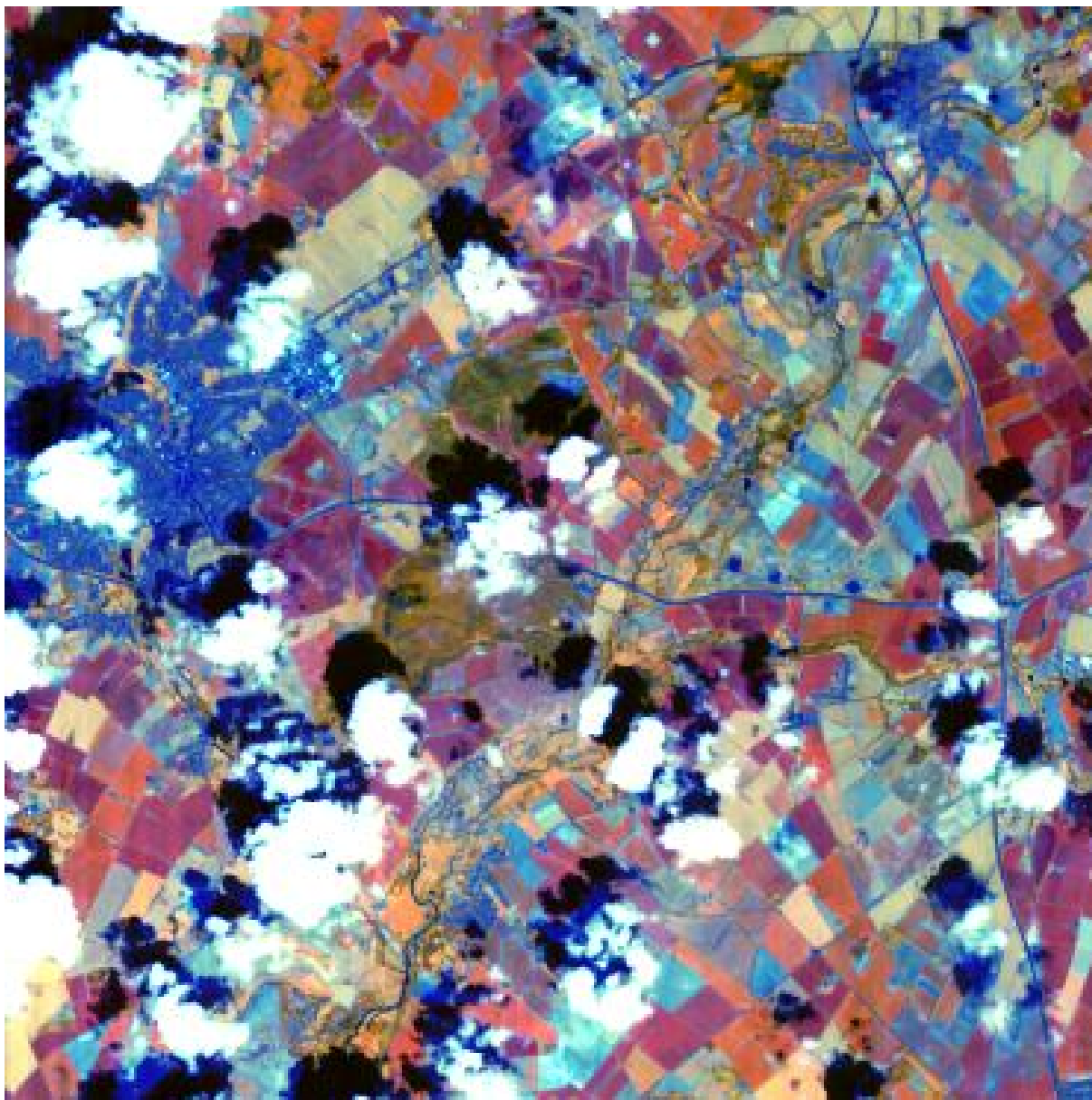


RS data successfully acquired

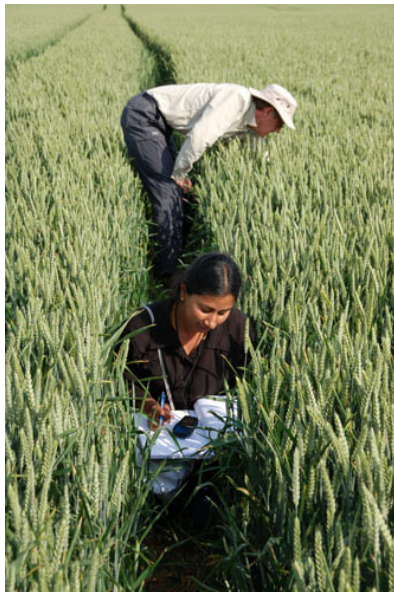


Date	Sensor/Platform
9 th June	Digital multispectral air photography / OS
10 th Jun	SPOT-5 HRG
16 th June	<ul style="list-style-type: none"> CASI, LiDAR & digital air photography / EA aircraft Aisa Hawk / NERC aircraft
17 th Jun	CHRIS/PROBA (Mode 1, 62 bands)
Multiple	DMC UK, Beijing-1, AISat, Nigeria-1

Chilbolton site 17th June 2006

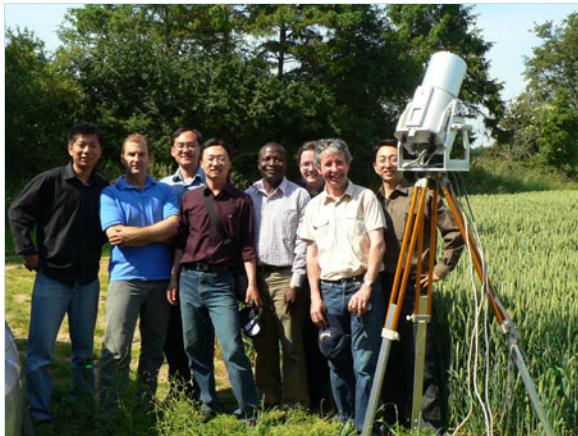
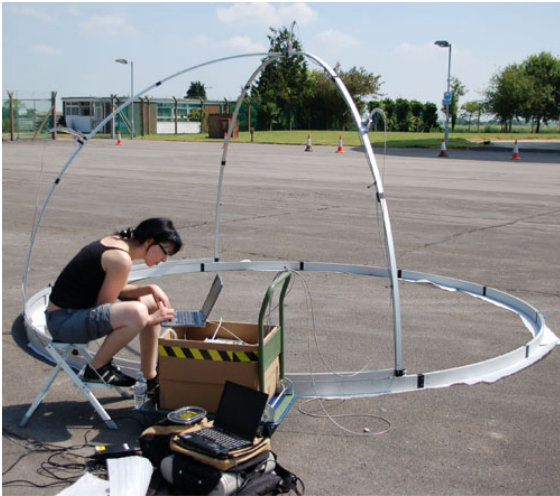


Examples of ground data successfully acquired

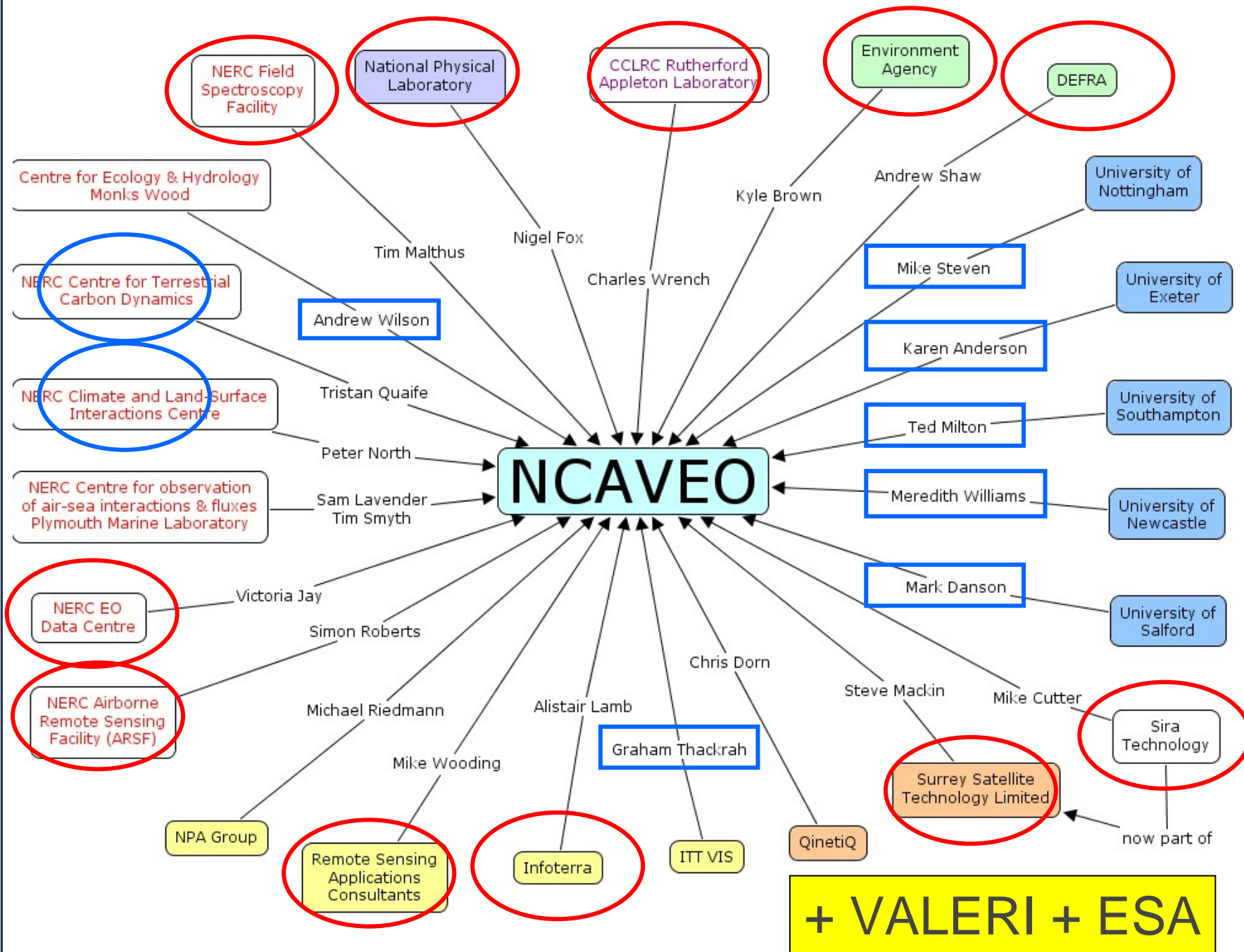


Parameter	Method
Land cover	Field survey
Radiance calibration of seven spectroradiometers	NPL TSARS
Intercalibration of Spectralon reference panels	Field expt
Reflectance of tarps and VC targets	ASD FieldSpec and goniometer
LAI of wheat, barley, oats and oilseed rape	LAI-2000 and SunScan
Soil moisture	Dielectric properties
Site location	DGPS
Canopy gap fraction	Hemi photos and Laser profiler
Atmospheric data	Sunphotometry (AERONET site)

Examples of ground data successfully acquired



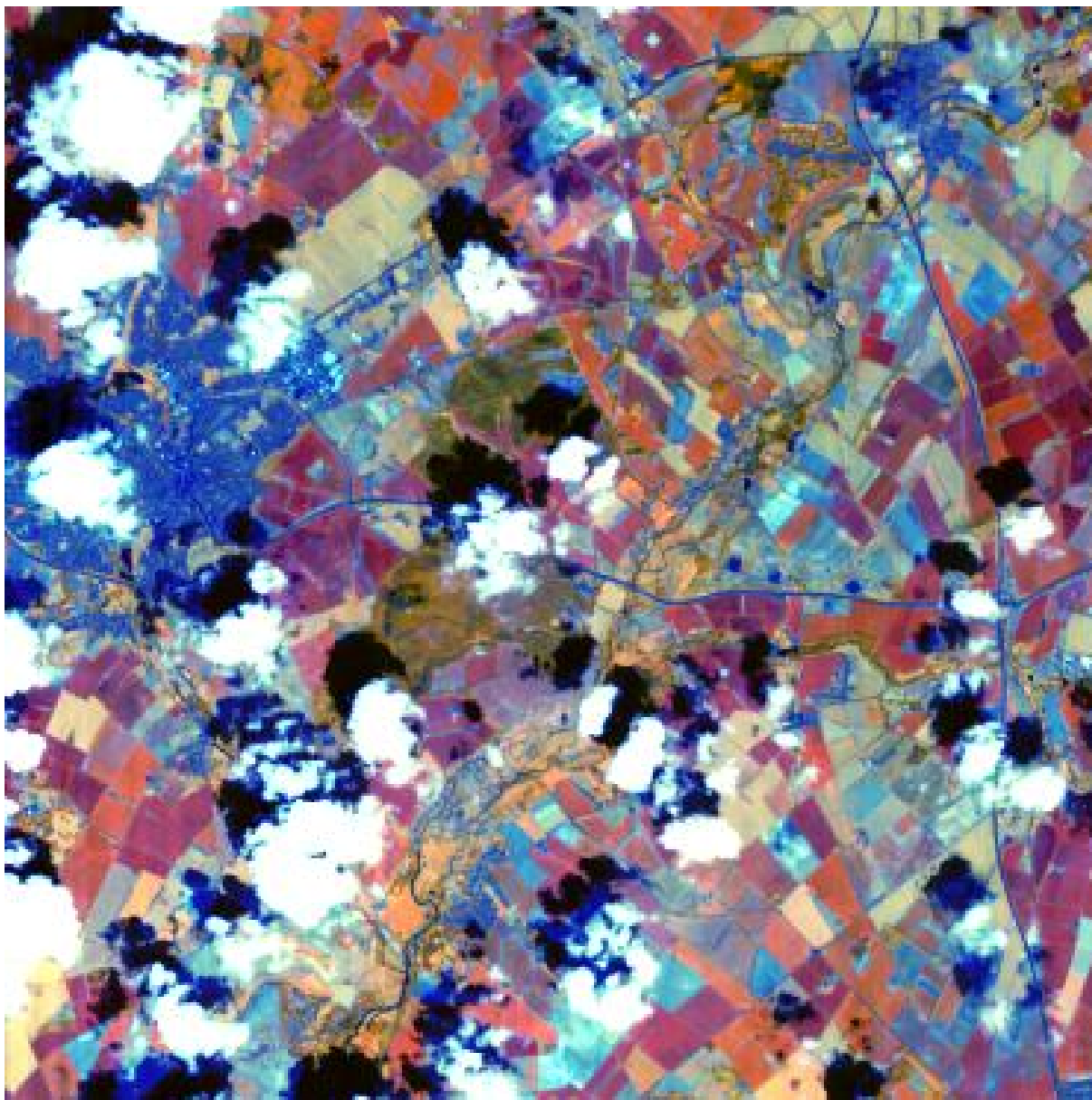
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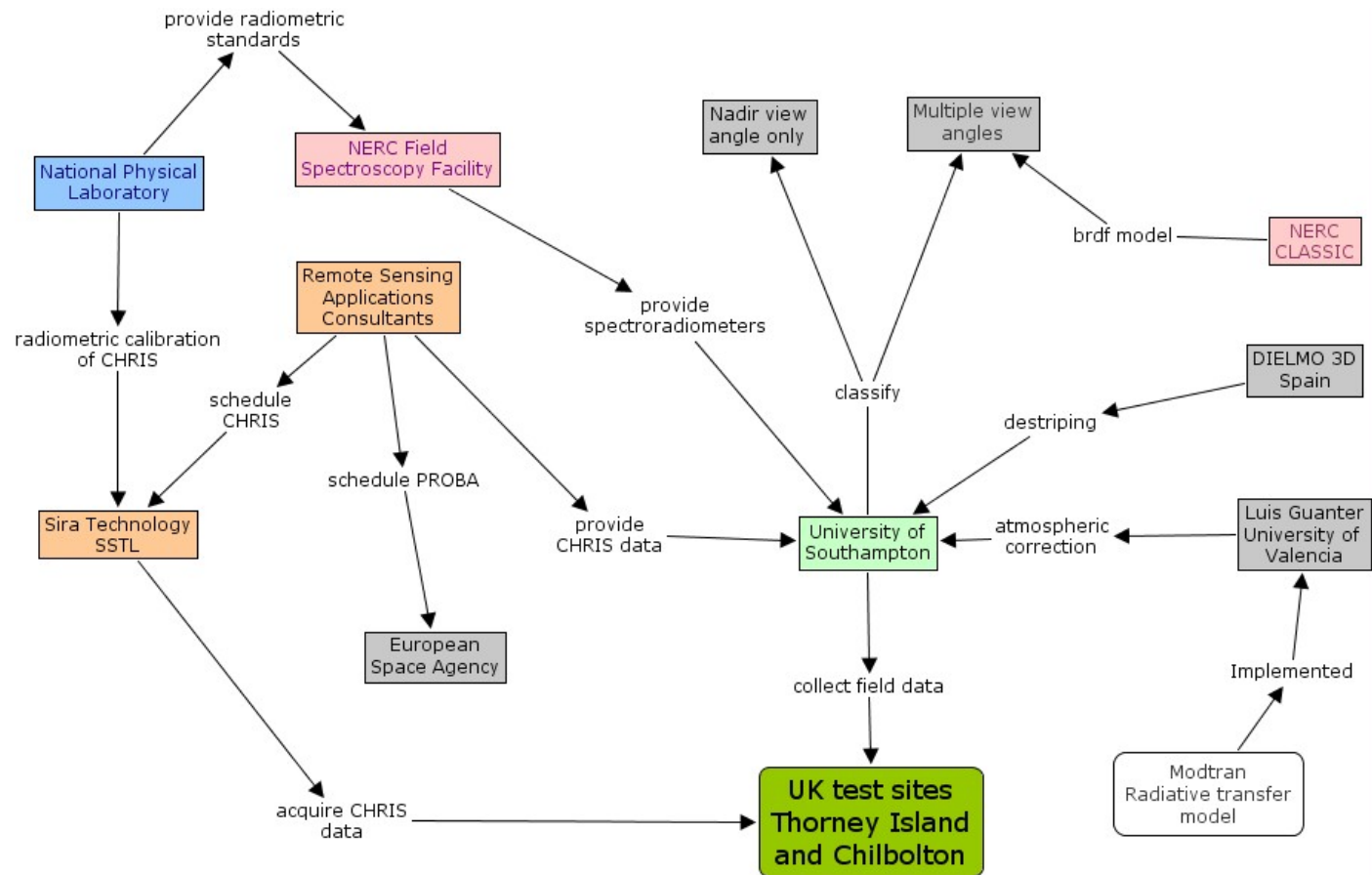


Conclusion

- Widespread recognition of the importance of cal/val amongst researchers and those in the value-added sector.
- Financial and practical support for cal/val is fragmented and (for much of the land community) ineffective, in the UK at least.
- However, high gearing is possible (achieved 1:10 for NCAVEO 2006 cal/val expt).
- NCAVEO, and the 2006 cal/val expt are delivering 'knowledge transfer' in a very practical way. Need to build on this.
- CHRIS/PROBA provides an excellent exemplar of end-to-end cal/val.

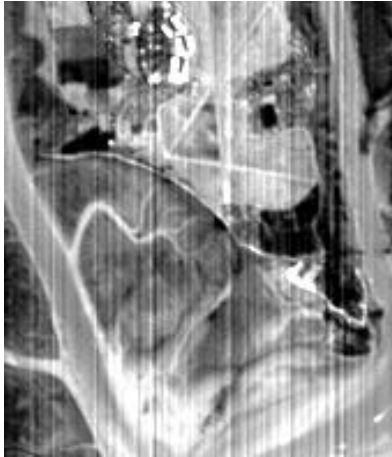
Chilbolton site 17th June 2006





Principal component 3

Original



DIELMO 3D

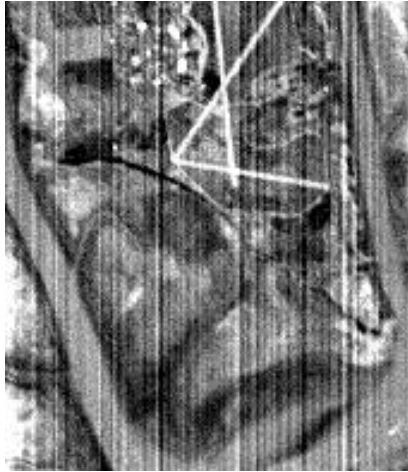


HDFclean



Principal component 5

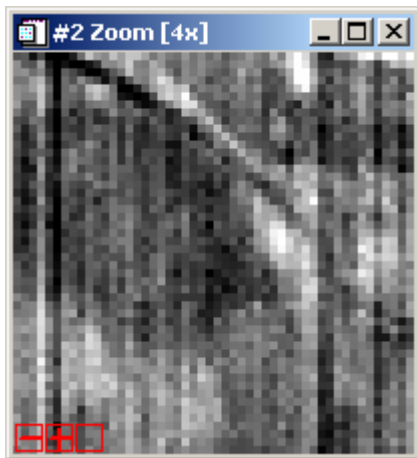
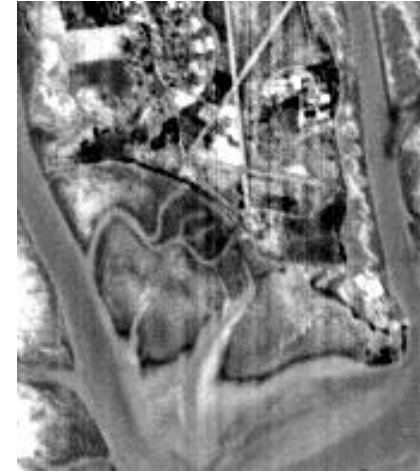
Original



DIELMO 3D



HDFclean



Accessing data from the experiment

The screenshot shows a Microsoft Internet Explorer browser window displaying the NERC Earth Observation Data Centre website. The address bar shows the URL: <http://www.neodc.rl.ac.uk/?option=displaypage&Itemid=143&op=page&SubMenu>. The website features a blue sidebar with navigation links: Home (About the NEODC, News, Contact us, My NEODC), NEODC Data (Information, Search for data, Browse datasets), Other EO Data (Information), Community (NERC, Centres of Excellence, Workspaces, Projects, EO links), and Help (Self-Help tutorials, FAQs). The main content area has a header with the NERC Earth Observation Data Centre logo and a banner image. Below the banner, there is a section titled "Fact Sheet: NCAVEO Field Experiment" and "NCAVEO Field Experiment". A box contains links: "Register as an NEODC customer", "Request access to this dataset", "Browse this dataset", and "Enquiries". An "Introduction" section follows, describing the NCAVEO project and its aim to undertake a validation exercise based on the VALERI project. At the bottom, there are two photographs of researchers at a field experiment site, with the caption "Researchers at Field Experiment Site (source: NCAVEO)". The Natural Environment Research Council logo is visible in the bottom left corner of the website.

NERC Earth Observation Data Centre - Microsoft Internet Explorer

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NERC Earth Observation Data Centre
Meeting the needs of NERC Science and Survey with Earth Observation Data and Information

Fact Sheet: NCAVEO Field Experiment

NCAVEO Field Experiment

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Introduction

The Network for Calibration and Validation of EO data [NCAVEO](#) organised a cal-val field experiment at Chilbolton in June 2006. The aim is to undertake a validation exercise based on the protocols and methods developed by the [VALERI](#) project, but modified as necessary for UK conditions. The experiment is a scoping exercise for the establishment of one or more VALERI sites in the UK as well as an opportunity to learn and share best practice amongst NCAVEO partners and the wider community.



Researchers at Field Experiment Site (source: NCAVEO)

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