

# TURNING ENVIRONMENTAL DATA INTO COMPETITIVE ADVANTAGE

Debbie Clifford

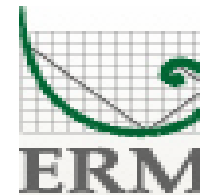
30<sup>th</sup> June 2017 – NCEO conference, University of Bath

# THE INSTITUTE FOR ENVIRONMENTAL ANALYTICS

- Established mid-2015 with c.£5m start-up funding to create a centre of excellence for data analytics focussed on environmental challenges
- We have an expert team, hosted at the University of Reading, with knowledge of data science, algorithm development, software engineering and data visualisation
- We work with organisations who see opportunities for environmental data to manage risk, improve business operations and open up new markets



# IEA PARTNERS



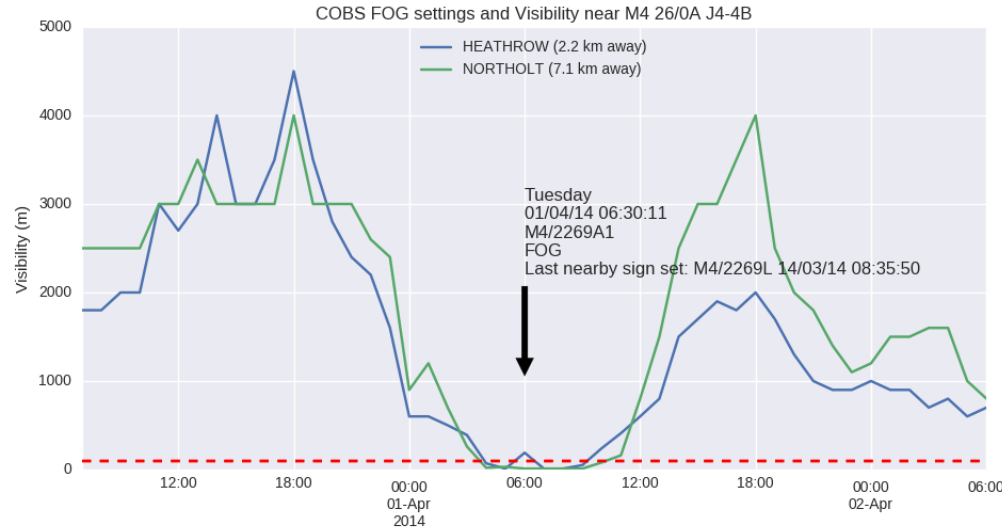
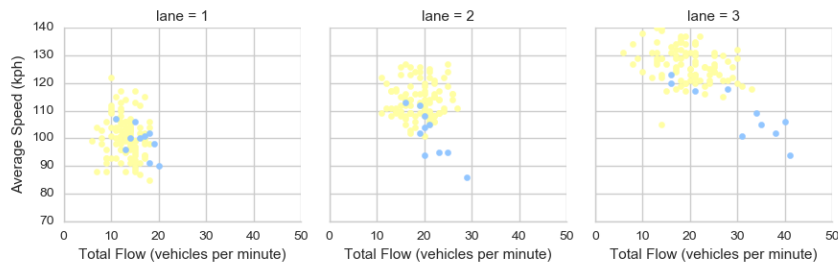
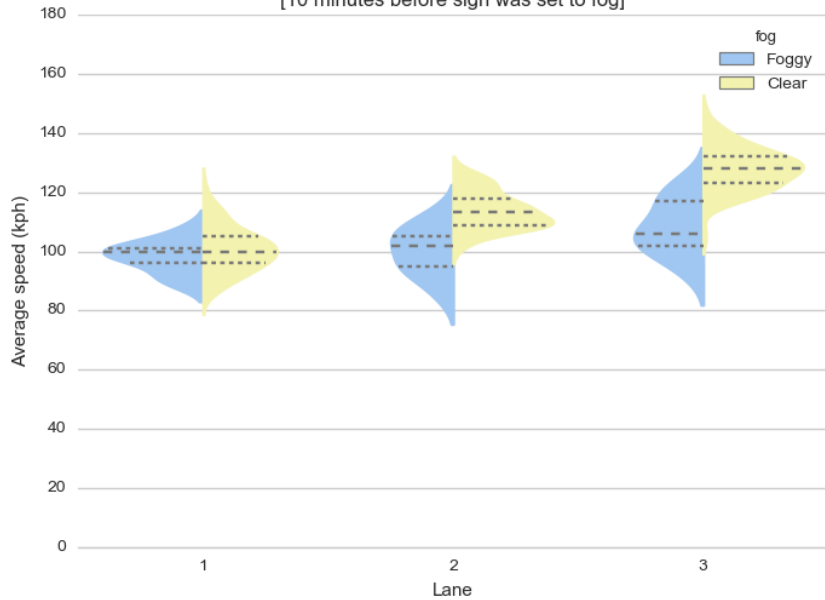
# OUR ACTIVITIES

- R&D projects
- Training courses
- Knowledge exchange and networks, e.g.
- Demonstrator projects
  - **Unique feature of IEA**
  - Short projects (ca. 3 months) to break down a barrier or explore a new technique
  - Can bring in academic expertise from Reading and elsewhere
  - Other IEA partners can join in and make contributions

SP4CE  
CLIMATE

# FOG PREDICTION (WITH HIGHWAYS ENGLAND)

M42\_6277B (2013-09-25 07:02:28 to 2013-09-25 07:12:28)  
[10 minutes before sign was set to fog]





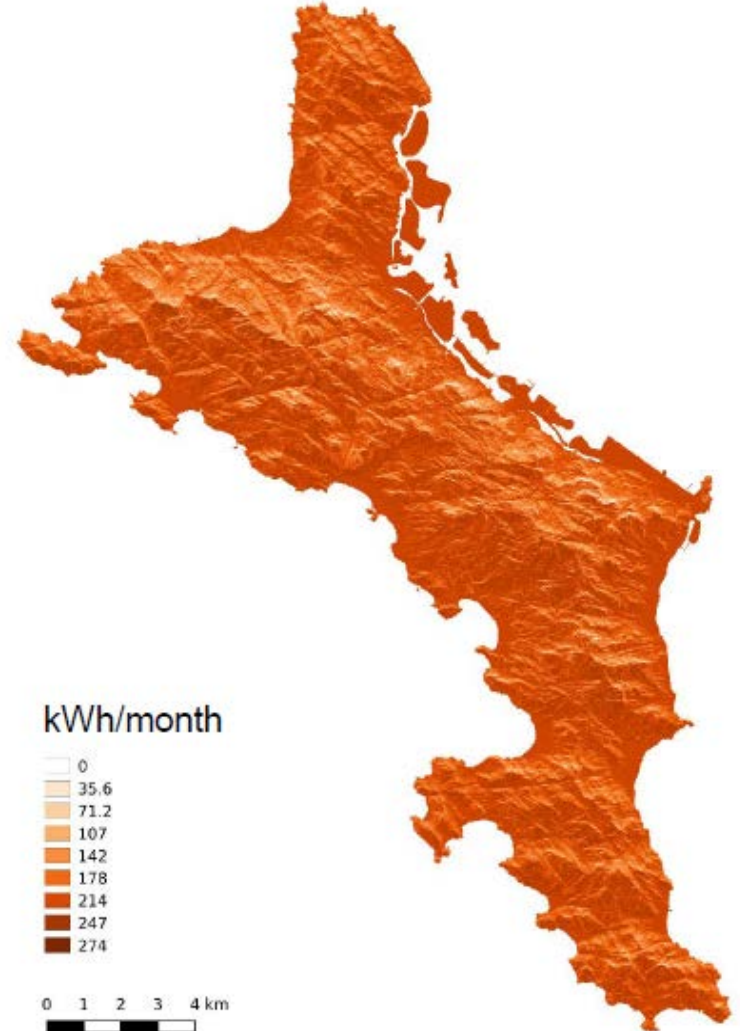
# RENEWABLE ENERGY ASSESSMENT TOOL



Empowered lives.  
Resilient nations.



**UK SPACE**  
AGENCY



# LAND USE CHANGE DETECTION USING SATELLITE DATA IN THE THAMES ESTUARY

## EA Thames Demonstrator

Case Studies	Data Layers
Optical Satellite Resolution	
Optical Satellite Classification	
Optical Classification Confidence	
Optical Change Detection	
Radar Change Detection	
Wood Wharf Case Study	
Nine Elms Case Study	

### Optical Satellite Comparison

We start by looking at some difference sources of optical imagery. Optical instruments detect visible light (and sometimes infra-red too) reflected from the Sun. Here the data have been processed to simulate 'true colour' images. You can see the difference in spatial resolution between three data sources: Sentinel 2 (top-right, 10m resolution), Deimos 2 (bottom, 10m resolution) and the WorldView 3 (top-left, 1m resolution) satellites

The Sentinel product is free to use with global coverage, and new imagery is collected routinely every few days at a given location. The higher resolution products are commercial and imagery may not be available everywhere, since the satellite must be explicitly 'tasked' to collect images. However, commercial imagery is frequently collected over large urban areas like London and so we were able to obtain data samples from archives.



## EA Thames Demonstrator

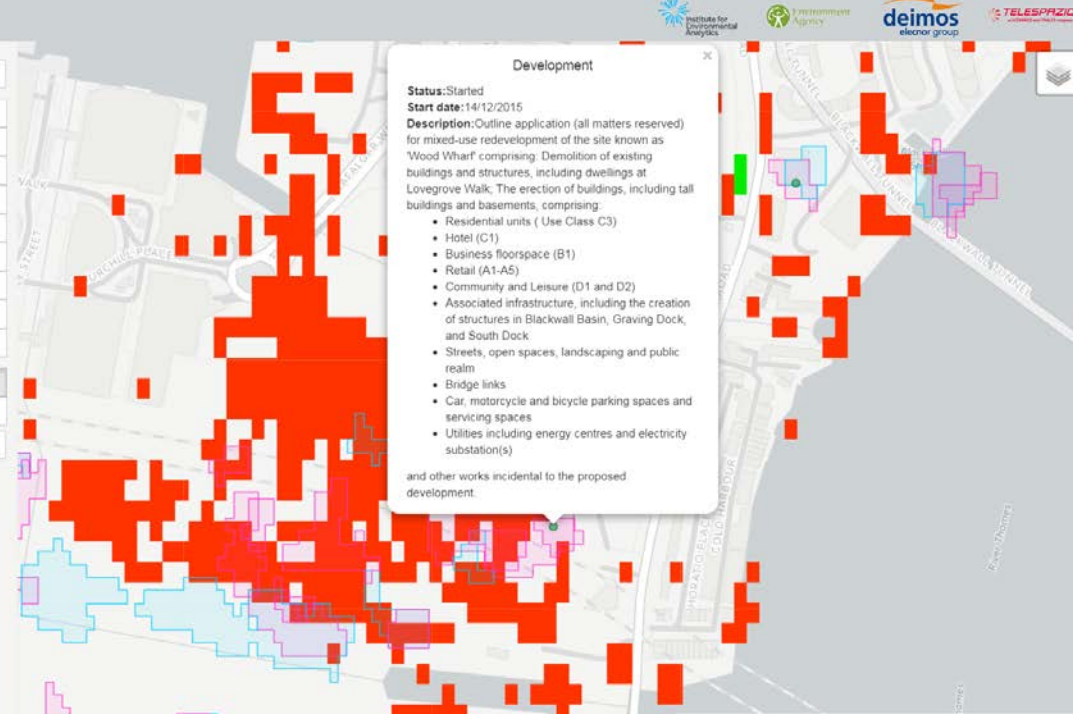
Case Studies	Data Layers
Optical Satellite Resolution	
Optical Satellite Classification	
Optical Classification Confidence	
Optical Change Detection	
Radar Change Detection	
Wood Wharf Case Study	
Nine Elms Case Study	
Ancillary Datasets	
Exploring the Data	

Changes	
Classification	
Classification Confidence	Change Confidence

**Radar Changes:**  
■ Buildings → Vegetation  
■ Vegetation → Smooth

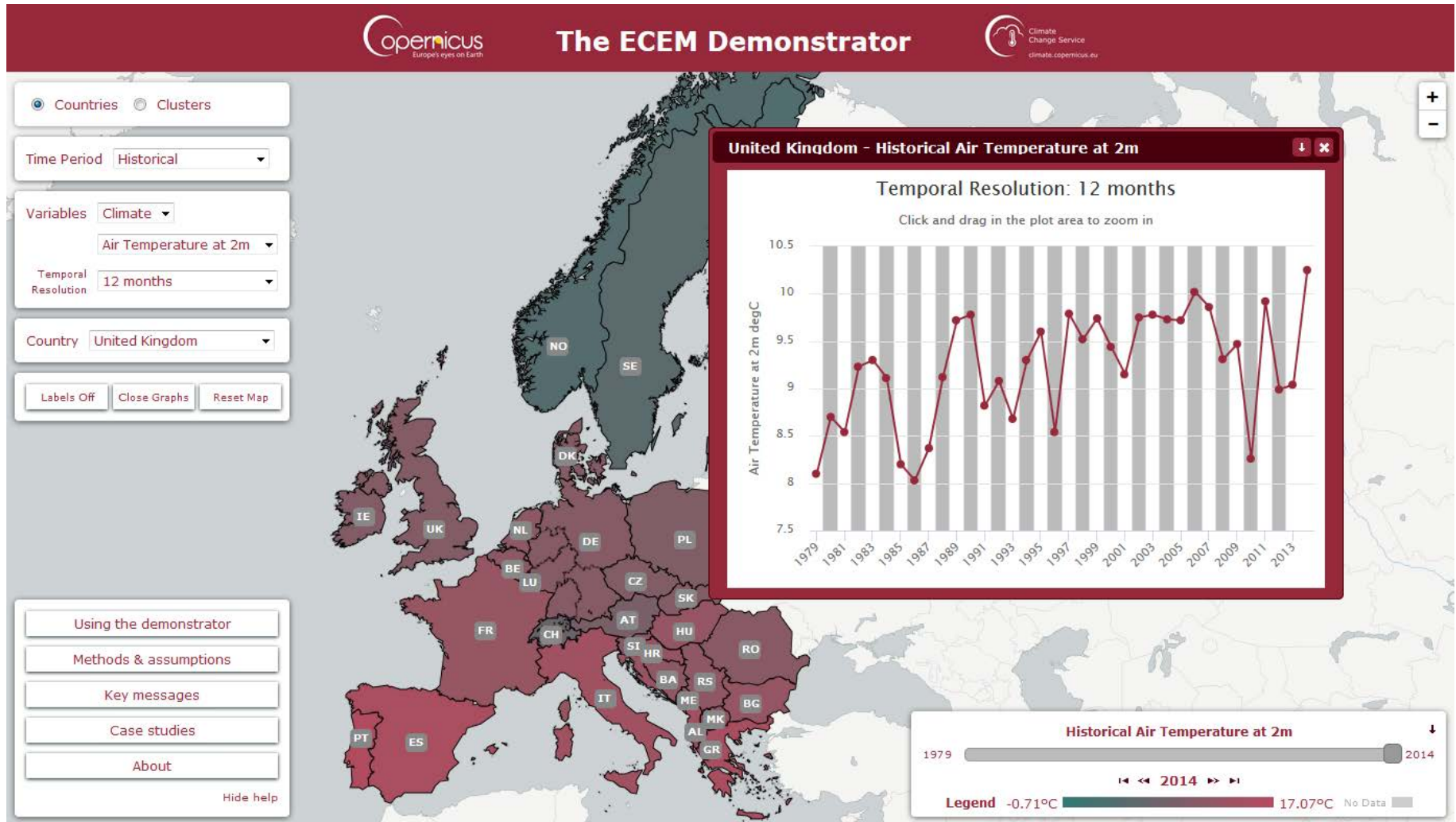
### Wood Wharf Case Study

By combining methods, we can detect real changes. Here development started 14/12/2015, as can be seen by the entry in the London Development Database (green dot). Optical detection shows that soil went to urban, and radar shows lots of tear down and build-up. 25/03/16 → 04/05/16 is happening on the ground.





# EUROPEAN CLIMATE ENERGY MIXES





# CLIMATE CHANGE INITIATIVE OPEN DATA PORTAL

cci

→ OPEN DATA PORTAL

A single point of access to ESA climate data.  
Open. Free. Easy.

[cci.esa.int/data](https://cci.esa.int/data)

ESA and its Member States have developed the Climate Change Initiative (CCI) to help address issues related to our changing world. The programme has produced robust, long-term, global satellite observations that are free for anyone to use.

Aerosol | Cloud | Fire | Greenhouse Gases | Glaciers | Greenland Ice Sheet | Antarctic Ice Sheet  
Land Cover | Ocean Colour | Ozone | Sea Ice | Sea Level | Sea Surface Temperature | Soil Moisture

# IEA'S TECHNICAL TEAM



**Dr Jon Blower**

CTO



**Alan Yates**

Principal Consultant



**Dr Debbie Clifford**

Environmental Data Consultant



**Dr Ben Lloyd-Hughes**

Data Scientist



**Barbara Percy**

Software Developer



**Dr Neil Parley**

Senior Software Developer



**Dr Guy Griffiths**

Software Engineer



**Dr Sam Doolin**

Data Analyst

# HOW WE CAN WORK TOGETHER

- We can provide a route to wider use (or even commercialisation) of your outputs
  - Effective translation between academia and the “outside world”
  - Ideas for demo projects?
- We can help with visualization and software development
- Provide training, coming up at the moment are:
  - Software development for environmental scientists
  - EO for disaster risk reduction
  - Big Data and the Environment (open online course)





# THE INSTITUTE FOR ENVIRONMENTAL ANALYTICS

Thank you

[www.the-iea.org](http://www.the-iea.org)

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