REPORT

Code Sprint "Citizen Science and Remote Sensing Data Integrated in the European Data Spaces"

On October 5th and 6th, CREAF hosted a two-day hybrid code sprint at UAB Casa Convalescència, in Barcelona. The goal was to test how remote sensing, in-situ and citizen-generated data can be made available in the European Data Spaces. We worked hands-on with the Minimum Viable Product (MVP) of the Green Deal Data Space (GDDS) recently deployed by the SAGE project. We used open, interoperable OGC standards throughout, including the SensorThings API and its STAplus extension, OGC API - DGGS and GeoDCAT-AP metadata.

The sprint was organised by CREAF with the support of the OEMC, SAGE, CitiObs and more4nature projects and the EuroGEO Action Group on the Green Deal Data Space, with co-funding from the European Union. It took place just before the OEMC Global Workshop 2026 held at the same venue and also co-organized by CREAF.

Participants split into three thematic teams: Team Data Space, Team Citizen Science, and Team DGGS. Both days alternated breakout sessions and practical work with short plenary moments, so teams could share progress and coordinate.

Team Data Spaces

The Team Data Spaces worked with the resources part of the GDDS Minimum Viable Product (MVP) deployed by SAGE extended with the multi-tenant infrastructure operated by Poznań Supercomputing and Networking Center (PCSS). The team started with an introduction to how data spaces work, what the GDDS MVP can do today, and the two clients: the Eclipse Dataspace Components (EDC) dashboard developed by PCSS recently updated to a multi-tenant version of the Eclipse Data Connector, and the alpha version of the ezDataSpace JavaScript library developed by CREAF. It then split into several subgroups with a clear goal: learn to onboard new tenants in the data space, publish an asset, define a policy (or policies), and attach a contract so it became visible in the federated catalogue. Ultimately, the goal was to test the access and download of assets registered in one connector from other connectors.

On the first day, participants set up four new virtual connectors and created their first assets. On the second, several new participants were onboarded. Each of them now manage its own connector and dashboard, the entry point that lets an organisation publish and request data in the data space.

The team also put the rules of the game to the test. They tried out common contracts, the agreements that define who can use a dataset and under which conditions, such as a limited time period, a geographical area or other specific access policies. Finally, participants downloaded data from connectors belonging to other participants. This showed that the full cycle works: publish a dataset, find it, agree on the terms and transfer the data from an organization where we do not belong and do not have a user account.

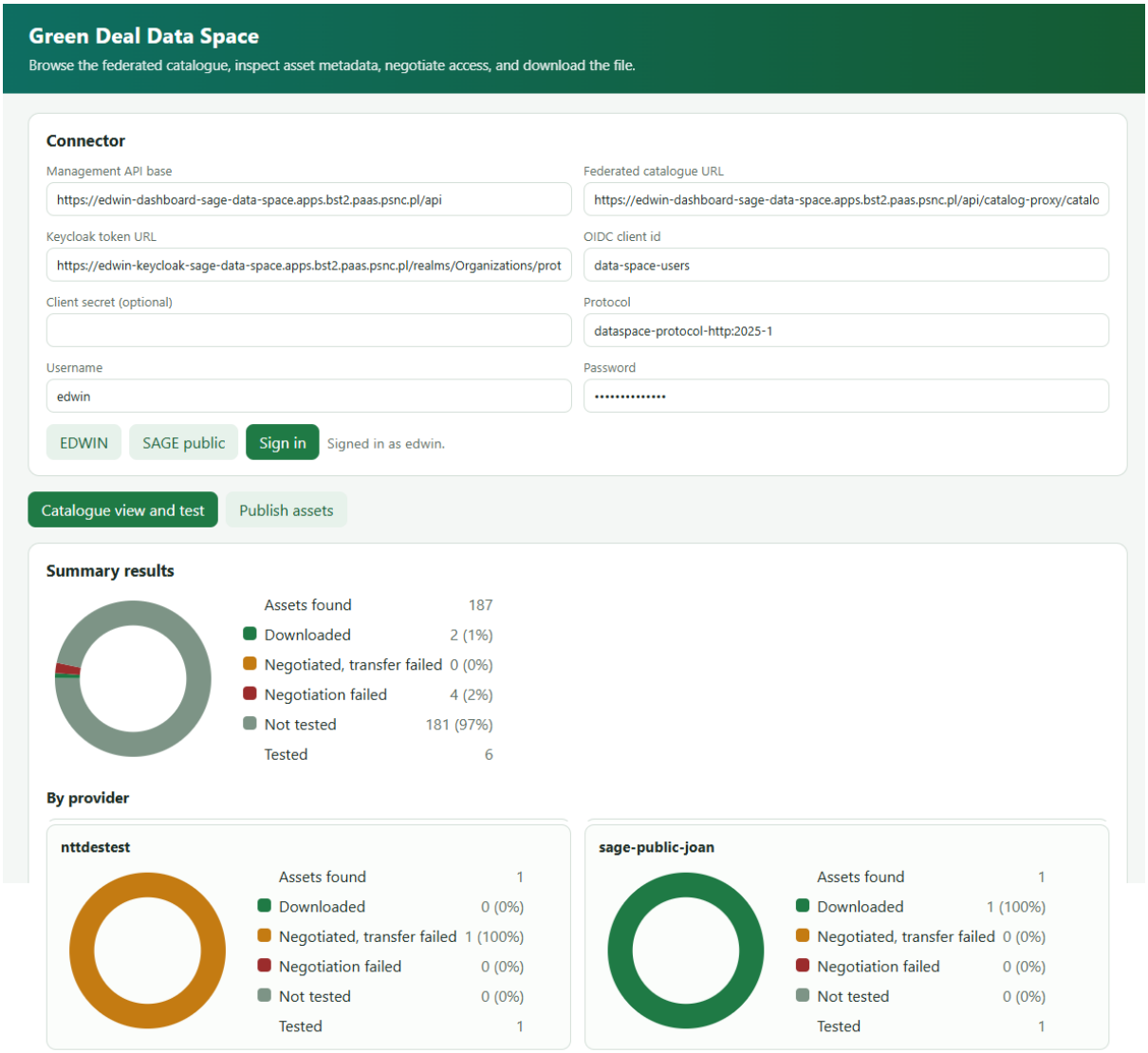


Image: Fragment of the ezDataSpace application tested and improved during the code sprint.

Team Citizen Science

This team worked with the tools developed in the CitiObs and more4nature project around the OGC SensorThings API standard including the Smart Citizen Kit (SCK), mobile sensors and TAPIS, the browser-based table viewer developed by Grumets. The team also explored STAplus, the new family of standards designed for Citizen Science data.

The team started with the basics: connecting sensors and testing a plug- in for QGIS to upload the data to SensorThings API services. Then they went a step further and reproduced the same workflow in TAPIS (www.tapis.grumets.cat), so anyone can read data straight from a sensor in a web browser, with no desktop software or plug-in needed. To experiment with STA requests along the way, they used the Talend API Tester.

Privacy got as much attention as the code. The team implemented the STAplus me() function so that a user's OAuth identifier is never published, in line with the GDPR. They were also honest about the

limits: compliance is possible thanks to the STAplus GDPR profile, but applying it in the everyday reality of Citizen Science projects is complicated.

The session also raised a familiar question. Standards are long and hard to sum up in a short time, so how do you convince others to adopt them? Artificial intelligence may be part of the answer: AI tools are trained with many documents including the OGC standards and can be challenged to use the existing implementations or implement new ones. But AI should not replace human knowledge. To be sure AI is not hallucinating, people still need to know the basics to judge, validate and interpret what AI produces.

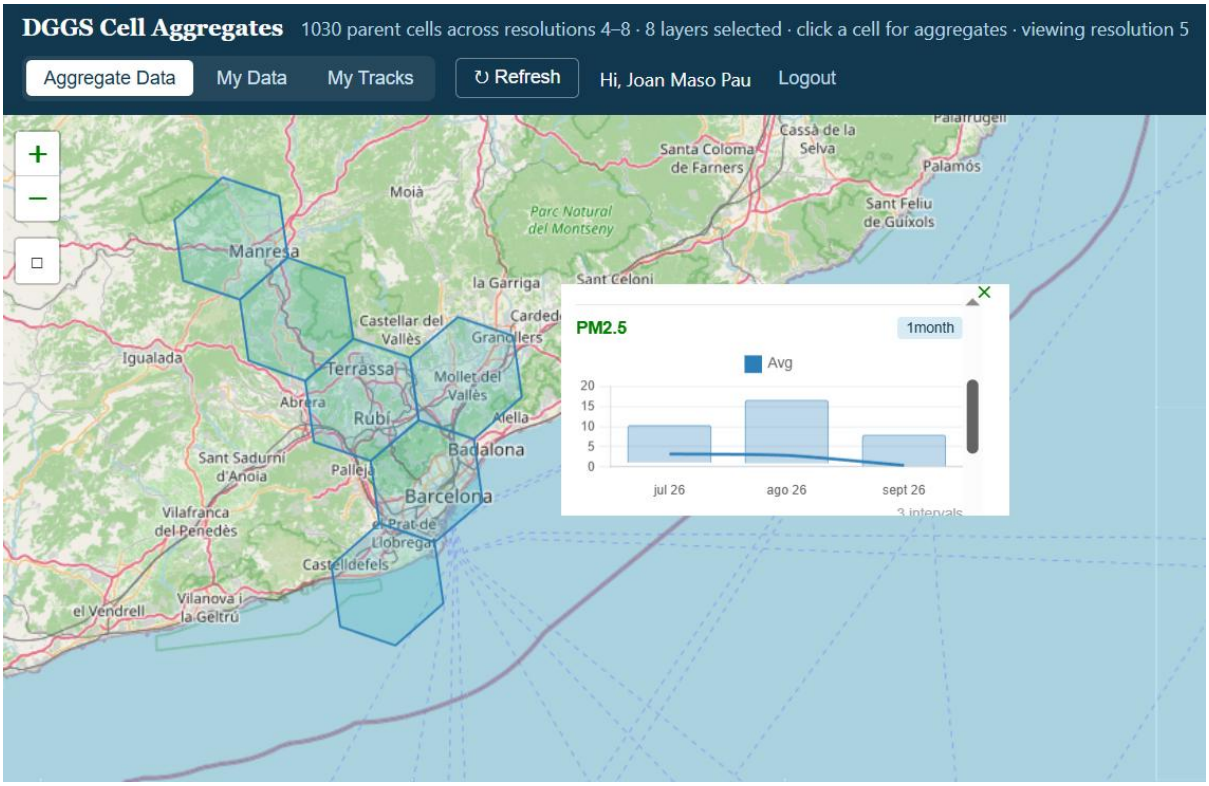


Image: Fragment of a map browser used as a tool during the code sprint.

Team DGGS

A Discrete Global Grid System (DGGS) divides the planet into a hierarchy of cells (a.k.a zones), a bit like a honeycomb that covers the whole Earth at different levels of detail. When satellite images, sensor measurements and statistics share the same DGGS, they can be combined almost instantly. This team explored what that means for environmental research, with a special focus on forests.

The starting point was a simple question: how useful is DGGS for forestry applications? The team weighed the advantages and drawbacks and outlined a use case with the SAGE Sweden use case that pairs grids with artificial intelligence models for prediction. One of the key ideas was that data prepared on a DGGS is especially well suited to training AI, and that datasets sharing the same time, area and resolution can be integrated on the fly. Not everything was easy: participants also ran into practical hurdles, such as converting polygons into DGGS zones and authenticating to access Sentinel satellite images.

On the technical side, CREAF demonstrated DGGS-DBF, a "cloud-optimised" approach that needs no dedicated server for serving DGGS zones in an optimal way: the browser simply downloads the pieces of data it needs. The team also presented the DGGAL library, and tested it in a Jupyter notebook that works with the Python implementation of if, and the first steps of the implementation of OGC API – DGGS standard in CREAF's MiraMon Map Browser were done. One demo showed population data for Catalonia on a global grid next to CitiObs citizen sensor layers.

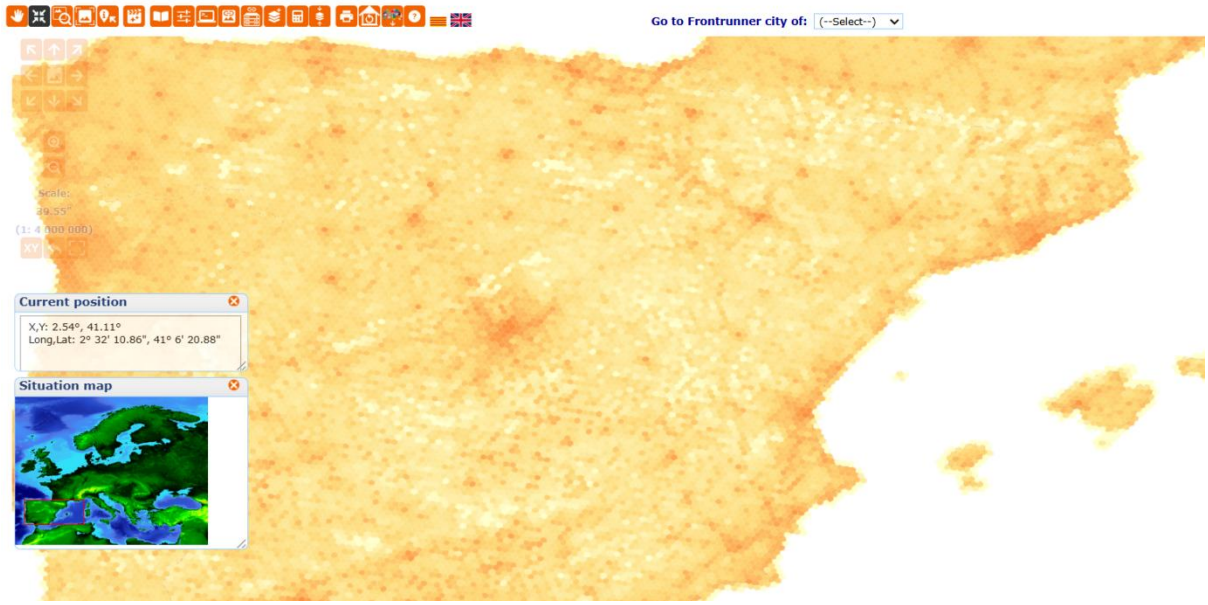


Image: Fragment of the MiraMon map browser with support to DGGS implemented during the code sprint.

More than code: why code sprints matter

Beyond the technical results, these two days were a reminder of why code sprints matter. When developers, data managers, researchers and citizen science practitioners sit at the same table with a shared technical challenge, things happen that are hard to achieve any other way. Those with more experience help those who are just starting, and unexpected connections appear, ideas are tested on the spot, and a common understanding is gained in an agile way. That spirit of collaboration is what turns two days of work into a real step forward. While we keep building on the topics opened in Barcelona, Codesprints Grumets is an instrument always open to new topics. If you have a challenge that could benefit from this way of working, we would love to hear from you!