

Water Management in Cold regions

At the University Centre in Svalbard (UNIS)



A NorCan seminar: Network for capacity building in water sanitation and health in the Arctic

Co-convenors: Petter D. Jenssen; Harsha Ratnaweera & Roland Kallenborn (Norwegian University of Life Sciences)

In collaboration with the International Joint Research Centre for Arctic Ecosystem and Environment (IJRC-EAA) at the Harbin Institute of Technology (HIT) - Yifan Li

Globally, circumpolar regions are seeing the most dramatic climate change related impacts, which particularly impact High North communities. Changes include retreat of sea- and land fast ice coverage, increased erosion at coast-lines, loss of permafrost damaging buildings and piped infrastructure as well as ecosystem changes. However, these changes will also make the region increasingly accessible for economic development, e.g., resource extraction and tourism. Thus, the local communities and municipalities in the circum-Arctic regions are facing tremendous challenges when it comes to adjustments in infrastructure and planning of new technological solutions on restricted budget frames. While often not critically evaluated for alternatives, drinking water and sanitation installations and sewage handling procedures are central to community level infrastructure development plans along with the ever-increasing demand on energy for industrial developments.

Today, drinking- and wastewater treatment systems in Arctic regions are under serious pressure. The wastewater treatment range from the application of mechanical treatment plants to passive treatment systems consisting of waste stabilization ponds (WSPs), natural or engineered wetlands, and composting or bucket toilets. In many of the poorer communities' human excreta/wastewater receives no treatment. Melting permafrost zones add increasing vulnerability to physical structures and community-based water services, which are compounding problems resulting from sociological changes in the High-North. Poor sanitary conditions often combined with inadequate water supply give rise to (enteric, skin and respiratory) health problems that compound with Arctic environmental health issues. Hence, rural water and sanitation is one of the identified health-related priorities also acknowledged by the Arctic Council (<http://www.arcticcouncil.org/index.php/en/documents>).

Discharge of wastewater into the vulnerable ecosystems in the Arctic may also require different technologies or system designs than those used in warmer climates. Currently, limited information exists about water handling facilities in the Arctic, resulting in considerable uncertainties about the performance and environmental sustainability of existing or potentially different future systems. Changing paradigms aspiring to closed-loop systems and economies also need to be considered for water and sanitation services, such as resource recovery for energy, nutrients and water – yet many institutional and governance barriers inhibit this change.

This summer school invites graduate level students and regulatory experts alike who intend to achieve relevant scientific and administrative knowledge for the sound development of suitable solutions for decentralised water treatment technologies under the harsh climate conditions of the Arctic.

Registration (email): - **Please note: No official registration without electronic confirmation** -

NMBU: Roland Kallenborn: roland.kallenborn@nmbu.no
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Tentative Program

Time and location: June 18th – 23rd, University Centre in Svalbard (UNIS), main lecture hall “Møysalen

Monday June 18th, 2018

09:00 h Departure from OSL to LYR
15:00 h Arrival and registration and check-in in the student hostel “Sjøskrenten”
19:00 h informal icebreaker at UNIS “fire place”

Tuesday June 19th, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Safety instructions and practice exercises for “field work on Svalbard	n.n. UNIS logistics
12:00 – 13:00	Lunch	
13:00 – 14:00	Introduction into the Teaching program: Logistics, Priorities and field experiments): Assignments and timeline	Petter Jenssen/ Harsha Ratnaweera/ Yifan Li
14:00 – 14:45	Introduction into waste water treatment	Petter Jenssen
14:45 – 15:00	Coffee break	
15:00 – 15:45	Introduction into water technology and management	Harsha Ratnaweera
16:00 – 16:45	Waste water treatment in Chinas cold regions	Nan-Qi Ren
17:00 – 17:45	Fate of novel pollutants in Chinas cold environments	Yifan Li
18:00 – 18:30	Concluding discussions	all

Wednesday June 20th, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Group work and exercises	all
12:00 – 13:00	Lunch	
13:00 – 13:45	To be determined	Ashbold
14:00 – 14:45	To be determined	Johnsson
15:00 – 15:45	Coffee break	
16:00 – 16:45	Anthropogenic pollutants and water treatment in the cold regions	Kallenborn
17:00 – 17:45		Sumarokov
18:00 – 18:30	Concluding discussions	all

Thursday June 21th, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Group work and exercises	all
12:00 – 13:00	Lunch	
13:00 – 13:45	Longyearbyen: Water supply and technologies	n.n.
14:00 – 14:45	Excursion: Longyearbyen water supply and treatment facilities	Kallenborn, Jenssen, Ratnaweera
15:00 – 15:45	Coffee break	
16:00 – 16:45	Long range transport of pollutants versus local sources	Yifan Li
17:00 – 17:45	Identification of local pollutant sources in the Arctic	Roland Kallenborn
18:00 – 18:30	Concluding discussions	all

Friday June 22th, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Group work and exercises	all
12:00 – 13:00	Lunch	
13:00 – 13:45	Decentralised wastewater management	Petter Jenssen
14:00 – 14:45	Pollutants and climate change in the Arctic	Kallenborn, yifan Li
15:00 – 15:45	Coffee break	
16:00 – 18:00	Implications and consequences (discussions)	all

Saturday June 22th, 2018

Time [h]	Topic	Teacher
10:00 – 17:00	Excursion: Billefjord or Barentsburg (Boat access to be negotiated)	all
18:00	Dinner	

Sunday June 23th, 2018

12:30h Departure from UNIS to the airport

