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Centers for Advanced Studies in Water



Mehran University of Engineering & Technology, Jamshoro

GRADUATE SEMINAR SERIES # 13

Providing Safe Drinking Water to Consumers: Options and Challenges



By Christine Pomeroy
&
Jim VanDerslice
October 17th, 2016

Partnering Universities:



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1. Graduate Seminar Series

Graduate seminar series is a regular features of at USPCAS-W. These seminars are usually organized on weekly basis. The main aim of these seminars are to keep students and faculty updated about the latest advancements in the field of research, facts and trends in water and related sectors. Experts from all over the country are invited to deliver lectures & presentations and give talks on the most emerging water related issues and the best practices adopted worldwide in addressing those issues.

So far; the center has organized following seminars;

S. No.	Topic	Speaker(s)/Presenter(s)	Date
1	Spate Irrigation: Potential and Challenges in Sindh	Mr. Karim Nawaz Baloch, Water Expert from Balochistan Dr. Kamran Ansari, USPCAS-W Dr. Altaf Ali Siyal, USPCAS-W	4/9/2015
2	Health, Safety and Environment	Engr. Nizamuddin Domki, HSE Trainer	18/09/2015
3	Impact of Climate Change on Water Resources of Sindh Province	Senator Nisar A. Memon Dr. Ghulam Rasul, Pakistan Meteorological Department	5/11/2015
4	Water quality around us: Overview of situation in Hyderabad and Tharparkar	Prof. Dr. Muhammad Iqbal Bhanger , University of Karachi	12/11/2015
5	Water: Resources , Issues and Management	Prof. Dr. Iqbal Ahmed Panhwar, Bahria University Karachi	11/12/2015
6	How to review research paper & write a research proposal	Dr. Sajjad Ahmad, University of Nevada, Los Vegas USA	22/01/2016
7	Empowering the Irrigation Reforming Institutions in Sindh	Mr. Nazeer A. Essani General Manager (Transition) Sindh Irrigation Drainage Authority	29-1-2016
8	Sustainable Development and WEF Nexus		12-02-2016
9	“Linkages between Engineering Research and Entrepreneurship”	Dr. Shahid Qureshi IBA Sukkur	01-04-2016
10	Hydrology and water resources	Dr. Habib ur Rehman	29-04-2016



	engineering		
11	Urban climate research: application of remote sensing and GIS	Dr. Haroon Stephen Assistant Professor Civil and Environmental Engineering Director GIS and Remote Sensing Core Lab University of Nevada, Las Vegas	06-06-2016
12	GLOF mapping and risk assessment in Hunza river basin using geospatial techniques	Dr. Arjumand Zaidi Assistant Professor National Centre for Remote Sensing & Geo Informatics Institute of Space Technology	2-9-2016
13	Providing Safe Drinking Water to Consumers: Options and Challenges	Christine Pomeroy & Jim VanDerslice	October 17, 2016

2. Speaker's profile

Christine Pomeroy

Christne A. Pomeroy is an Associate Professor in the Urban Water Engineering & Sustainability Group in the Department of Civil and Environmental Engineering at the University of Utah, where she teaches courses in hydraulics, open channel flow, stormwater management and design, water distribution system analysis, and urban watershed management. She has more than 15 years of academic and consulting experience in stormwater management, watershed management, permitting and compliance, modeling, GIS applications in water resources, hydraulics and hydrology. Dr. Pomeroy earned a B.S. in Civil Engineering from Michigan State University in 1995, a M.S. in Civil Engineering in 2004, and a Ph.D. in Civil Engineering in 2007 from Colorado State University. She is a registered professional engineer in Michigan.



Jim VanDerslice Ph.D.

Jim VanDerslice is an Associate Professor in the Department of Family And Preventive Medicine, University of Utah. Along with that he also serves as Research Associate Professor, Health Promotion and Education, University of Utah; and also serves as Adjunct Associate Professor, Biomedical Informatics Research, University of Utah. Dr. Jim VanDerslice has been an avid researcher and a very well published author. He has many researches to his credit and is still in process of carrying out many new researches.





3. Providing Safe Drinking Water to Consumers: Options and Challenges

Welcome remarks by Dr. Kamran Ansari

The proceedings started with the recitation of Holy Quran. Prof. Dr. Kamran Ansari, Deputy Project Director USPCAS-W welcomed all the participants. The participants included not only faculty members and students but also included a large number of hydraulics enthusiasts as well.

Seminar proceedings

On Monday, October 17, 2016, Christine Pomeroy and Jim VanDerslice, senior faculty members from University of Utah, delivered the seminar on **“Providing Safe Drinking Water to Consumers: Options and Challenges”**.

Dr. Jim VanDerslice – the opening speaker of the seminar started the session in his usual calm and student friendly demeanor. He highlighted the problems associated with the supply of clean drinking water to the consumers. He discussed the problems in the context of USA and Pakistani perspective. Dr. Jim VanDerslice gave his own valuable thoughts to the potential solutions to the above mentioned problems. He encouraged student participation and introduced a couple of participant activities as well.

Christine Pomeroy – the second speaker of the day informed the students about the latest developments in the pursuit of supply of clean drinking water to the students. Her talk was accentuated with the latest researches in the relevant field. She informed the participants about her upcoming survey in the context of “MUET Clean Water Project”.

Closing remarks

Dr. Kamran Ansari, Deputy Project Director USPCAS-W thanked all the faculty members and students for their active participation. He said that such effective and informative seminars have been a tradition at the USPCAS-W, and expressed his desire to continue this worthy tradition forward.

4. Picture gallery





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Annexure: Presentation



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Providing Safe Drinking Water to Consumers: Options and Challenges

Christine Pomeroy & Jim VanDerslice

October 17, 2016

Potable drinking water is crucial to maintaining health.

{The United Nations General Assembly} Recognizes the **right to safe and clean drinking water** and sanitation as a human right that is essential for the full enjoyment of life and all human rights.



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How do we do it?



- For the next minute, work in pairs to identify at least two ways for consumers to obtain safe drinking water.
- Be creative.
- Be prepared to share your ideas.

How do we do it?



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Drinking Water in the U.S.

85% served by Community Water Systems
15% by "private wells" -
fewer than 25 people



Community Water Systems: 1 strategy

Must provide high quality water at the tap 24/7.

What is needed to achieve this?

1.



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Private Water Systems: No strategy

Testing only required when well is drilled or when property is sold.
No other requirements

1. Testing once
2. ???

What do you know about drinking water on YOUR campus?



- For the next three minutes, work in pairs to draw a schematic describing the way the water gets to the water cooler in this building.
- Be prepared to share your ideas.



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MUET Water System

Source to Tap

1.

MUET Water System

What is the current status of the system?

- What do you think is working?
- What needs improvement?
- How would you assess this?



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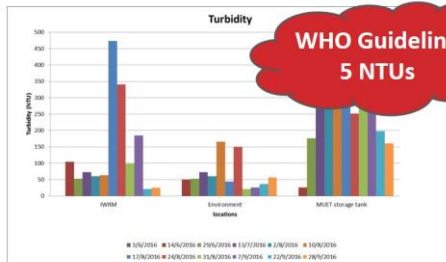
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Water Quality Monitoring



Water Quality Monitoring

Microbiological Results - May 2016

WHO Guideline < 1 colony / 100 ml

Escherichia coli
62 colony forming units/100 ml



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So...what do we do about it?



MUET Clean Water Project

Vision

Ensure "access to safe drinking water for all at campus" in the context of a broader initiative to become a living laboratory for education & research.



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Clean Water Project

Activities

- Assess performance of the current system.
- Redesign system, as necessary.
- Develop operational procedures.
- Train operational staff.



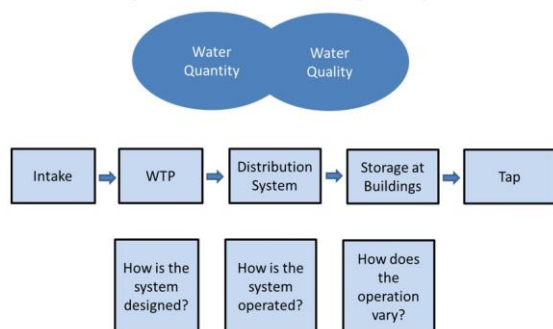
Project Phasing



Study of Existing System (MUET/UU) SUMMER/FALL 2016
Preliminary Design (MUET/UU) WINTER 2017
Final Design (contractor) SPRING 2017
Construction (contractor) SUMMER 2017
Operational Training (MUET/UU) FALL 2017
Study of Improved System ONGOING



Study of Existing System



How can YOU get involved?

Living Laboratory Research Opportunities

- Source water characterization and implications for design including physical, chemical, microbiological.
- Characterize settling of particulates/colloids, as a function of coagulant type, dosage, seasonal variability.



What is needed?

Engineering Design



- For the next three minutes, work in pairs to identify at least 5 pieces of information needed for the design of a new system.
- Be prepared to share your ideas.



How can YOU get involved?

Living Laboratory Research Opportunities

- Assess POU treatment: compare bacteria in drinking water (cooler) and nearby tap.
- Characterize changes in bact water quality/ turbidity along treatment and distribution system.



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How can **YOU** get involved?

Living Laboratory Research Opportunities

- Impact of storage tank residence times on bact/water quality.
- Conduct detailed water use assessment: diurnal/weekly/seasonal.
- Assess operator training; describe training competency needs.

How can **YOU** get involved?

Living Laboratory Research Opportunities

- Characterize appliance water loss at the campus: leaking pipes, tank overflow, inefficient irrigation, leaking faucets, toilets, estimate repair effort, costs, examine maintenance training management.



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How can **YOU** get involved?

Living Laboratory Research Opportunities

- We want to hear **YOUR** ideas!

What is happening this week?

System Characterization

- Water quantity and quality assessment of distribution system.
- How much water is going where?
- Can we identify losses?
- Get a handle on storage tank impacts.



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How can **YOU** get involved?

Field data collection effort - **Wednesday**

- Help from **EVERYONE**
- Tanks all over campus
- Tank characteristics
- Water levels

Wednesday Schedule

08:30 - 10:00	8:30 am classes (1 st yr)
10:00 - 10:30	Site assignment & training
10:30 - 11:00	Transit to sites
11:00 - 11:30	Initial data collection
11:30 - 12:30	Incremental data collection
12:30 - 13:00	Transit to ORIC
13:00 - 13:30	Break
13:30 - 15:00	11:45 am classes (1 st yr)
13:30 - 15:00	01:00 pm classes (2 nd yr)



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Options for Improvement

