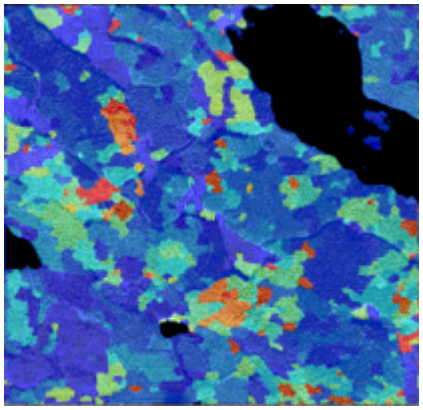


EducEO - Education for EO capitalizing on a Citizen Science approach

Timo Toivanen, Matthieu Molinier, Tuomas Häme
VTT Technical Research Centre of Finland

Project summary

- The EducEO project will:
  - **Evaluate** the state-of-the-art of Citizen Science related to Earth Observation, identify the key partners and networks, and assess potential new opportunities
  - **Demonstrate** the value of the Citizen Science for Earth Observation science, applications, education and citizen engagement through three pilot projects: forest biomass analysis, emergency data management, and water quality monitoring
  - **Build a roadmap** that provides ESA with recommendations for better exploitation of ICT within ESA activities to engage citizens, and also to provide ideas for follow-up activities.
- Budget: 150 000 €
- Schedule: 06/2014 – 08/2015 (14 months)
- Project contractor: VTT
  - Subcontractors: Pajat Solutions, Plan Finland
- http://educeo.info

Content

- What is Citizen Science?
- Demonstrations
  - Forest biomass analysis
  - Emergency management
  - Water quality monitoring

Citizen Science

- Oxford English Dictionary:
  - *“scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions”*

- Other related terms: crowdsourcing, volunteered geographic information (VGI), mobile sensing, participatory sensing, …

Citizen Science: Few examples

SETI HOME

LEVÄ VAHTI

GLOBAL FOREST WATCH

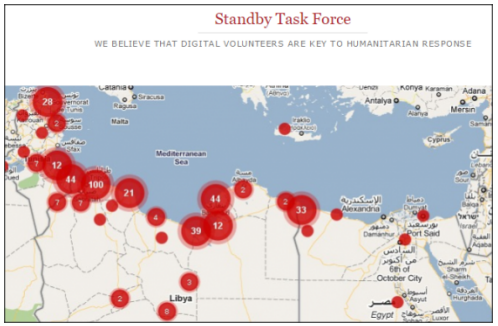
BETA VERSION

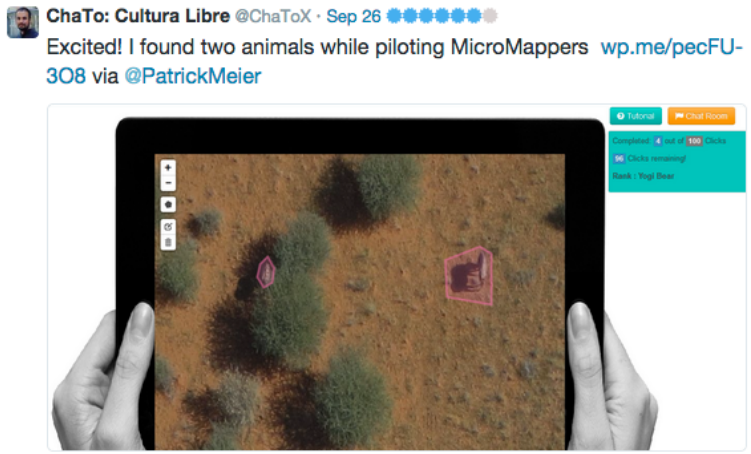
GALAXY ZOO

:SPEX

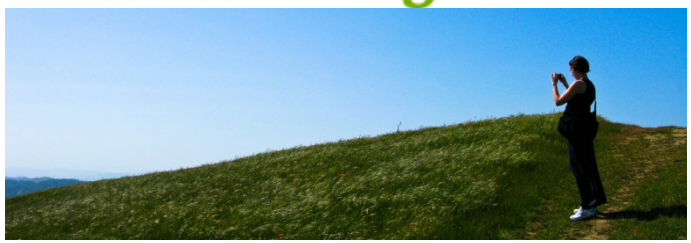
Air quality

SatCam





iNaturalist.org



Content

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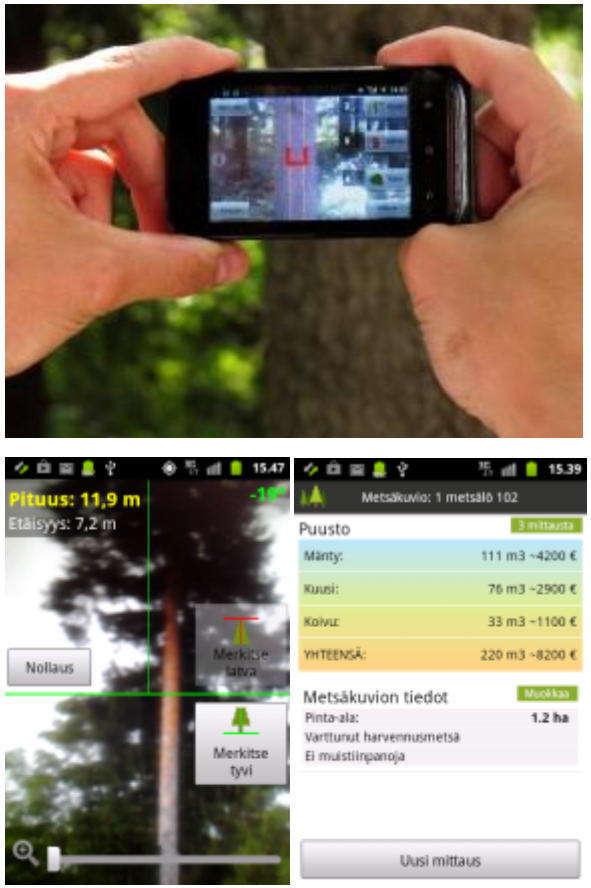
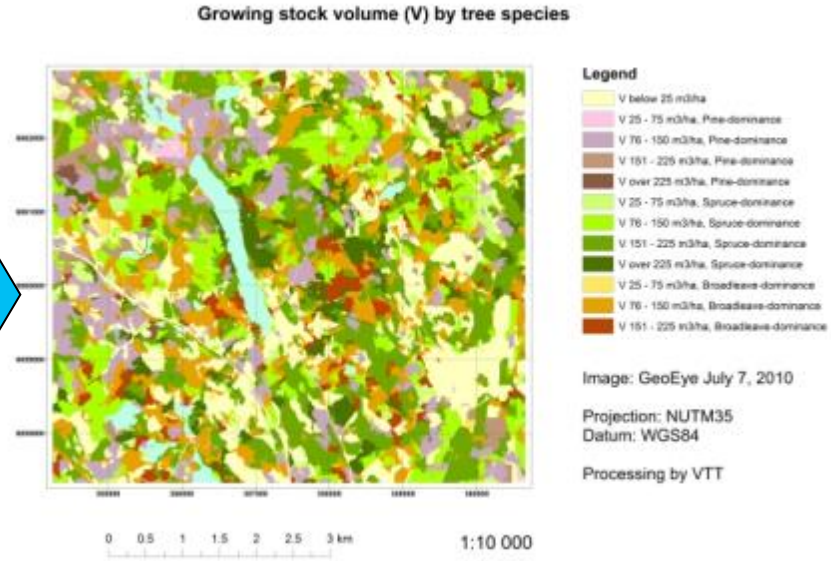
Forest Biomass Analysis

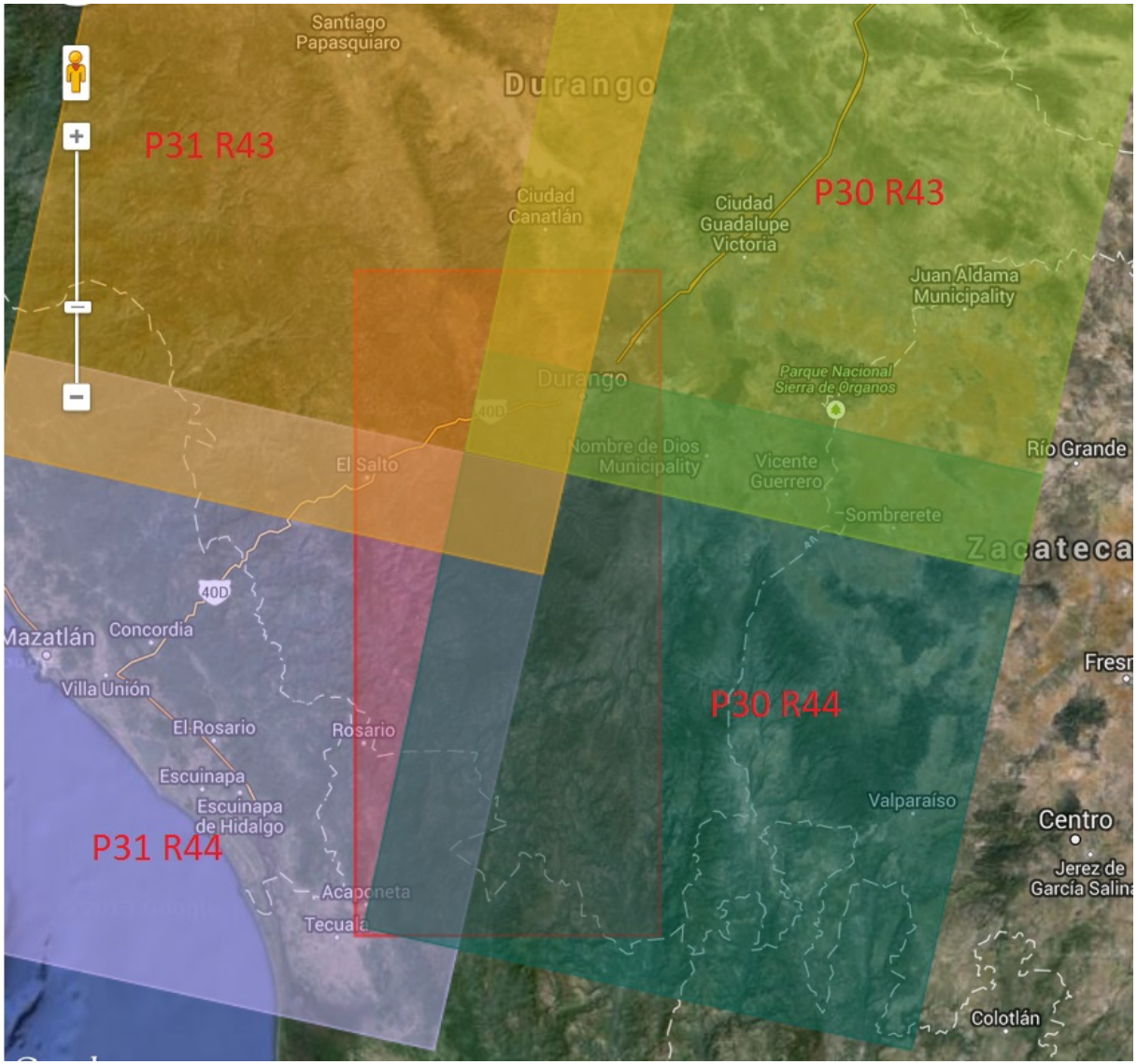




www.relasphone.com

Forest Biomass Analysis

- Volunteer users will gather forest inventory data including stem biomass (growing stock volume), tree species, tree height and age
- The measurements will be combined with remote sensing data, and a forest biomass map will be computed
- User group performing *in-situ* forest measurements are researchers from the University of Juarez from the state of Durango, Mexico.
- Pilot development will start with Landsat-8 imagery as a proxy for Sentinel-2 data.



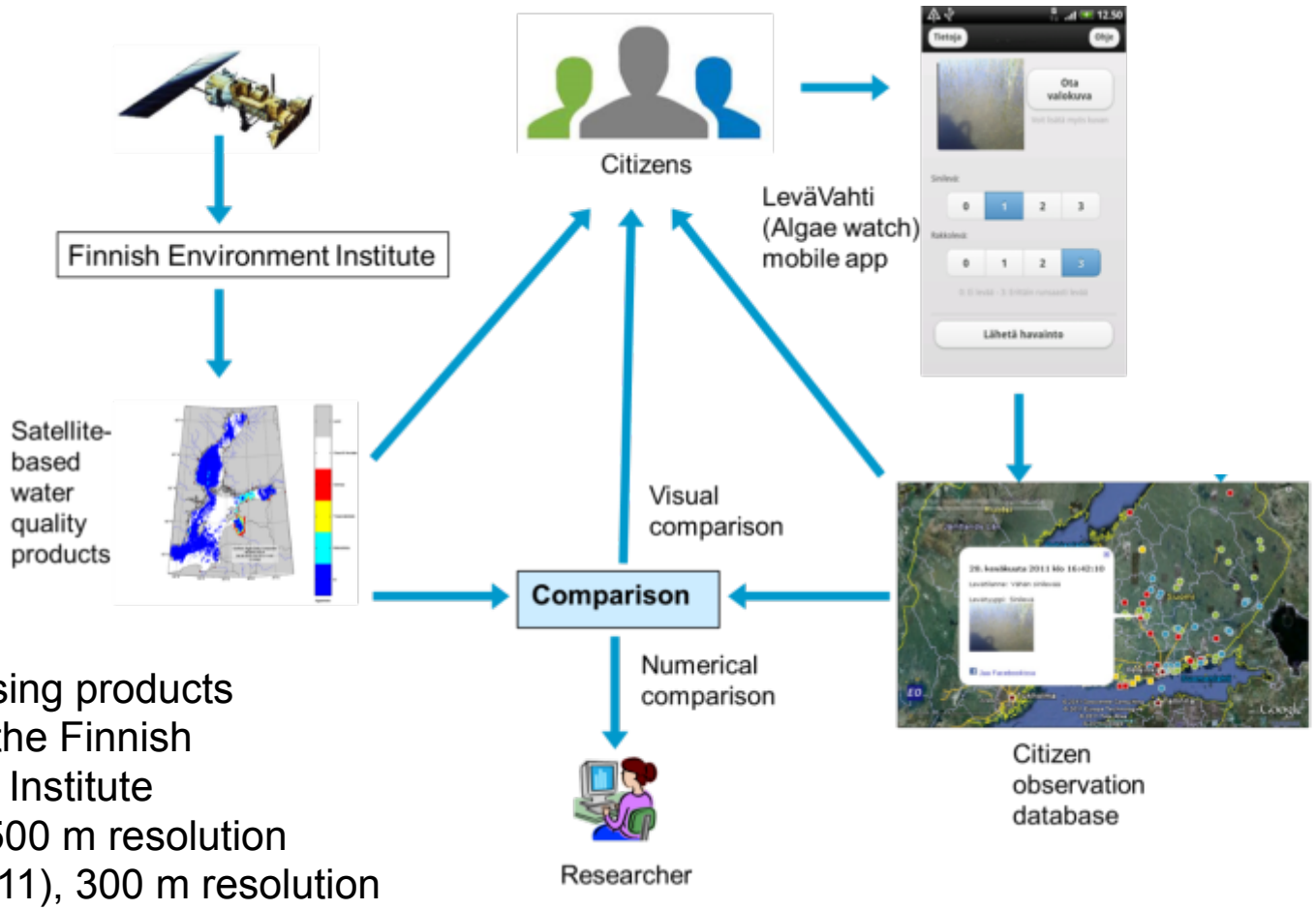
Satellite imagery

- The study area in Durango state (red rectangle) is overpassed by 4 Landsat scenes, from PATH 30 / ROW 43 to PATH 31 / ROW 44 (other rectangles). PATH 30 / ROW 43 covers most of the study area, but the 4 scenes are requited for a full coverage.
- About 30 images are available in the archives for each scene
- For every season, there is at least one scene with cloud cover lower than 25%, and often several images below 10% cloud cover are available
- This is a favorable situation for land cover mapping and forest biomass estimation

Emergency Data Management

- Pilot will seek ways to combine EO and CS data for better emergency data management.
- Study area: Philippines, the areas affected by typhoon Haiyan
- Analyzed CS data includes Plan collected data via Poimapper solution and other sources such as social media channels.
- Define simple processes for citizens, NGOs and volunteers to find and utilize up to date and freely available satellite imagery for coordination purposes and for building new not-for-profit services in disaster situations.

Water quality monitoring



Remote sensing products provided by the Finnish Environment Institute

- MODIS, 500 m resolution
- Meris (2011), 300 m resolution

Build a Roadmap

- **Goal:**
- Transferring the outcomes of the project into future scientific and operational activities
- Recommendations how to develop CS activities further within ESA
- Ideas for follow-up activities

Thank you

Contact

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TECHNOLOGY FOR BUSINESS