

Workshop on using Water Quality Forecasting in Decision Making

Brussels, Belgium – April 19th, 2018

Background

Drinking water accounts for around 18% of total fresh water abstractions in the European Union, and is treated and supplied by almost 70,000 utilities. While our freshwater resources are already limited, they face additional and increasing pressures from drought, flooding, pollution, population growth, as well as the demands for other uses including agriculture, energy production, ecosystem protection and recreation.

Performance efficiency in water utilities is usually associated with ensuring good water quality and reliability in providing a continuous supply of safe and clear water. Environmental and financial impacts have often been underestimated. More sustainable and efficient use of energy and chemicals in water treatment is an ongoing challenge, together with intensifying water resources protection and management into sectoral policies.

Technological innovation is instrumental in addressing our increasingly complex and multidisciplinary water challenges in a way that ensure sustainability while supporting economic growth. Space technology is part of promoting and supporting innovation by providing environmental information which can be used to improve preparedness and planning by water utilities and other end users.

SPACE-O (<http://www.space-o.eu/>) aims to integrate state of the art satellite technology for water quality monitoring and advanced hydrologic and water quality modelling using ICT tools for generating real time, short to medium term forecasting of water flows and key water quality parameters (e.g. turbidity, algae) in reservoirs, that in turn will be used to support decision making in water supply services.

Workshop overview

Space-O is developing technology and methods that are targeted to water utilities, and the inputs of this group has been crucial to ensure the development of functional and user friendly tools. The **purpose of this event** is to present SPACE-O prototype products to end users in the region, allowing for outputs to be tested, shaped and customized against real operational conditions.

The products include a risk-based decision support system (DSS) to enable cost-effective and environmental sustainable operation of Water Treatment Plants (WTP). This will use Earth Observation data to provide information such as water quality forecasting (on reservoir sources), in-situ monitoring data and data collected through SCADA (Supervisory control and data acquisition) systems in WTP for operation control.

The workshop will be focusing on the application and economic viability of a decision support system that will help water utilities dealing with algal blooms and/or turbidity in their surface water sources.

Objectives

The objectives of this consultation process with utilities include:

1. To learn about SPACE-O and how the outputs can be used;
2. To understand how problems like algal blooming and high turbidity affect operations of water treatment plants and reservoir managers in the provision of drinking water;



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3. To identify the economic impact of these problems in utility operations, and investments being undertaken to moderate or mitigate these impacts;
4. To compile information on the potential uses of SPACE-O products (e.g. satellite imagery and forecasting).

Session	Time	Agenda Items
1	09:00-09:30	<p>Welcome and introduction</p> <ul style="list-style-type: none"> ● Introductions ● Overview of SPACE-O ● Workshop objectives ● Structure of workshop
2	09:30-10:30	<p>Priorities and Challenges</p> <p>Expected Outputs</p> <ol style="list-style-type: none"> 1. To understand how problems like algal blooming and high turbidity affect operations of water treatment plants and reservoir managers in the provision of drinking water; 2. To identify the economic impact of these problems in utility operations, and investments being undertaken to moderate or mitigate these impacts
	09:30-09:35	<i>Short presentation of survey results</i>
	09:35-10:15	<p><i>Group discussions to share experience guided by the following 3 questions:</i></p> <ol style="list-style-type: none"> 1. Do these “problems” (high turbidity/algal blooms) affect operations? 2. What type of economic impact have the algal blooms and turbidity had on operations? 3. What type of investments have been undertaken to reduce or deal with the algal blooms and/or turbidity? <p>Note – groups will be determined by operation type and will discuss all questions</p>
	10:15-10:30	Feedback from each group
	10:30-11:00	Coffee break
3	11:00-12:00	<p>DSS Component: Environmental Information system</p> <p>Expected Outputs:</p> <ol style="list-style-type: none"> 1. To learn about SPACE-O and how the outputs can be used; 2. Demonstrate functionality of an EIS for utility staff and citizens
	11:00-11:20	<p><i>Overview of what SPACE-O will provide (how will process EO and model data) - EuroDynamics</i></p> <p>20 mins (5 min overview, 10 min demonstration, 5 min Q&A)</p>

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	11:20-12:00	<p><i>Exercise using environmental information system</i></p> <ul style="list-style-type: none"> - Follow a set of exercises - Discussion questions (e.g. how would you use the information in practice? Who would find it useful and how would they apply it?) - Assessment of the Environmental Information System component
4	12:00-13:00	<p>DSS Component: Early Warning System</p> <p>Expected Outputs:</p> <ol style="list-style-type: none"> 1. To learn about SPACE-O and how the outputs can be used; 2. Demonstrate functionality of an EWS for utility staff and lake managers
	12:00-12:20	<p><i>Overview of what SPACE-O will provide - EMVIS</i></p> <p>20 mins (5 min overview, 10 min demonstration, 5 min Q&A)</p>
	12:20-13:00	<p><i>Exercise using early warning system</i></p> <ul style="list-style-type: none"> - Follow a set by step exercise <p><i>Discussion questions (e.g. what information is useful, what is missing?)</i></p> <ul style="list-style-type: none"> - Assessments of the Early Warning component
	13:00-14:00	LUNCH – Group Picture!
5	14:00-15:00	<p>DSS Component: Optimizing performance in water treatment plants – sharing experiences</p> <p>Expected Outputs:</p> <ol style="list-style-type: none"> 1. To learn about SPACE-O and how the outputs can be used 2. Information on how forecasting data can be used to make decision on operations
	14:00-14:20	<p><i>Overview of what SPACE-O will provide on forecasting and decision support – EMVIS</i></p> <p>20 mins (5 min overview, 10 min demonstration, 5 min Q&A)</p>
	14:20 - 15:00	<p><i>Exercise on the use of forecasting in decisions to improve performance</i></p> <ul style="list-style-type: none"> - Follow a set of exercises - Discussion questions (e.g. what forecasting information do you need, how would the information be used to make decisions) - Assessment of the Optimizing Performance component
	15:00-15:30	Coffee break
6	15:30-16:30	DSS component: The potential uses of SPACE-O products in supporting

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		<p><i>upstream risk management</i></p> <p>Expected Outputs:</p> <ol style="list-style-type: none"> 1. To learn about SPACE-O and how the outputs can be used 2. Information used and gaps to asses upstream risks 3. Process of responding to risks
	15:30-15:50	<p><i>Overview of what SPACE-O will provide in supporting upstream risk management – IWA/EMVIS</i></p> <p>20 mins (5 min overview, 10 min demonstration, 5 min Q&A)</p>
	15:50-16:30	<p><i>Exercise on upstream risk assessment</i></p> <ul style="list-style-type: none"> - <i>Follow a set of exercises</i> - <i>Discussion questions (how do you determine your upstream risks, where do you get information from?)</i> - <i>Assessment of the Upstream Risk component</i>
7	16:30-16:45	Complete survey providing feedback on training
	16:45-17:00	Close and next steps
	17:15-18:15	Networking drinks