



Using s::can spectro::lyser™ with ruck::sack in the Krycklan Research Catchment

Environmental monitoring

The Krycklan research catchment is one of the most ambitious projects integrating water quality, hydrology and aquatic ecology in running waters. The spectro::lyser in combination with a ruck::sack for automatic cleaning proved to be an ideal real-time monitoring solution.

Background

Presently there is an increasing interest in the role of flux and transformations of dissolved organic carbon (DOC) in inland waters. These fluxes are crucial components in the landscape carbon budgets and the DOC quality is tightly linked with a large number of elements such as nitrogen (N), phosphorus (P), metal cations, trace elements, and environmental pollutants.

The research group working within the Krycklan Catchment Study (www.slu.se/Krycklan) in northern Sweden is among the leaders in this currently very active research field.

s::can's Solution

Moving over to s::can spectro::lyser in the Krycklan research program not only allows to make very accurate and precise carbon budgets, it also provides researchers with high resolution assessments of the variability in the DOC quality.

Presently most other field research infrastructures worldwide are insufficient in scope to properly assess the role of all components of inland waters in the face of climate change.

The Krycklan catchment study

The 30 year research program in the Krycklan catchment study includes 18 monitored streams ranging in size from 0.1 to 68 km² and a 150 meter flux tower that allow accounting for

multiple spatial and temporal scales of all carbon sources and sinks that are essential to consider. By acquiring another set of s::can instruments they will further strengthen the world-leading

Krycklan research infrastructure to allow for a more in-depth focus on lake, stream and river ecosystems and their role(s) in the landscape.

Furthermore, through this investment to fundamental research, it is also possible to provide a harmonized and long-term measurement program which yields consistent and comparable data that capture ongoing changes across spatial and temporal scales. This experimental facility is openly accessible for any interested user and allows studies on topics ranging from fundamental principles in aquatic ecosystem ecology, practical management tools to minimize water quality perturbation, to the long-term responses in streams and lakes in the face of environmental change.



“...after 1 year of only automatic cleaning with the ruck::sack, manual cleaning decreased the TOC value of 1%...”

Peder Blomkvist,
First technician in the Krycklan Catchment Study



**Swedish University
of
Agricultural Sciences**

Parameters monitored:

- Fingerprints
- TOC
- DOC
- Conductivity
- Temperature

Facts & Figures

Company:
Swedish University of
Agricultural Science

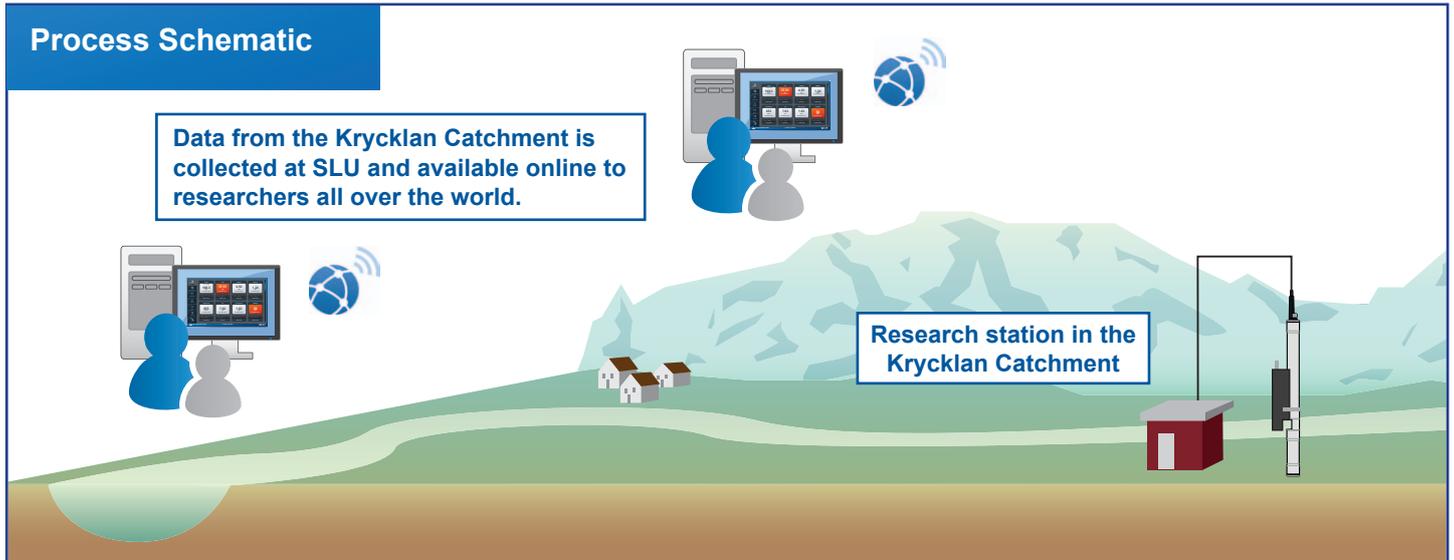
Location:
Krycklan Catchment,
Sweden

Application:
River and Creek Water

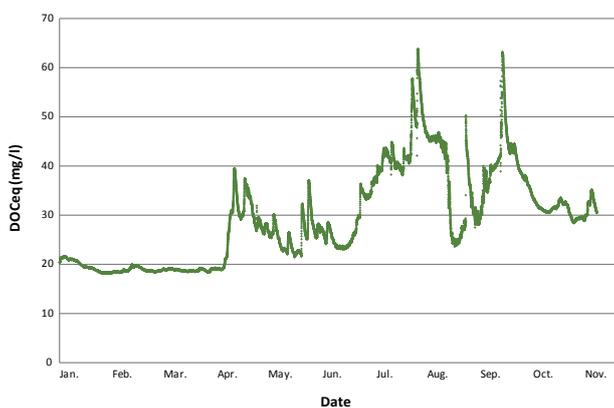
Key Products installed:
spectro::lyser, ruck::sack

s::can Partner:
Luode Consulting,
Dr. Niklas Strömbeck

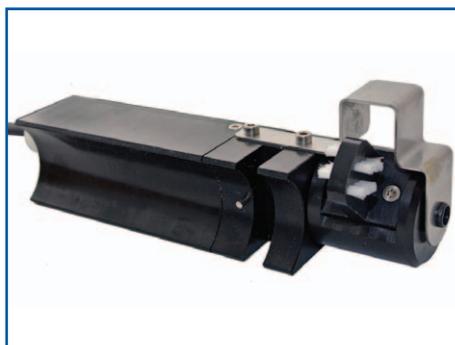
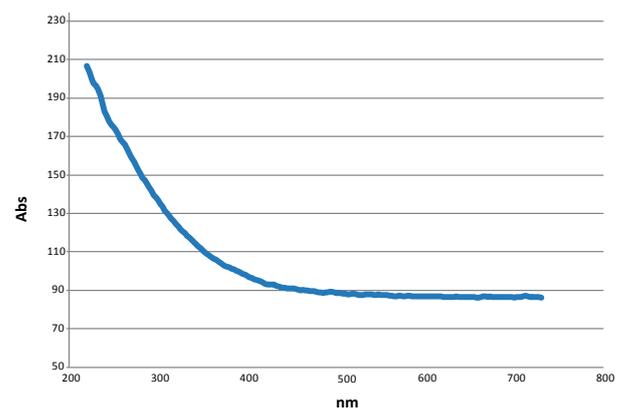
Process Schematic



Changing DOC values over the course of one year at station Krycklan 02



Spectral fingerprint from the water at station Krycklan 07 measured with the spectro::lyser™



The Krycklan research catchment is located in the middle of Sweden and one of the most ambitious projects integrating water quality, hydrology and aquatic ecology in running waters in the boreal region.

At present, the Krycklan Catchment Study includes over 40 scientific projects spanning from fundamental scientific research to more applied studies, with participating scientists from more than 20 countries.

Effective automatic cleaning is a crucial factor when using optical probes in remote locations.

The ruck::sack is a submersible rotating brush to effectively control fouling in low-solids waters like sea, lakes, and larger streams applications.

With its low power consumption the ruck::sack can easily be powered with solar panels.

The s::can spectro::lyser™ is a fully submersible UV/Vis spectrophotometer. Besides parameters like Turbidity, TOC, DOC and many more the spectro::lyser also records the spectral fingerprint of the water.

The fingerprint contains a wealth of information and can be used for extensive in detail research.