

Image source

Honkavaara, E., Hakala, T., Kirjasniemi, J., Lindfors, A., Mäkynen, J., Nurminen, K., Ruokokoski, P., Saari, H. and L. Markelin, 2013. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-1/W1, ISPRS Hannover Workshop 2013, 21 – 24 May 2013, Hannover, Germany



In water research hyperspectral imaging reveals changes in plankton, algae and vegetation in overall. It can be also used for monitoring typical water quality parameters. Case study from lake Lohjanjärvi is presented in the following slides.

HYPERSPSPECTRAL CAMERA



WATER RESEARCH

SENCO P

HYPERSENSPECTRAL CAMERA

WATER RESEARCH

CASE STUDY

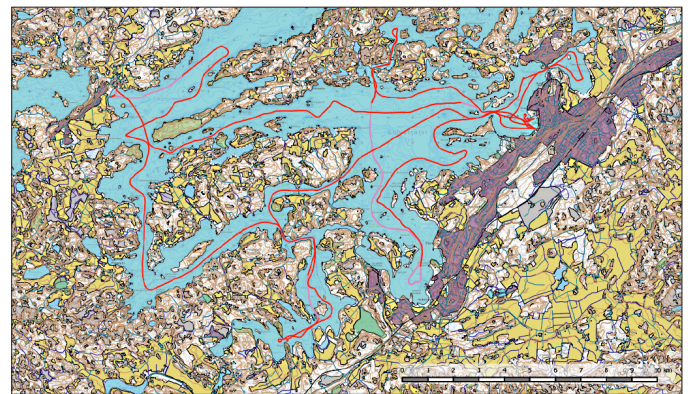
In lake Lohjanjärvi water quality parameters were measured from the manned aircraft using Fabry-Perot filter based hyperspectral camera. At the same time, reference measurements were taken manually from the boat on the lake. Good correlation were achieved, and results are presented below.

Utilization of FPI based spectral imager in fresh water monitoring

Test setup:

- Using frame based spectral imager (500-850 nm) from manned aerial vehicle
- Flying height and GSD: 2000m ->2m
- Reference measurements by LUODE Consulting Oy
 - YSI-6600 (1 measurement/second):
 - Temperature
 - Conductivity
 - Turbidity
 - Chlorophyll-a
 - Blue-green algae
 - S::CAN UV-VIS (1 measurement/30 seconds):
 - Turbidity
 - NO₂₃-N (nitrate)
 - TOC (Total organic carbon)
 - DOC (Dissolved organic carbon)

- Route for the reference measurements as red line in the image below is presented
- Measured same time with spectral imaging campaign



• Using regression modelling with spectral radiance data and reference measurements, we can see that there is strong correlation between spectral features and

- Turbidity
- Chlorophyll
- Nitrates
- Blue-Green algae
- TOC and DOC

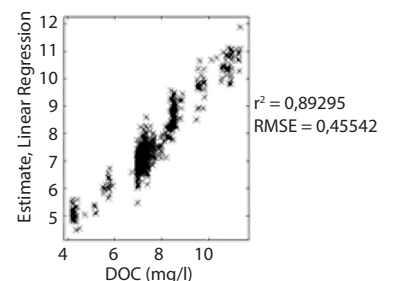
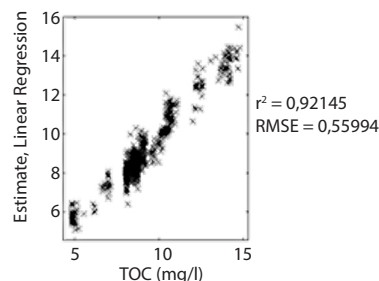
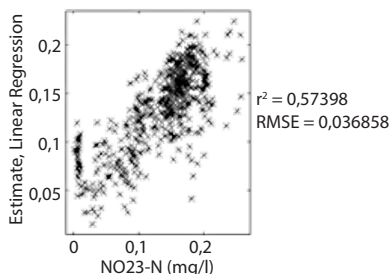
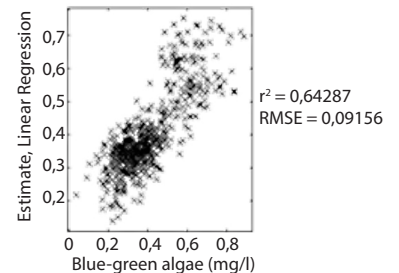
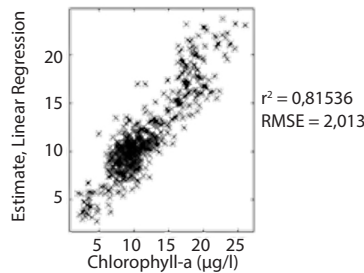
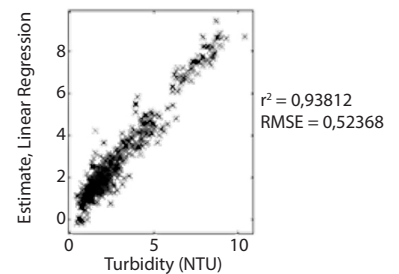


Figure source:

Anna-Leena Erkkilä, Ilkka Pölonen, Eija Honkavaara, Antti Lindfors, Teemu Näsi: **Utilization of FPI based spectral imager in fresh water monitoring**

