

*First Announcement for the Summer School on:*

## **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 in collaboration with the Water Magic project ([www.watermagic.org](http://www.watermagic.org))*

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

*In collaboration with:*

*University of Alberta (UoA-Can), Canada; University of Alaska (UoA-US), USA; The Technical University of Denmark (DTU); Northern State Medical University (NSMU), Russia and The International Joint Research Centre for Arctic Environment and Ecosystem (IJRC-EAA) at the Harbin Institute of Technology (HIT), China.*

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.

### **Who can participate**

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 water management under the harsh climate conditions of the Arctic.

### **Student registration**

Students may participate in the seminar with or without formally enrolled at NMBU. The seminar is part of the THT 312- Water Management in Cold Climates, a 5 ECTS course at NMBU. If you wish to register for the THT 312 course, please contact Sigrun Vedø ([sigrun.vedo@nmbu.no](mailto:sigrun.vedo@nmbu.no)) before 1<sup>st</sup> April 2018. More information about the course can be found at (<https://www.nmbu.no/course/THT312>)

### **Student fellowships**

There is a limited number of scholarships for students. Students from the organizing institutions will be prioritized. Students that with a relevant background and with a course profile or thesis work geared towards the Arctic and cold climate will be given preference. Please provide a brief letter of interest and what you hope to gain and contribute to the Summer School. Send an application to Petter D. Jenssen with a copy to Roland Kallenborn and Harsha Ratnaweera. **Application deadline April 10.**

### Travel and accommodation

The planes to Svalbard are full in June. Therefore we have prebooked some seats to obtain a lower price. The flights are:

SK4496 Sunday June 17, 2018: Oslo - Longyearbyen 21:45 - 00:40+1

SK4425 Sunday June 24, 2018 Longyearbyen - Oslo 14:45 - 18:55

Price of the return flight is around 3 300 NOK.. We hope to offer accommodation at the student hostels of UNIS. The cost will be about 160-200 NOK/night (room only) in single rooms with shared WC/bath and kitchen.

If you are interested to reserve a seat on the above flights or/and a room at the student hostel, please contact Elisabeth Hoff ([elisabeth.sundheim.hoff@nmbu.no](mailto:elisabeth.sundheim.hoff@nmbu.no)) asap, as these will be awarded on first come basis.

Please note that Spitsbergen is not a part of the Schengen agreement. So if you need a visa to Norway, you will require a dual entry visa to Norway/Schengen.

Accommodation will be organized in student and staff facilities of the University of Svalbard.

### Cost

The scholarship for students will cover the airfare Oslo-Longyearbyen and return. The lodging and main meals in Longyearbyen are also covered.

### Teachers and organizing institutions:

NMBU:	Roland Kallenborn: <a href="mailto:roland.kallenobrn@nmbu.no">roland.kallenobrn@nmbu.no</a>
	Petter Jenssen: <a href="mailto:petter.jenssen@nmbu.no">petter.jenssen@nmbu.no</a>
	Harsha Ratnaweera: <a href="mailto:harsha.ratnaweera@nmbu.no">harsha.ratnaweera@nmbu.no</a>
	Arve Heistad: <a href="mailto:arve.heistad@nmbu.no">arve.heistad@nmbu.no</a>
	Petter H. Heyerdahl: <a href="mailto:petter.heyerdahl@nmbu.no">petter.heyerdahl@nmbu.no</a>
	Manoj Pandey: <a href="mailto:manoj.pandey@nmbu.no">manoj.pandey@nmbu.no</a>
UoA-Can	Nick Ashbolt: <a href="mailto:ashbolt@ualberta.ca">ashbolt@ualberta.ca</a>
UoA-US	Rhonda Johnson: <a href="mailto:rmjohnson2@uaa.alaska.edu">rmjohnson2@uaa.alaska.edu</a>
NSMU	Yury Sumarokov: <a href="mailto:sioury@mail.ru">sioury@mail.ru</a>
DTU:	Pernille Erland: <a href="mailto:pej@byg.dtu.dk">pej@byg.dtu.dk</a>
IIRC-AEE_HIT:	Yifan Li: <a href="mailto:dr_li_yifan@163.com">dr_li_yifan@163.com</a>



## Tentative Program

**Time and location: June 18<sup>th</sup> – 25<sup>th</sup>, University Centre in Svalbard (UNIS), main lecture hall “Møysalen**

### Monday June 18<sup>th</sup>, 2018

21:45 h Departure from OSL to Longyearbyen, SK4496  
 00:40 h Arrival and registration and check-in at the student hostel “Sjøskrenten”

### Monday June 18<sup>th</sup>, 2018

Time [h]	Topic	Teacher
10:00 – 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 exercises) Assignments and timeline	Petter Jenssen/ Harsha Ratnaweera/ Roland Kallenborn/ Yifan Li
14:00 – 15:00	Introduction to water management in cold climate (technology, environment, health and risk)	Kallenborn, Jenssen, Ratnaweera et al.
15:00 – 15:30	Coffee break	
15:00 – 18:00	Introduction to water management in cold climate (technology, environment, health and risk) continued	Kallenborn, Jenssen, Ratnaweera et al.
18:00 – 18:30	Concluding discussions	all

### Tuesday June 19<sup>th</sup>, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Excursion: Longyearbyen water supply and treatment facilities Introduction to group work	Kallenborn, Jenssen, Ratnaweera et al.
12:00 – 13:00	Lunch	
13:00 – 15:00	Environmental issues in the arctic	Kallenborn/Erland Jensen/ Yifan Li
15:00 – 15:30	Coffee break	
15:30 – 17:00	Environmental issues in the arctic	Kallenborn/Erland Jensen
17:00 – 18:00	Fate and distribution of pollutants in the Northern Environments	Yifan Li
18:00 – 18:30	Concluding discussions	all

### Wednesday June 20<sup>th</sup>, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Water supply in arctic climate	Ratnaweera, Erland Jensen, Heistad
12:00 – 13:00	Lunch	
13:00 – 14:00	Wastewater management in Arctic climate	Jenssen, Heistad, Erland Jenssen, Ratnaweera, Ashbolt
14:00 – 15:00	Waste water Treatment in Chinas Cold regions	Nan-Qi Ren
15:00 – 15:30	Coffee break	
15:30 – 18:00	Wastewater management in Northern climate	Jenssen, Heistad, Erland Jenssen, Ratnaweera, Ashbolt
18:00 – 18:30	Implications and consequences (discussions)	all

### Thursday June 21<sup>th</sup>, 2018

Time [h]	Topic	Teacher
09:00 – 12:00	Risk assessment and health	Ashbolt/Johnson/Heistad
12:00 – 13:00	Lunch	
13:00 – 15:00	Risk assessment and health Continued incl. exercise	Ashbolt/Jonhson/Heistad
15:00 – 15:45	Coffee break	
16:00 – 16:45	Sociological issues	Sumarokov
17:00 – 17:45	Energy aspects of living in the arctic	Heyerdahl
18:00 – 19:30	Group work with teacher facilitation	All

### Friday June 22<sup>nd</sup>, 2018

Time [h]	Topic	Teacher
09:00	Exam for participants who have registered for the THT 312 course at NMBU	Ratnaweera
10:30 – 12:00	Presentations of group work 10 groups 10min presentation and 5 min discussion per group (10-12 groups of 5 students total)	All
12:00 – 13:00	Lunch	
13:00 – 16:00	Presentations of group work 10 groups 10min presentation and 5 min discussion per group	All
16:00 – 17:30	Coffee break, final discussions and course summary	All

### Saturday June 22<sup>th</sup>, 2018

Time [h]	Topic	Teacher
10:00 – 17:00	Excursion: Billefjord or Barentsburg (Boat access to be negotiated, , a fee may be payable)	All
18:00	Dinner	

### Sunday June 24<sup>th</sup>, 2018

12:30h Departure from UNIS to the airport

14:45 Departure from Longyearbyen

18:55 Arrival Oslo Gardermoen

