Flooding Forecasting & Mapping

Media headlines this week have shouted that the UK is in for a sizzling summer with temperature in the nineties, coupled with potential flooding in August due to the La Niña weather process.

The headlines were based on the UK Met Office's three month outlook for contingency planners. Unfortunately, when we looked at the information ourselves it didn't exactly say what the media headlines claimed! The hot temperatures were just one of a number of potential scenarios for the summer. As any meteorologist will tell you, forecasting a few days ahead is difficult, forecasting a three months ahead is highly complex!

Certainly, La Niña is likely to have an influence. As we've previously written, this year has been influenced by a significant El Niño where there are warmer ocean temperatures in the Equatorial Pacific. La Niña is the opposite phase, with colder ocean temperatures in that region. For the UK this means there is a greater chance of summer storms, which would mean more rain and potential flooding. However, there are a lot of if's!

At the moment our ears prick up with any mention of flooding, as Pixalytics has just completed a proof of concept project, in association with the Environment Agency, looking to improve operational flood water extent mapping information during flooding incidents.

The core of the project was to implement recent scientific research published by Matgen et al. (2011), Giustarini et al. (2013) and Greifeneder et al. (2014). So it was quite exciting to find out that Laura Guistarini was giving a presentation on flooding during the final day of last week's ESA Living Planets Symposium in Prague – I wrote about the start of the Symposium in our previous blog.

Laura's presentation, An Automatic SAR-Based Flood Mapping Algorithm Combining Hierarchical Tiling and Change Detection, was interesting as when we started to implement the research on Sentinel-1 data, we also came to the conclusion that the data needed to be split into tiles. It was great to hear Laura present, and I managed to pick her brains a little at the end of the session. At the top of the blog is a Sentinel-1 image of York, overlaid with a Pixalytics derived flood map in red for the December 2015 flooding based on the research published by Laura

The whole session on flooding, which took place on the last morning of the Symposium, was interesting. The presentations also included:

- the use of CosmoSkyMed data for mapping floods in forested areas within Finland.
- extending flood mapping to consider Sentinel-1 InSAR coherence and polarimetric information.
- an intercomparison of the processing systems developed at DLR.

- development of operational flood mapping in Norway.

It was useful to understand where others were making progress with Sentinel-1 data, and how different processing systems were operating. It was also interesting that several presenters showed findings, or made comments, related to the double bounce experienced when a radar signal is reflected off not just the ground, but another structure such as a building or tree. Again it is something we needed to consider as we were particularly looking at urban areas.

The case study of our flood mapping project was published last week on the Space for Smarter Government Programme website as they, via UK Space Agency, using the Small Business Research Initiative supported by Innovate UK, funded the project.

We are continuing with our research, with the aim of having our own flood mapping product later this year – although the news that August may have flooding means we might have to quicken our development pace!