

## AI-EO services for sustainability integrating with Digital Earth Sweden

*Stockholm University and RISE (Digital Earth Sweden)*

### **Summary**

- Knowledge thresholds limit the uptake of remote sensing and Copernicus: we aim to democratise access to EO data and products in the public sector
- Digital Earth Sweden seeks to leverage investments in Copernicus and promote the use of open data to meet national public-sector needs.
- Incremental learning (IL) on the Digital Earth platform will provide constantly updated products and constantly improved products as more data is acquired and processed
- Product development and spatial coverage are scalable accord to user's needs

### **Solution**

We propose developing AI-supported operational mapping services, regularly updated as new data is acquired: These will meet the needs of users such as the Agricultural Board, Forest Council, County Boards and Swedish EPA. The system will be implemented using Digital Earth Sweden developed by RISE and housed at RISE, Luleå. It will be available as a web mapping service (WMS) accessed through a portal. We will start with demonstration products to be identified in consultation with users.

Our proposed system is expandable and scalable. It is self-improving through IL. Once the architecture is established and the main tools coded new usage scenarios or products can be added at relatively little cost. The system can be engineered to provide data over different spatial domains: from local to national or even global coverage. Thus international and global environmental challenges can be addressed.

The outputs from the services will be online maps of the selected variables with non-technical interpretations of their meaning in Swedish and English. Where sensitive information is involved user access can be restricted. The ability to output content will be dependent on the user needs and service type: downloads of map products, extraction of statistics of location specific notifications are all possible. Comparison with historical norms or averages are also potential outputs.

### **Concept Evolutionary Stage**

The concept is at Technology Readiness Level (TRL) 6 though components are TRL 7 or 8. Service development would require EO specialism at Stockholm University and would be a 3-5 year project depending on the number of mapping services to be deployed. Integration with Digital Earth Sweden and system engineering will require system specialist competence at RISE. For the duration of the services there will be a cost to maintain the architecture. Total budget is estimated at 2-4 Mkr/yr

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