

BioSpace25 - Biodiversity insight from Space
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Season of Lakes: Deriving Phenology using Remote Sensing Data

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Introduction

- Freshwater phenology:
 - described by Phytoplankton dynamics
 - an **Environmental Biodiversity Variable**

Aim: a scalable method to derive freshwater phenology from EO data

- Developed as part of EU Horizon project OBSGESSION

Freshwater Phenology and Remote Sensing

proxy for

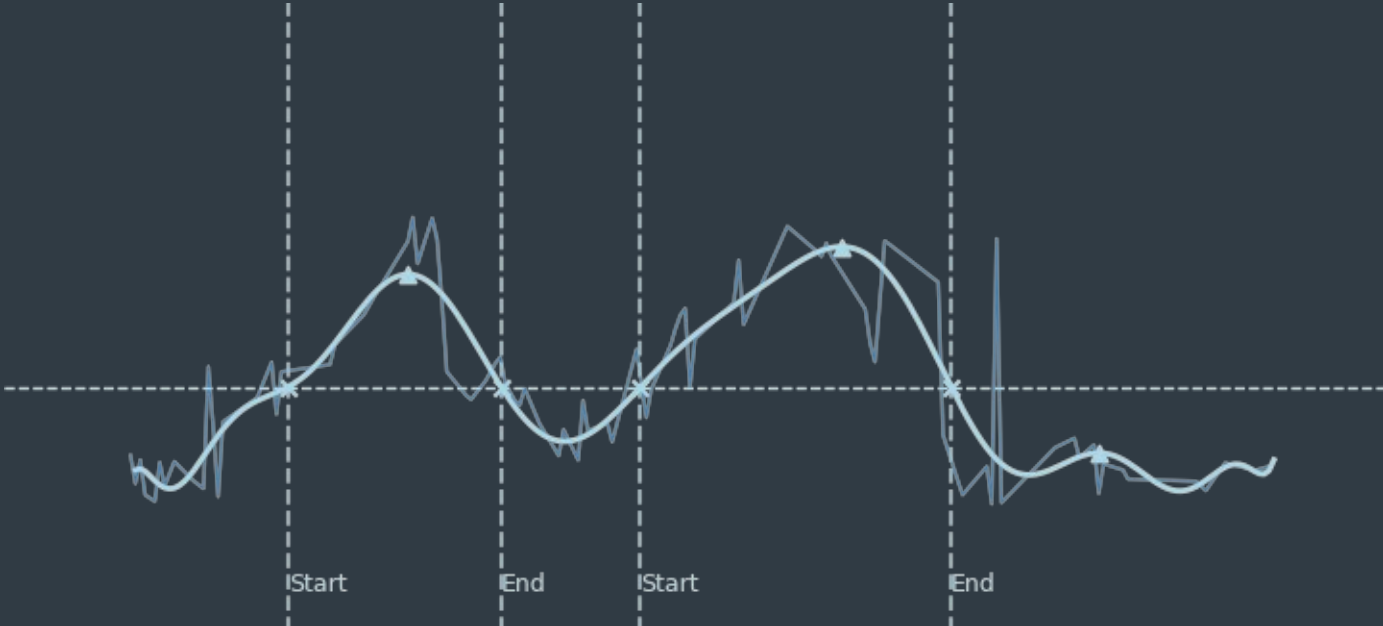
Freshwater
Phenology

Dynamics of
phytoplankton
biomass (blooms)

Chlorophyll-a
concentration
(satellite-derived)

described by

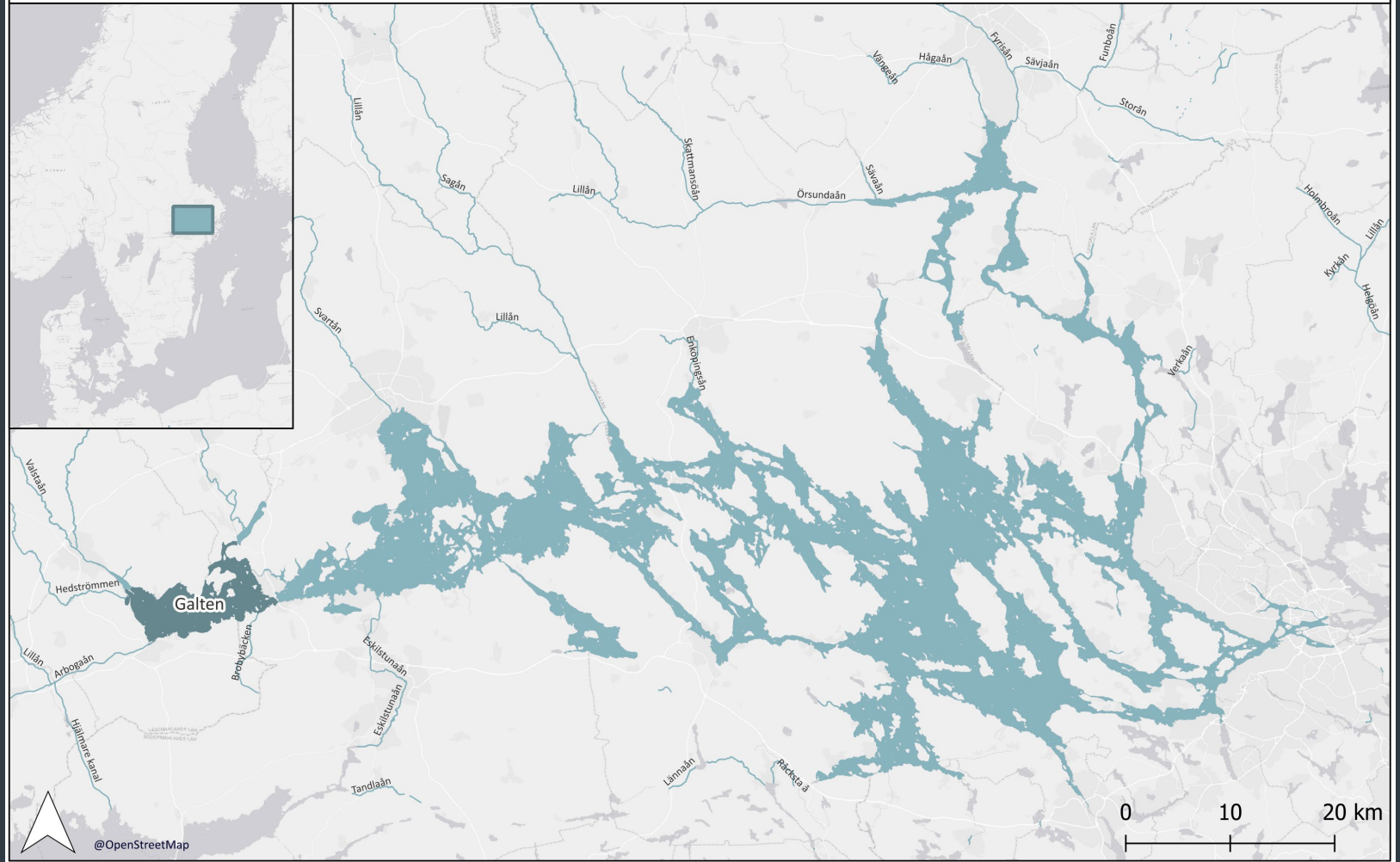
Method - From Chl-a to Bloom



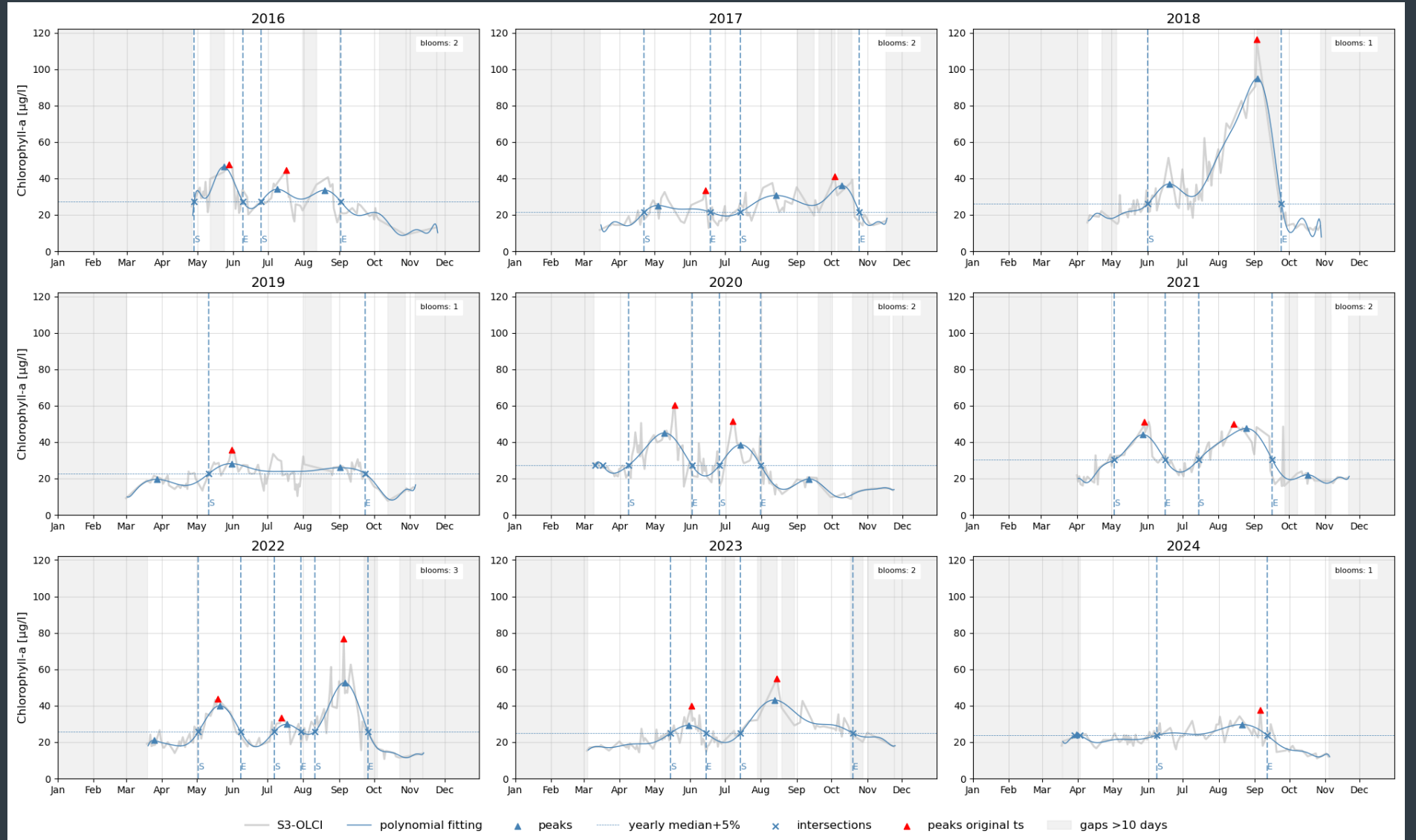
* threshold: yearly median(chl-a) + 5%

Pilot Site

Mälaren (Sweden)



Results

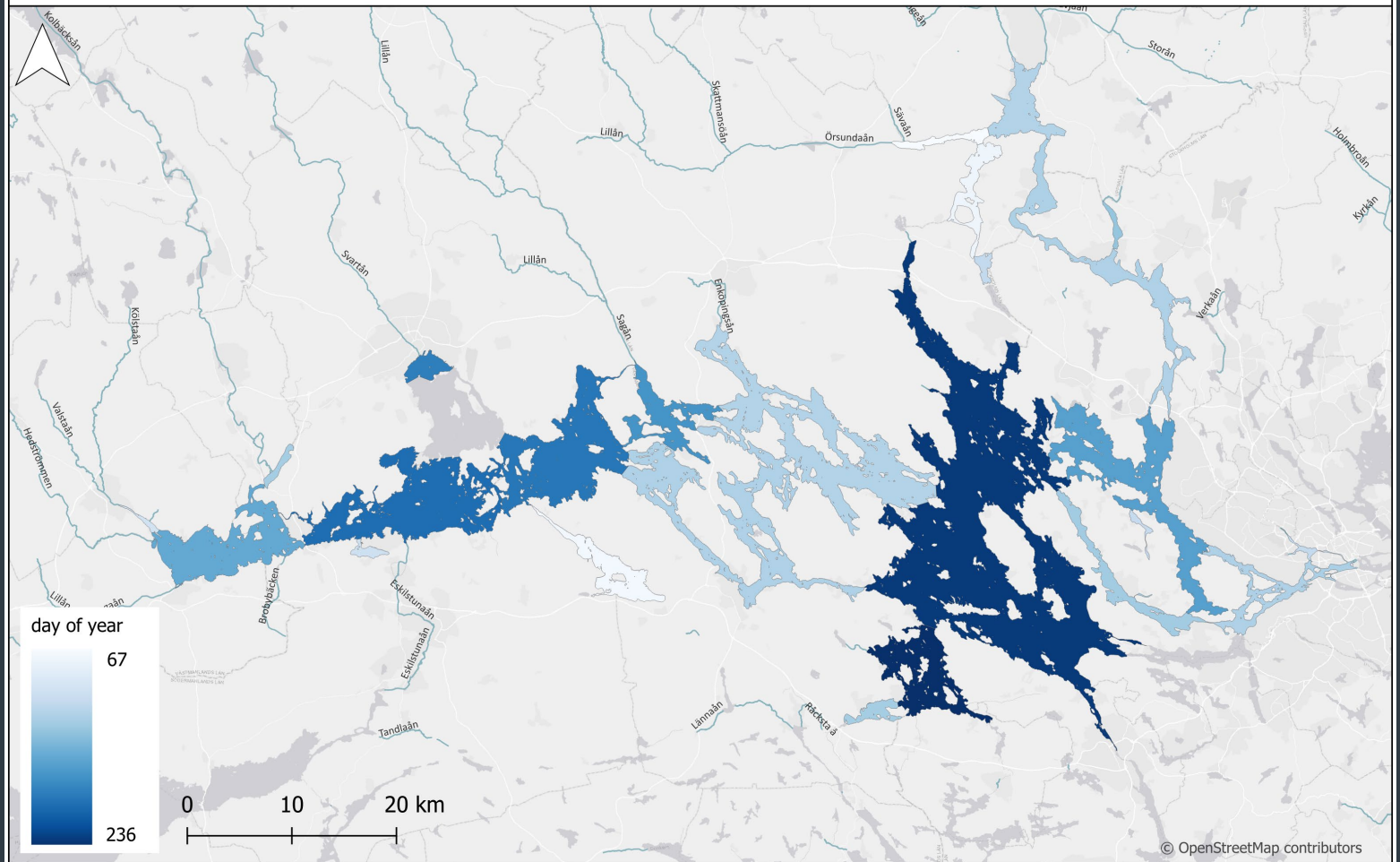


*Mälaren-Galten

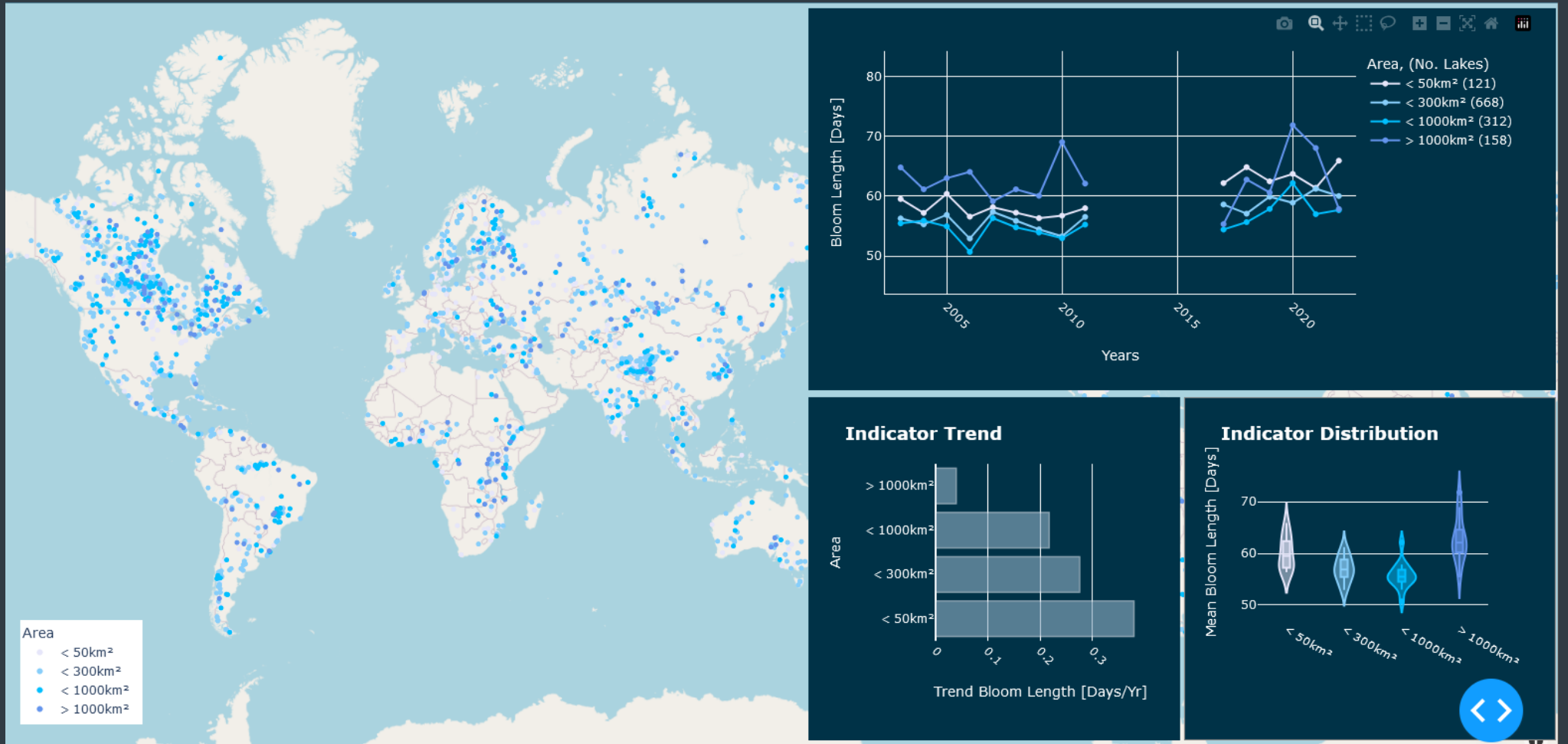
Results

Metrics	Unit
Start, End, Peak timing	Day of Year
Length	Count
Value at Peak	Chl-a [$\mu\text{g}/\text{l}$]
Integral	$\mu\text{g}/\text{l day}$
Number of Blooms per Year	Count

Mälaren (Sweden) - Start of 1st bloom (2024)



Lakes CCI



* Metric: the largest bloom of the year

Future Work

- Derive Freshwater Phenology on a European scale within the OBSGESSION project

Recommendations

- **Continued development of the method to refine the detection of different features** and to adjust to different locations and water types
- Support estimation and monitoring of freshwater phenology, **on a regional to global scale**, as an important metric for the biotic part of the ecosystem
- **Support the development of EBV workflows and indicators** (Ecosystem functioning - Phenology) for monitoring of freshwater biodiversity and ecosystem change