



OSCARS

Open Science Clusters' Action
for Research & Society

Funded Project

Open and FAIR Integrated Phenology Monitoring System

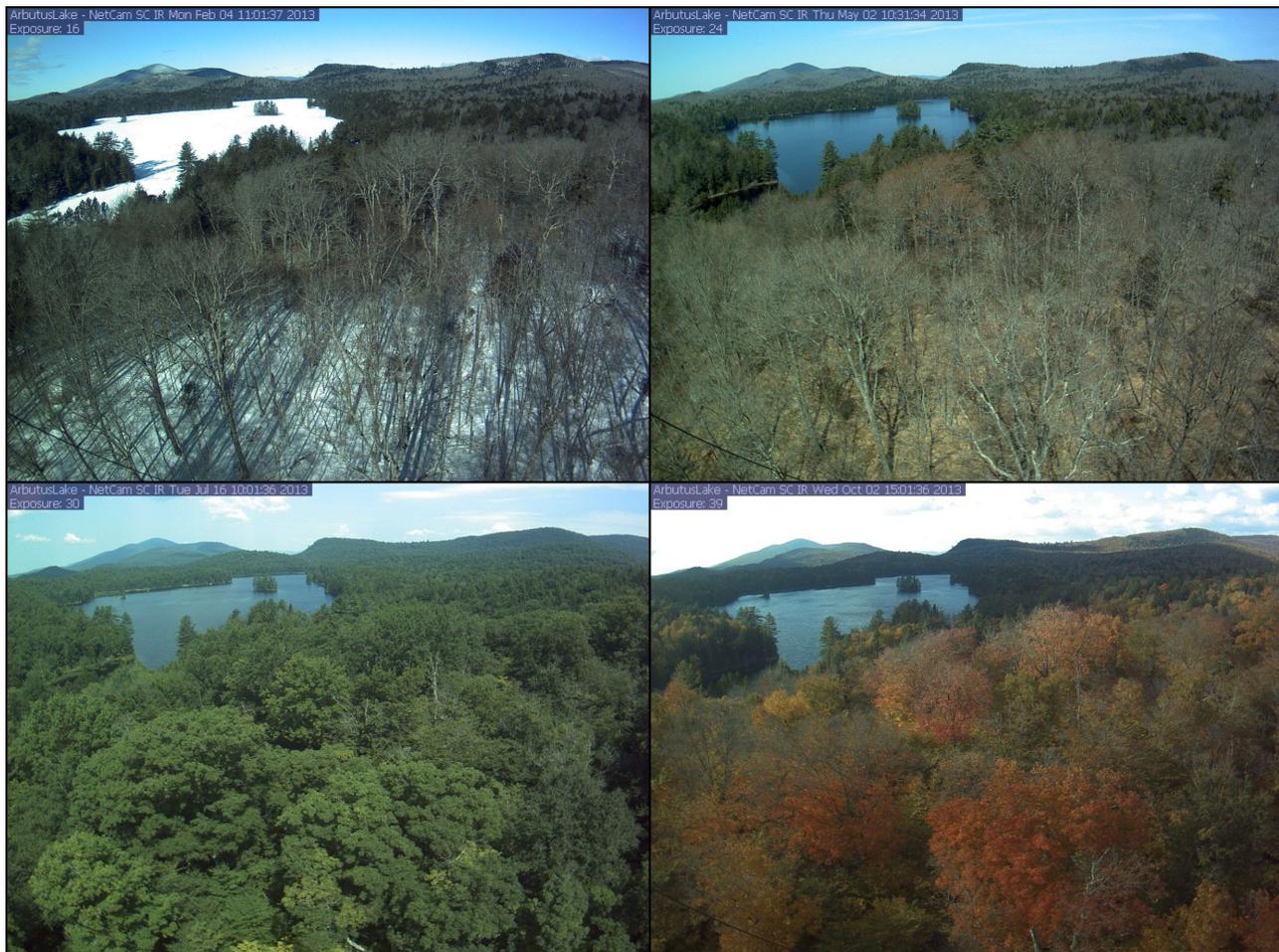
Presenter: Luca Cerato, Terrasystem

Implemented by



Funded by
the European Union

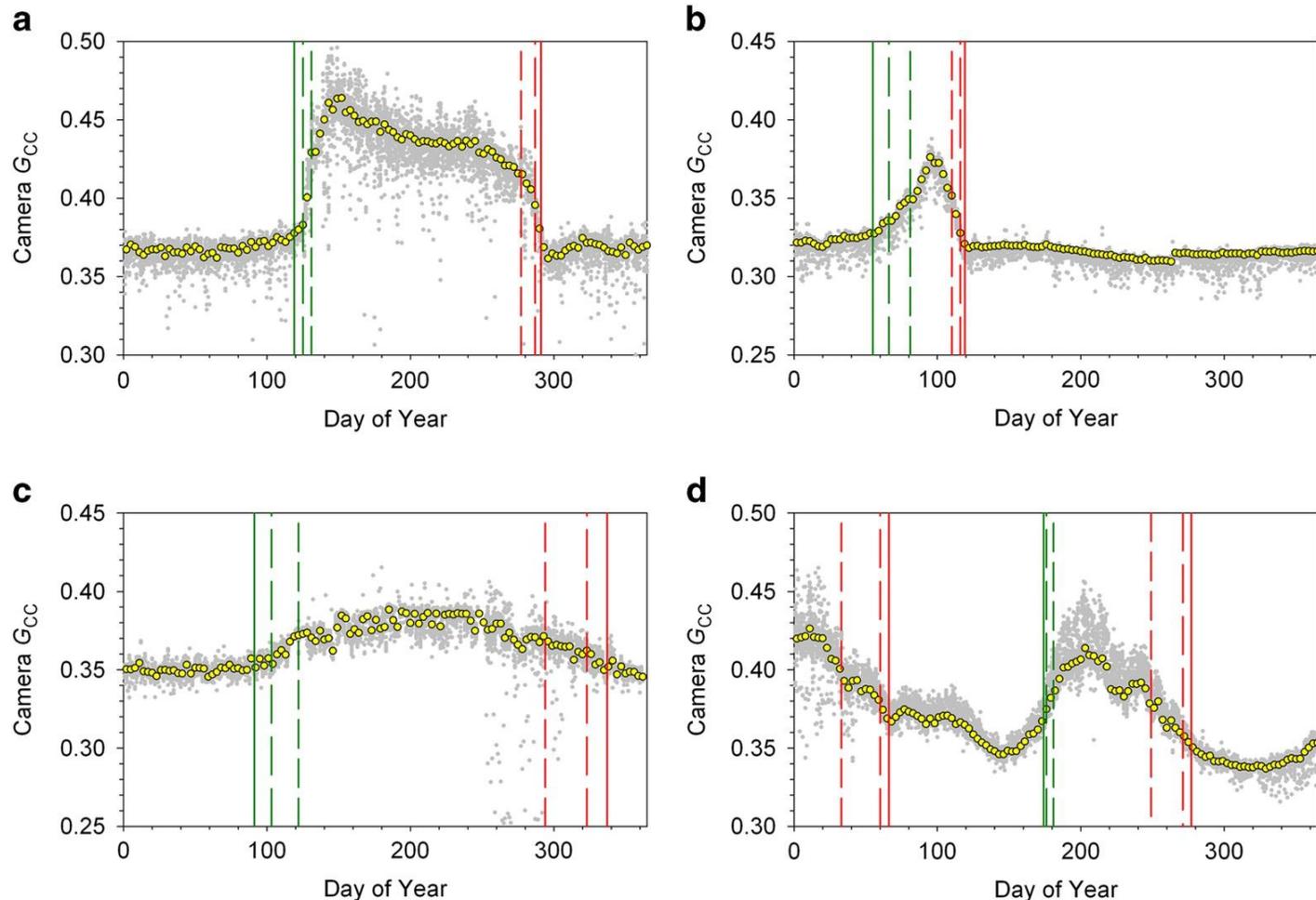
CHALLENGE ADDRESSED – WHAT IS PHENOLOGY



Phenology is the study of the timing of recurring biological events and how they are influenced by environmental conditions, especially climate

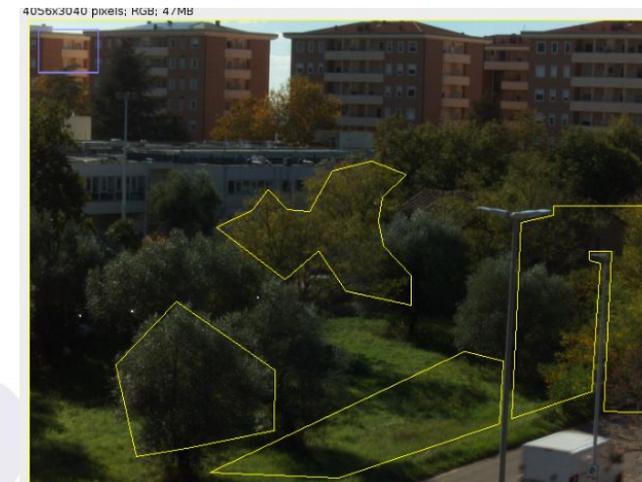
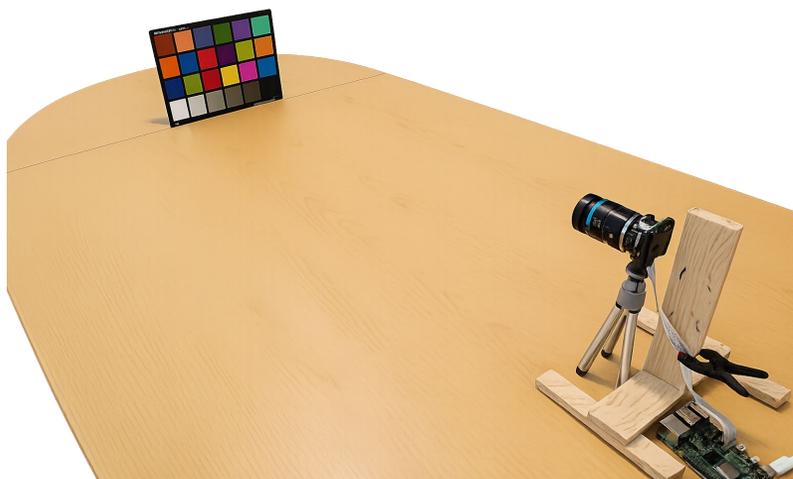
A series of PhenoCam images from February, May, July, and October 2013 at the Arbutus Lake site in New York. <https://doi.org/10.3334/ORNLDAAAC/1689>

CHALLENGE ADDRESSED – USE OF PHENOCAMS



- Can be monitored using cameras
- Global Network (~ 700 sites). Only 15% of sites are in EU, mainly ICOS and eLTER.

Richardson, A., et al. (2018). <https://doi.org/10.1038/sdata.2018.28>



- **Current standard cameras:** US-made, high cost, low flexibility, not designed for ecological monitoring.
 - **Developed open cameras:** open-source hardware & software with FAIR data management, low cost.
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SOLUTION – ICOS CARBON PORTAL



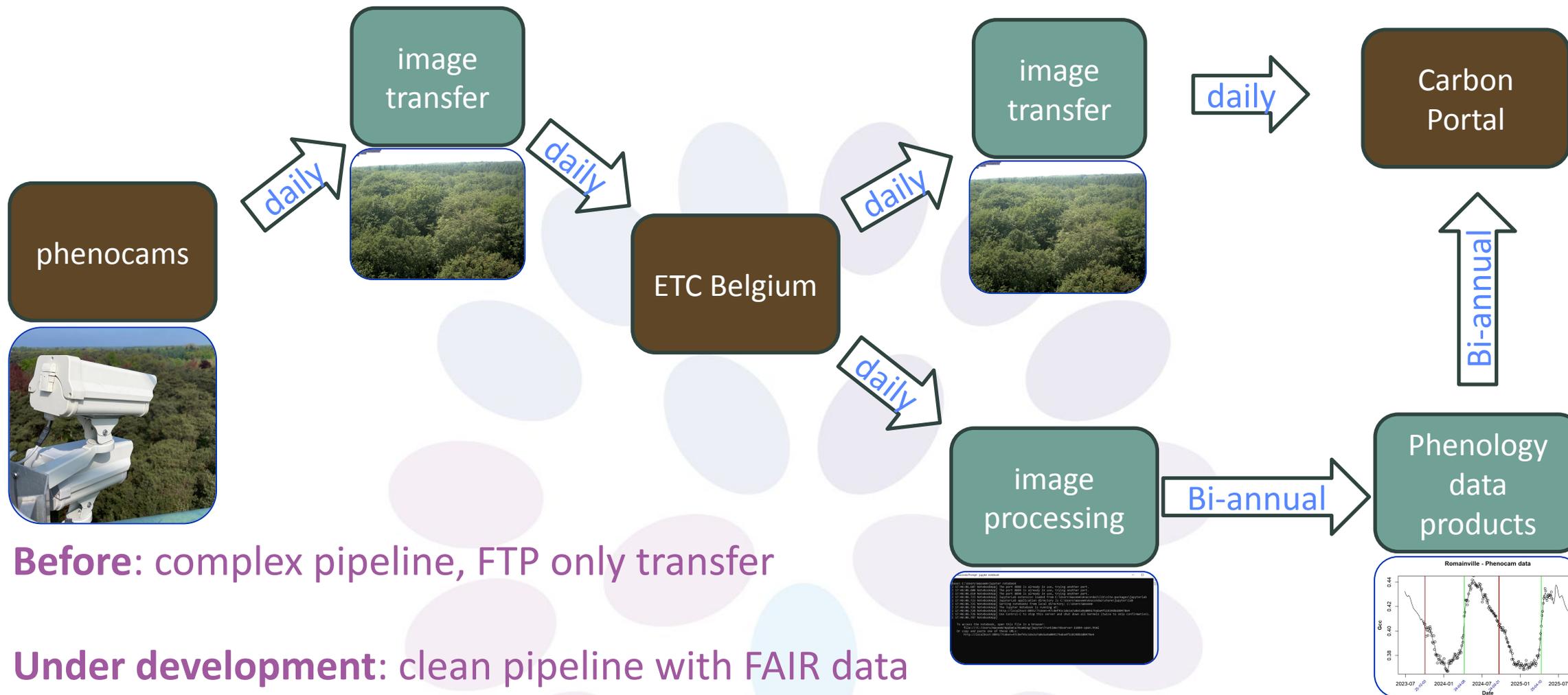
The screenshot shows the ICOS data portal interface. At the top, there is a navigation bar with links for 'ABOUT & CONTACTS', 'OBSERVATIONS', 'DATA & SERVICES', 'SCIENCE & IMPACT', 'RESOURCES', and 'NEWS & EVENTS'. Below this is a search bar and a 'Log in' button. The main content area is titled 'ICOS data portal Search, preview, download data objects'. On the left, there are filter options for 'Data origin', 'Project' (set to 'ICOS x'), 'Theme' (set to 'Ecosystem data'), 'Station of origin' (7 items), 'Station class' (set to 'ICOS x'), 'Ecosystem type' (5 items), 'Responsible country' (4 items), 'Data submitter' (5 items), and 'Sampling height (meters)'. On the right, there is a search results section showing 'Data objects 1 to 20 of 3438'. The results list several 'Daily phenocam image set from Hyltemossa' and 'Daily phenocam image set from Selhausen Juelich' entries, each with details on 'Phenology camera images' and 'Ecosystem data'.

ICOS Carbon Portal is now receiving daily images from a small set of ICOS stations, all equipped with the standard US made camera.



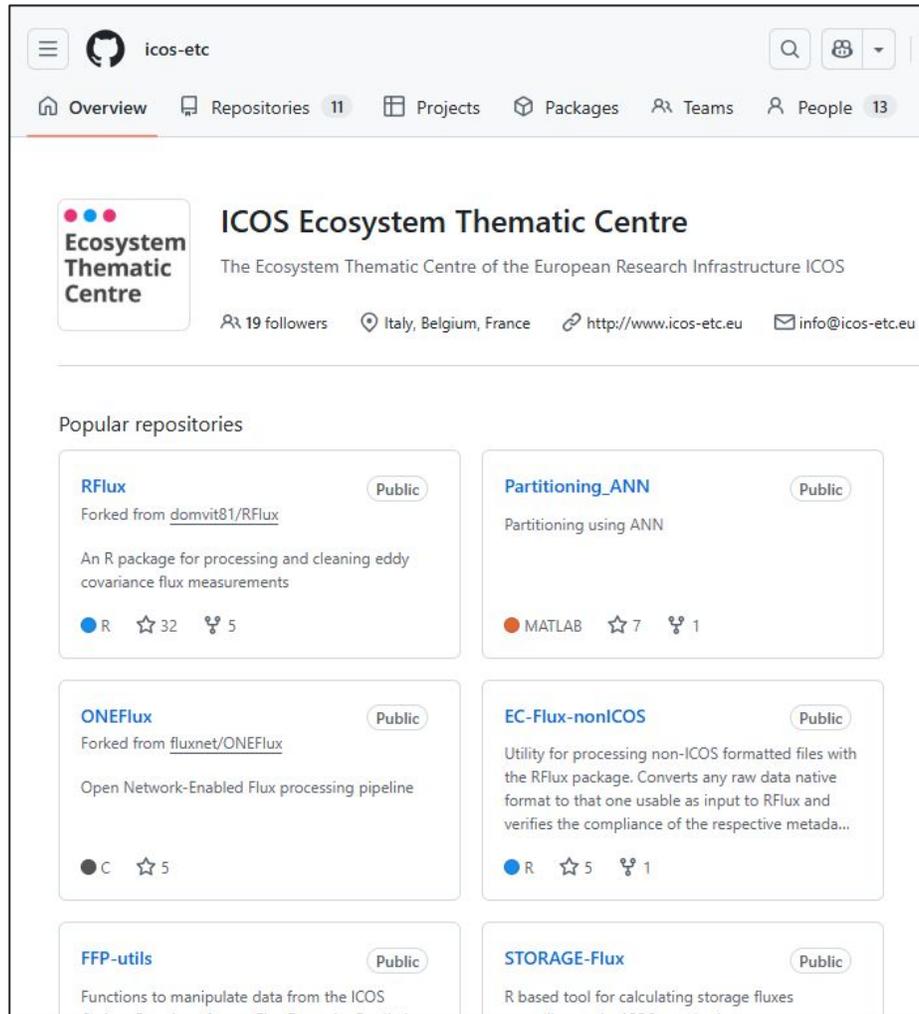
A new phenocam: activities led to the selection and design of a new camera for phenological observations. Prototype under finalization for final field test

RESULTS – IMPROVED PIPELINE



Before: complex pipeline, FTP only transfer

Under development: clean pipeline with FAIR data and secure protocols (sFTP, SSH)



The ICOS ETC GitHub will host:

- Code for the management of the new camera and (meta)data submission
- Code for the data processing and products preparation
- Design of the new camera

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