



# EO Applications for Integrated Maritime and Territorial Spatial Planning in the Baltic

**BALTIC EXPRO+  
BalticAIMS**  
Newsletter 04/2023

**Targeting progress in  
utilizing EO derived  
information for Baltic Sea  
needs and actions**

**Technical solutions for  
data access developed and  
applications demonstrated**

**BalticAIMS Partners:**



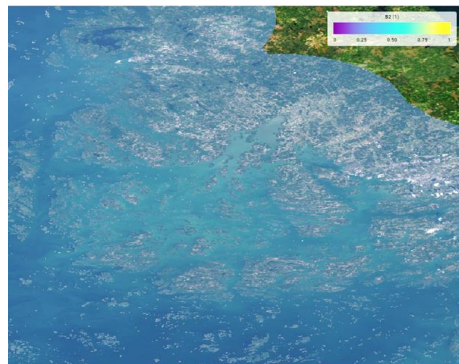
## Key results of the BalticAIMS project

For selected demonstration areas in the Baltic Sea, BalticAIMS has:

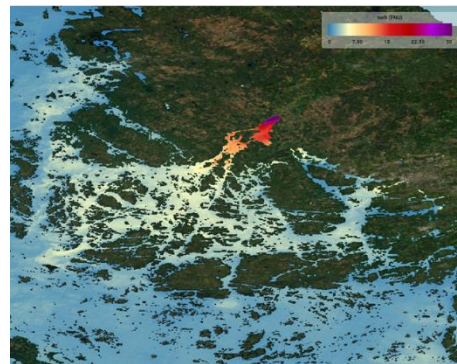
- Collected and combined different data sources into ready to use data
- Developed technical solutions for easy access to EO derived products
- Implemented several user stories, addressing real-life questions of stakeholders and showcasing the applications in user workflows
- Assessed the utility of the BalticAIMS services and products

## BalticAIMS Product suite

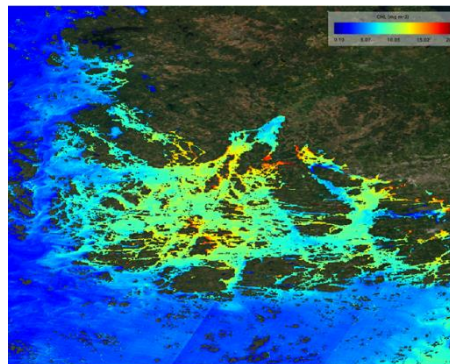
- Sentinel-2 true colour images
- Turbidity
- Chlorophyll-a and algal blooms
- Sea Surface Temperature (SST)
- Corine Land Cover
- HELCOM phosphorous and nitrogen load



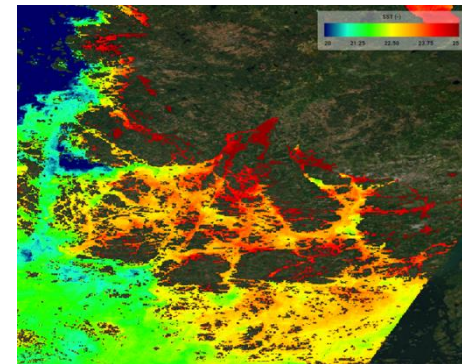
EO Sentinel-2 True colour



EO Turbidity - Sentinel-2



EO Chlorophyll - Sentinel-2

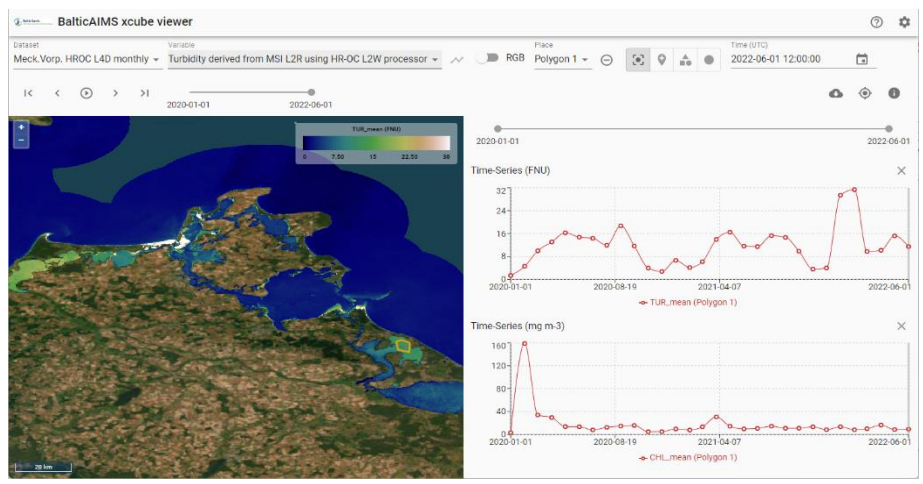


EO SST - Landsat-LC8

*BalticAIMS service contains modified EU Copernicus and USGS/NASA Landsat program data (processing by SYKE), and Copernicus Marine Service (CMEMS) Information*

# BalticAIMS technical solutions

## BalticAIMS browser-based Viewer



## Tarkka+ - Browser-based Graphical Interface

**EO**

- RGB
- EO turbidity
- Cases, where human impact are clear
- Seasonal (summer, spring turbidity, chl-a)
- Algae blooms
- Wintertime RGBs

**GIS**

- Available GIS material on coastal activity
- GIS material, where human impacts identified from EO material are identified (TBD)

**Stations**

- Coastal stations (WQ)
- Automated temperature network

## Xcube Jupyter Notebooks

```

from shapely.geometry.polygon import Polygon
from xcube.core.kit import open_cube
mandatory xcube store reports
from xcube.core.store import find_data_store_extensions
from xcube.core.store import get_data_store_params_schema
from xcube.core.store import new_data_store
import numpy as np
import matplotlib.pyplot as plt

import pandas as pd
import datetime
import geopandas as gpd
# 1. Access the good database
# The good holds all vector data, among others
# list data sets
# In order to get an overview an available data
In[3]:
good = GeoClient()
c1 = good.get_my_collections()
c1
# Select data set from the list
# The dataset 'hlscoast_glc_agricultural_land_2018'
In[4]:
good = GeoClient()
good.get_my_collections()
# good.get_collection('hlscoast_glc_agricultural_land_2018')
# list the data cubes that are available on
In[5]:
# Display the selected data set
In[6]:
plt.plot(columns.background, 'cmap=tab20', figsize=(10, 10))
# 2. Open and display a BalticAIMS database
# The database contains raster data sets, which
# list the data cubes that are available on
In[7]:
store = new_data_store('3', root='balticaims/')
list(store.get_data_ids())
# open one of the data cubes
# we want to look into the monthly averages for
In[8]:
# open cube 'hlscoast_glc_agricultural_land_2018'
store.open_data('hlscoast_glc_agricultural_land_2018')
# list the monthly averages for a selected
# list above shows the time range available
In[9]:
TUR_mean[all[time]].plot(show=fig)
                    
```

## BalticAIMS Web Feature Service integration for GIS use

## BalticAIMS service based on User and Stakeholder requirements

- Timeseries of Chl, TSM, SST with high spatial resolution
- Simple interfaces for easy access to data
- Possibility to integrate products in User Systems

## Road towards an EO based Baltic monitoring support service

**For more information, visit:**

<https://www.syke.fi/projects/BalticAIMS>

**Or contact:** Sampsa Koponen -  
*BalticAIMS Project Coordinator*

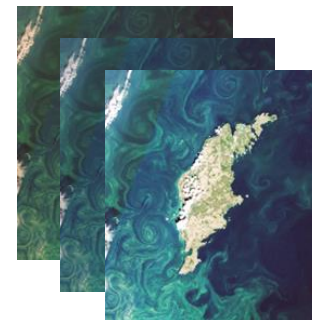
[sampsa.koponen@syke.fi](mailto:sampsa.koponen@syke.fi)

## Feedback from Users and Stakeholders



“BalticAIMS Service offers easy access to the EO based products for users at different skill levels and without the need for advanced GIS software”

“Dedicated access to satellite images and EO based raster products relevant for spatial planning and monitoring of coastal land and waters of the Baltic Sea is a substantial improvement”



## Future developments

### Service expansion:

- *New application examples*
- *New products*
- *Full Baltic coverage*



### Technical developments:

- *Improved GIS functionality and Ready to use Jupyter Notebooks*
- *Access to analysis ready data*

