

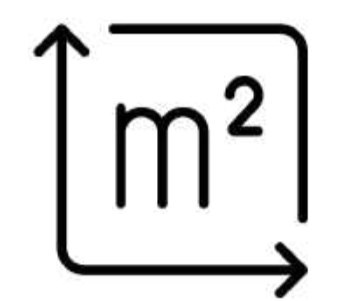
The first bespoke landcover map for Polesia:

a new and adaptable habitat mapping tool
applied to one of the largest natural landscapes in Europe



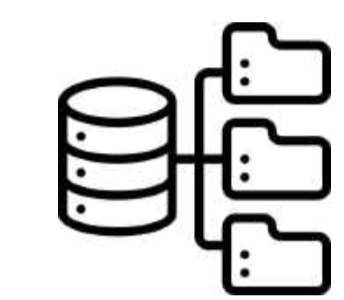
Location:

Polesia, Europe



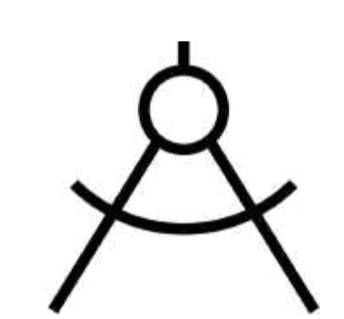
Study area:

13 million ha



Data source:

field surveys, Sentinel 1
and Sentinel 2 satellites



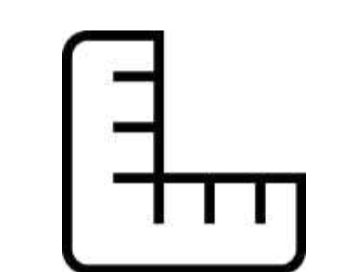
Tools:

Google Earth Engine,
Random Forest algorithm



Number of landcover
classes identified:

13 complex and
7 simple ones



Accuracy:

up to 87,2%

Context

The landscape of Polesia is diverse: vast mires, wild forests and river floodplains neighbor upon farmlands and settled areas. Polesia is also dynamic, transformed rapidly by seasonal floods, while slow yet significant processes change the landscape over longer periods of time. Some natural areas are degrading, others are restoring, and some habitats are being replaced by others altogether. In some places, anthropogenic impact is increasing while in others wilderness reclaims territory. Dynamic monitoring of Polesia's landcover is important to form a comprehensive picture of the condition, dynamics, and development of the natural areas of the region.

The essence of the study

Detailed and extensive habitat surveys were conducted by botanists across Polesia. Scientists applied this information to ground-truth data from advanced satellite images, and used machine learning to build predicative habitat maps for the whole of Polesia. The output is the first bespoke landcover map for the whole Polesia region, with a number of highly relevant landcover types included. The satellites continually survey the Earth's surface, enabling the landcover map to be generated seasonally and annually, and comparison of the data between periods will enable assessments of the landscape dynamics.

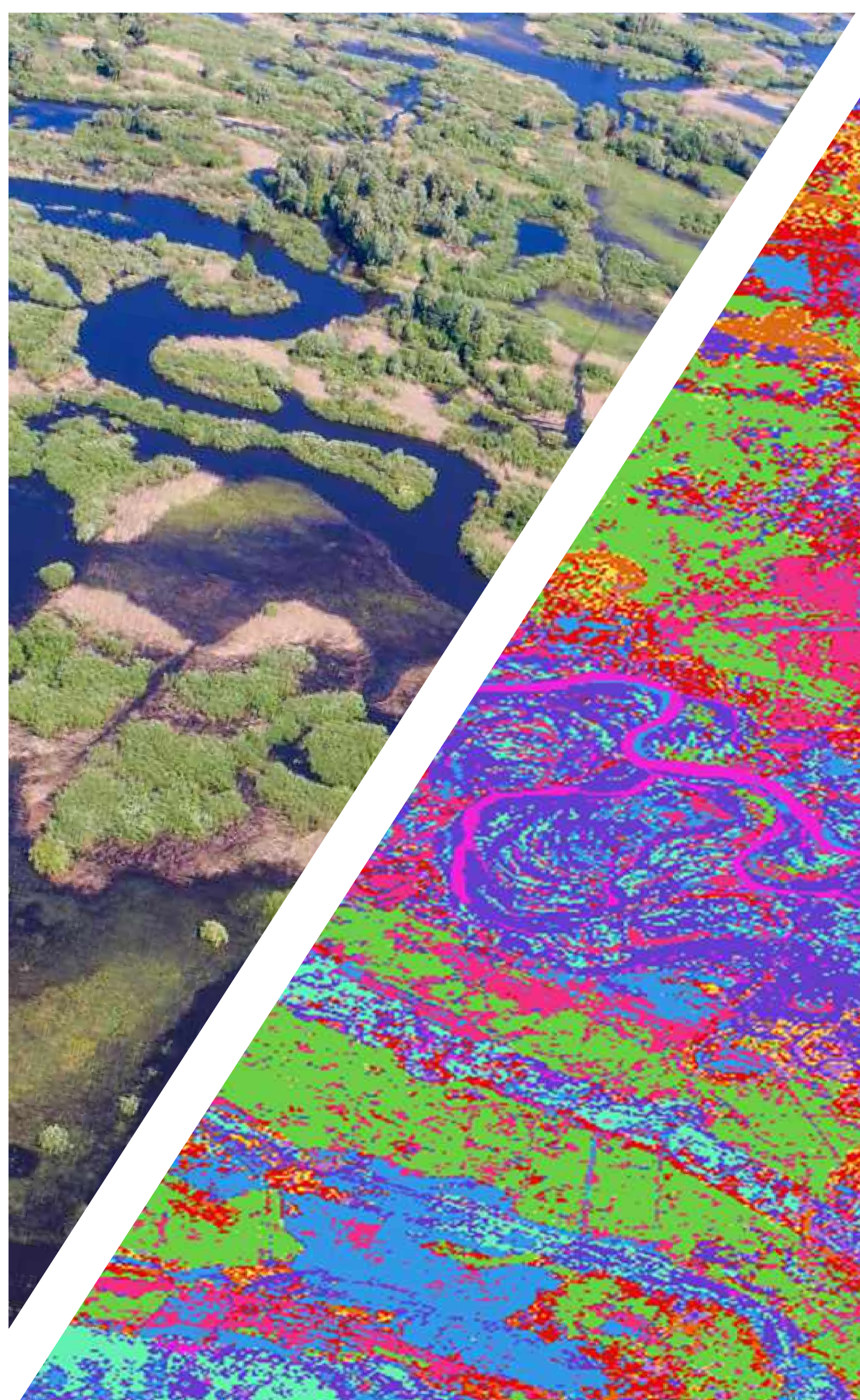
Outcomes

The study's authors offer a tool that categorizes landcover classes detected from satellite images, such as farmlands and urban territories, water, deciduous, coniferous and swamp forests, meadows, bogs and mires. Some of the abovementioned "simple" classes can also be split into "complex" ones: thus, for example, raised bogs can be differentiated from fen and transitional mires. The open-source landcover map tool is available at <https://github.com/tpfd/Polesia-Landcover>.

Application potential

- dynamic monitoring of restoration or degradation of natural areas;
- tracking changes in land use;
- analyzing the intensity of seasonal floods;
- assessing landscape connectivity;
- mapping species distribution;
- planning and justifying protected area enlargements.

The authors describe their methods and experience, useful for those applying these ideas to study areas beyond Polesia. They invite all interested parties to help further the development of the tool, such as new features and focus areas for potential improvements.



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