

# Sphere

Environment Systems Newsletter

Winter 2016

## Welcome

There's lots to report in this issue of Sphere. We have a new service arm, focusing on Data Services, we've been out and about speaking at various conferences and attending workshops. There's news too of an ecosystem services project for Natural Resources Wales and an update on our continuing LPIS work in Turkey. [editor@envsys.co.uk](mailto:editor@envsys.co.uk)

## Data Services



Sentinel 1 over Italy - photo ESA/DLR

Our work relies heavily on data. There are many sources of data available, and anyone familiar with our work knows that we use a lot of Earth observation data from satellites. We take the data, mash it up, make maps and provide the evidence and insight that our clients need to aid in their decision making. The recent availability of free and open data from Copernicus, the world's largest single Earth observation programme commissioned by the European

Commission in partnership with the European Space Agency (ESA), is a game changer. Not only is it a valuable source of data for our consultancy projects but it also opens up other opportunities that will enable Environment Systems to pivot, at will, from consultancy to data services.

The rich vein of Copernicus' Sentinel data comes in a variety of wavebands, and some of the satellites in the constellation are already passing over the same point on the Earth's surface at regular intervals. Sentinel 1 has a radar capability that can 'see' through cloud making it possible to image the whole of Europe every six days and the entire surface of the earth every twelve days. The applications for Sentinel data are endless but the challenge is to make it easily available, and then to add additional value in a number of different ways.

To make the most of the free and open Sentinel data, we will soon be offering a solution that will enable Environment Systems to deliver Sentinel-based environmental and agricultural indices, spanning the whole of the UK. This service supplies data in an open

standard format, with ISO 19139 compliant metadata. These data products will be highly relevant for policy makers, land managers and the agri-industry. We expect to go live in early 2017 with both free and subscription based products and are on the lookout for early adopters, so please get in contact if you would like to get involved!

### Recognition for Avon Wildlife Trust

Avon Wildlife Trust has won the Dame Mary Smieton Research Award 2016, which is administered by the Wildlife Trusts, for its State of Environment and My Wild City mapping and associated project work. Environment Systems is proud to have been closely involved in this work and of the recognition it has received.

*"The Wildlife Trust's Strategic Development and Research Committee, felt that your research into ecological network and ecosystem mapping in Bristol and across the West of England was of a very high quality and of potentially great significance to the movement."*

## Environment Systems Talks

Environment Systems has been invited to present at a number of events in recent months. It's nice to see that we are in demand!

Elsa-Kristin Naumann attended and spoke at a Spatial Ecology and Conservation Conference that took place at Bristol University in July. Elsa's presentation 'Ecosystem services mapping for decision making' focused on our work for the West of England Nature Partnership (WENP) and the Bristol My Wild City project. The West of England Nature Partnership needed a new way of considering land use in order to address a number of ambitious land use policies, whilst protecting and possibly enhancing existing biodiversity. Ecosystem service maps allow the ecosystem approach to be built into plans at an early stage. Elsa showed how maps can be used to highlight opportunity space and existing high-value habitats. It demonstrates that an ecosystem service view can maximise benefits when considering changes in land use.

Jamie Williams was in Madrid recently presenting at the Open Data Accelerators (IODC2016) Event. The event focused on

existing open data accelerators and incubators in Europe and showcased some of the startups. Jamie's presentation looked at the concept of providing non-specialists with access to high quality, near real-time satellite derived environmental data through a cloud based service. The service would deliver Sentinel based data using a number of revenue models and include a free baseline offering.

Neil Parker presented at the recent CIEEM Autumn Conference in Nottingham. In his presentation 'Why freely available Sentinel satellite data is a game changer for supporting integrated land management' Neil spoke about the need for integrated land management using an 'Ecosystem Approach' and how the advent of Sentinel satellite data and advances in remote sensing could help plug the data gaps to make this possible. He explained how our ecologists who specialise in taking an ecosystem approach are working closely with our remote sensing scientists to deliver just that. This approach can help with spatial planning, deal with natural flood management and water quality issues, improve ecological



networks, inform Local Biodiversity Action Plans and Green infrastructure planning plus deliver ecosystem services assessments.

Steve Keyworth was a keynote speaker at the recent Farmers Union Wales (FUW) Wales Farm Conference, which took place in Buiith Wells on the 6th of October. The theme of the conference was 'Opportunities for Growth Post Brexit.' Steve spoke about the work Environment Systems has been doing in agriculture, focusing specifically on the ways in which satellite remote sensing can help monitor crops within the growing season. Following the talk there was a lively panel session with the audience getting very engaged with views on the changes that are coming following Brexit.

# Spatial Analysis for Area Statements

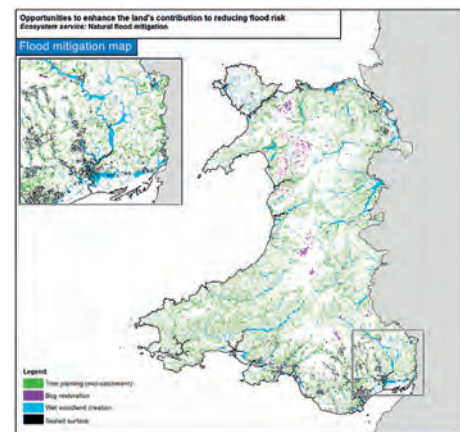
Earlier in 2016 Environment Systems was involved in a pilot mapping project for Natural Resources Wales (NRW) as part of its SoNaRR (State of Natural Resources Report) initiative. SoNaRR aims to be the first country-wide assessment of the health and resilience of ecosystems and the first assessment of the extent to which Wales is sustainably managing its natural resources. SoNaRR will also confirm the link between natural resources and the 7 well-being goals set out in the 'Well-being of Future Generations (Wales) Act 2015.'

SoNaRR requires specialist spatial analysis of natural resources and ecosystems, in terms of both ecological resilience and the ecosystem services received from them. Under the new Environment Act there is a requirement for regional Area Statements to set out information to help people implement the Welsh Government Natural Resources policy. Following the pilot earlier this year, Environment Systems and its partners are about to embark on the next

phase of work to expand the required spatial analysis element of this work. We will be producing a framework and contribute to the Area Statements through the use of a number of defined use cases and scenarios to assess the resilience of natural resources and the opportunities for their management when faced with a range of threats. The methodology applied to the Area Statement spatial analysis starts from the basic premise that every parcel of land (or water) in Wales exerts an influence on every ecosystem service delivered. This is based on four main factors:

- The land cover or habitat type and its condition
- The geology and soil type underlying the land
- The landscape context (e.g., on a steep slope or valley bottom)
- How it is managed, i.e. none at all, little, intensive, extensive

This is an approach we have been pioneering elsewhere both in the UK and Ireland.



Flood mitigation map from the SoNaRR pilot study

Rather than focus on any one tool for the production of a specific set of maps, this project will seek to identify and formulate a framework that will help decision makers to take a holistic, ecosystem approach to the environment and to highlight the most beneficial, current options available to them.

## TURKEY'S LPIS



Typical Turkish landscape, just outside Ankara

Environment Systems has provided one of four 'experts' for the external quality control of a project to create a Land Parcel Identification System (LPIS) for Turkey. The project has now reached a critical stage. A complete set of orthophotos has been provided for the whole of Turkey, forming a huge dataset of over 50,000 individual images and almost one petabyte of data.

A team of over 200 digitisers is working with the orthoimagery in a huge exercise to create a seamless geodatabase of reference parcels (agricultural blocks) covering the whole of Turkey's agricultural surface and non-agricultural areas, in total almost 784K sq km. It is the single largest land cover digitising exercise in the whole of Europe.

Our man on the ground, Chris Finch, is working in a small External Quality Control team (EQC), whose role is to ensure that the data provided meets EU JRC criteria for the quality requirements for

an LPIS. The work involves evaluating a sample of all reference parcels digitised across the whole of Turkey, including automatic, thematic and visual controls.

Turkey is a huge and agriculturally diverse country. There is a large arable and cereal sector (including rice and tobacco), major citrus fruit, wine and olive production, and with large areas of nut (hazelnut, walnut, almond and pistachio) and tea production. There are also extensive high biodiversity grasslands and forests. Mapping and classifying this diversity presents many challenges, especially within a limited timescale, and provides Environment Systems with a set of unique skills ideal for future land cover digitising projects anywhere in the world.

## OGC and ODI

In line with our move into Data Services Environment Systems has recently joined the Open Geospatial Consortium (OGC) and the Open Data Institute (ODI).

The OGC is an international not-for-profit organisation committed to creating open standards for the global geospatial community. These standards are arrived at through a consensus process and are freely available for anyone to use to improve sharing of the world's geospatial data. OGC standards are used in a wide variety of domains including Environment, Defence, Health, Agriculture, Meteorology, Sustainable Development and many more. We have already attended OGC domain workshops in Dublin and Orlando.



The ODI (Open Data Institute) was co-founded in 2012 by the inventor of the web, Sir Tim Berners-Lee and AI expert, Sir Nigel Shadbolt to bring open data's benefits to specific areas of society and industry. The ODI is an independent, not-for-profit, non-partisan company headquartered in London. ODI has an international reach, with thousands of members, thousands of people trained and dozens of startups incubated. The ODI brings together commercial and non-commercial organisations and governments around specific sectors to address today's global challenges, helping people identify and address how the web of data will impact their businesses and their sectors.

