NEWSLETTER NO. 6

First and foremost, the TRUSTEE family is happy to welcome two new ESRs - Maria Culman from Colombia (ESR11) and Juan Quiros from Costa Rica (ESR7). Maria is based in VITO (Belgium) and will work on using remote sensing for the estimation of pear and palm tree biomass (link to bio). Juan, based at the Julich research centre (Germany), is focusing on chlorophyll fluorescence retrievals (link to bio). Now we are the dozen again!

It was these two partners - VITO and Julich - who organized the second TRUSTEE Summer School, which focused on providing the ESRs with practical applications for the remote sensing of vegetation.

Summer School 2 - Remote sensing for traits mapping in agriculture
Held in Forschungszentrum Jülich, Germany 2 – 3 May 2019

After a labour day dominated by travels, the ESRs managed to arrive at the *Forschungszentrum Jülich (FZJ)* to begin their summer course on crop phenotyping with remote sensing. The first day began with a series of lectures, with a warm welcome by Uwe Rascher (Jülich), who also introduced the ESRs to the institute of biogeosciences and plant science. The first talk discussed the different available networks and consorcias related to the field of phenotyping research, both at the national (i.e The German Plant Phenotyping Network -DPPN) and international (i.e.European plant phenotyping network - EPNN) level. Following this, Hendrik Poorter (Jülich) demonstrated a meta-analysis of plant response to light intensity and Shizue Matsubara (Jülich) explained how to understand photosynthetic traits under fluctuating light conditions. After lunch, Uwe Rascher (Jülich*)* and Onno Muller (Jülich*)* gave the ESRs a tour of their impressive facilities. This included visiting the greenhouse, which is equipped, among many other things, with simple and stereo-cameras for root architecture observations, rhizotrons and magnetic tomographs for below ground observations and a robot that allows for automated seeding, which had been adapted to work with small seeds, such as with *Arabidopsis'*.

The second day was devoted to field and practical work at the Kampus Klein-Altendorf. The ESRs were split into three groups with each taking measurements of photosynthetic indicators at different scales within an experimental barley field. The first group took leaf level measurements using the Pulse-Amplitude-Modulation (PAM) chlorophyll fluorometer and the leaf handheld spectral reflectance instrument PolyPen. The second group acquired canopy level measurements with a laser induced fluorescence transient (LIFT) fluorometer. The third team flew a drone equipped with a multispectral sensor for a landscape level measurement. Subsequently, each group processed and analyzed their acquired data, which were then inter-compared to investigate for any spatial or scale dependent differences.

Here some photos of the field work

Thematic Workshop 3
Held in KU Leuven and VITO Leuven, Belgium 6 – 9 May 2019

After the fruitful days in Jülich, the ESRs hopped onto a bus and crossed the border to Belgium. They stayed in Leuven, where they were hosted by Stephanie Delalieux (VITO) and Ben Somers (KU Leuven). In KU Leuven, during the morning, the ESRs got a chance to update each other with the latest progress of their research. Later in the afternoon, Roberta Pattono (European Commission), via video conference, gave them an overview of the EU support for gender equality in research and innovation and shared some statistics. This talk was then followed by an interesting talk by Hilke Oetjen (Eurpean Space Agency), who spoke about her personal trajectory and experience for women in Space Sciences. In the final session in KU Leuven, the ESRs got a hands-on session and demo on the multiple endmember spectral mixture analysis (MESMA) algorithm available as a QGIS plugin.

The next day, the ESRs left Leuven and went on to visit the PcFruit installations, where Serge Remy (PcFruit) gave a guided tour of their field site, demonstrating experimental gardens and precision horticulture. The ESRs even got some hints and tricks on how and when to cut their own pear tree to get decent harvest! Yasmin Vanbrabant (KU Leuven) proceeded to present some application of drones to predict pear orchard flowering.

Subsequently, the ESRs travelled to VITO, Flemish institute for technological research, located in Mol, Belgium, where they first got a tour of their impressive facilities, which included their drone lab and the satellite Proba-V ground segment department. Following this, lectures

were given on airborne and UAV surveys (Bart Bomans), airborne data processing (Kristin Vreys and Daniel Lordache) and UAV data processing (Klaas Pauly).

The ESRs visiting VITO's facilities

The following day started with a workshop on Marie Skłodowska-Curie Actions proposal writing and ended with, arguably the most exciting part of the training , an excursion to the digital potato farm of Van den Borne. The extravagant farmer, who is famous in the Netherlands for having his own airport just to be able to fly his numerous drones, popularly explained what 'precision ag.' is.
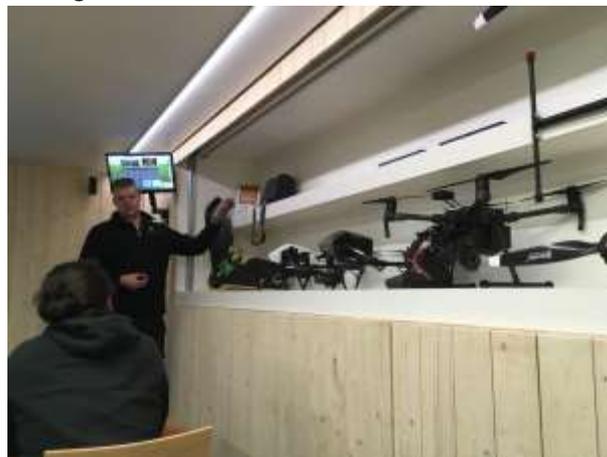
This is what precision agriculture looked like in the digital potato farm!

The final day of the training school, the ESRs got more practical with Terrascope and Jupyter notebooks where they learned about processing Sentinel-2 data using their cloud computing infrastructure. And of course, one last final dinner all together was organized to have a proper goodbye and send-off.

Living planet symposium.
Milan, Italy 13-17 May.

Right after the summer school Hafiz, Javier, Dominic, Khelvi, Anton, Egor and Vicente went to the Living Planet Symposium to present their exciting discoveries to the public.