



MONASH



CRC for
Water Sensitive Cities

Undergraduate PIRE Program Down Under for Water Sustainability

UPP Down Under!

June 24th: Student Orientation & Preliminaries

2:00PM – 5:00PM: Orientation (Engineering Gateway, Room 4171, UC Irvine)

June 25th: Lectures on Climate Change, Economics and Governance

7:30AM – 8:00AM: Continental Breakfast Served (Engineering Gateway, Room 4171, UC Irvine)

8:00AM – 9:00AM: Climate Change & Drought in California (Z. Hao)

9:10AM – 10:10AM: The Millennium Drought in Victoria (S. Grant)

10:20AM – 11:20AM: Water and Economics (J.D. Saphores)

11:30AM – 12:30PM: Water and Government (D. Feldman)

12:30PM – 1:00PM: Lunch

1:00PM – 1:30PM: Travel Time to LACSD

1:30PM – 4:30PM: Tour of LACSD (D. Feldman)

4:30PM – 5:00PM: Travel Time back to UCI

June 26th: Lectures on Wastewater Treatment and Reuse

7:30AM – 8:00AM: Continental Breakfast Served (Engineering Gateway, Room 4171, UC Irvine)

8:00AM – 9:00AM: Domestic Wastewater Reuse (S. Jiang)

9:10AM – 10:10AM: Constructed Wetlands for Wastewater Treatment (P. Bowler)

10:20AM – 11:20AM: Wastewater and Energy (J. Brouwer)

11:30AM – 12:30PM: Wastewater and Climate Change (D. Rosso)

12:30PM – 1:00PM: Lunch

1:00PM – 1:30PM: Travel Time to OCWD GWRS/OCSD

1:30PM – 4:30PM: Tour OCWD GWRS/OCSD (J. Brouwer, D. Rosso)

4:30PM – 5:00PM: Travel time back to UCI

June 27th: Lectures on Stormwater Capture and Reuse

7:30AM – 8:00AM: Continental Breakfast Served (Engineering Gateway, Room 4171, UC Irvine)

8:00AM – 9:00AM: Stormwater Runoff and the Urban Stream Syndrome (K. Schiff)

9:10AM – 10:10AM: New Stormwater Regulations in the OC (R. Boon)

10:20AM – 11:20AM: Natural Treatment Systems at UCI (R. Demerjian)

11:30AM – 12:30PM: Tour of UCI's Stormwater Capture Reuse Projects (R. Demerjian)

12:30PM – 1:00PM: Lunch

1:00PM – 2:00PM: Constructed Wetlands for Stormwater Treatment (P. Bowler)

2:00PM – 2:30PM: Travel Time to San Joaquin Marsh

2:30PM – 4:30PM: Tour of UCI's San Joaquin Marsh

4:30PM – 5:00PM: Travel time back to UCI

June 28th: Travel to Australia

4:00PM: Early Dinner (*bring luggage*)

6:00PM: Super Shuttle Pickup



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June 30th: **Check-in at Trinity College, University of Melbourne, Parkville, Victoria**

July 1st: **Field trip to the World's largest Wastewater Stabilization Pond**

- 9:00AM: Meet at the Vasey Laboratory, Department of Infrastructure Engineering, University of Melbourne, Parkville, Victoria
9:15AM – 10:30AM: A brief history of Melbourne's Water Supply and Wastewater Treatment (A. Hamilton)
10:30 AM – 4:00 PM: Guided tour of the Werribee Treatment Facility (A. Hamilton and Melbourne Water)

July 2nd: **Safety Orientation and Science and Practice of Field Measurements**

- 9:00AM – 10:00 AM: Vasey Laboratory Safety Orientation (S. Adams)
10:00AM – 11:00 AM: Overview of UPP Down Under Field Program (S. Grant)
11:00AM – 1:00 PM: Measuring Indicator Bacteria and Pathogens (S. Jiang)
1:00PM – 3:00 PM: Characterizing Plant and Animal Communities in Wetland Systems (A. Mehring)
3:00PM – 5:00 PM: Measuring TSS, chlorophyll, nutrients, and PAR in wetlands (M. Rippy)

July 3rd: **Field Excursion #1: Royal Park Treatment Wetland, Parkville, Victoria**

- 9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork
10:00AM – 4:00 PM: Field expedition to the Royal Park Wetland.
- Water Quality Team (M. Rippy): Laura Weiden, Amanda Jimenez, Ava Moussavi-Aghdam
 - Pathogen Team (S. Jiang): Cameron Patel, Edgar Gomez
 - Sensor Team (S. Grant): Alex McClusky, Emily Parker, Garfield Kwan, Jessica Satterlee, Kevin Tran
 - Ecology Team (A. Mehring): Nicole Patterson, Kim Duong, Maria Castillo, Norma Galaviz, Sam Zabb-Parmley
- 4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)

July 4th: **Field Excursion #2: Hampton Park Treatment Wetland, Hampton Park, Victoria**

- 7:45AM – 9:00 AM: Breakfast meeting with Head of Department of Infrastructure Engineering (A. Rajabifard), Deputy Dean of the Melbourne School of Engineering (P. Scales), Discipline Leader for Environmental Engineering (M. Stewardson), A/Prof in Environmental Engineering (Graham Moore), Lecturer in Environmental Engineering (Meenakshi Arora), and Manager of Technical and EHS Services for the Melbourne School of Engineering (Michelle Mackay).
- 9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork
10:00AM – 4:00 PM: Field expedition to the Hampton Park Wetland.
- Water Quality Team (M. Rippy): Emily Parker, Kim Duong, Ava Moussavi-Aghdam
 - Pathogen Team (S. Jiang): Laura Weiden, Norma Galaviz, Cameron Patel, Maria Castillo,
 - Sensor Team (S. Grant): Nicole Patterson, Amanda Jimenez, Edgar Gomez, Alex McClusky, Kevin Tran
 - Ecology Team (A. Mehring): Jessica Satterlee, Garfield Kwan, Sam Zabb-Parmley
- 4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)



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July 5th: **Field Excursion #3: Wikes Reserve Biofilter, The Basin, Victoria**

9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork

10:00AM – 4:00 PM: Field expedition to the Wikes Reserve Biofilter.

- Water Quality Team (M. Rippy): Emily Parker, Edgar Gomez, Sam Zabb-Parmley
- Pathogen Team (S. Jiang): Laura Weiden, Norma Galaviz, Jessica Satterlee
- Sensor Team (S. Grant): Nicole Patterson, Kim Duong, Maria Castillo, Cameron Patel
- Ecology Team (A. Mehring): Alex McClusky, Garfield Kwan, Ava Moussavi-Aghdam, Kevin Tran, Amanda Jimenez

4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)

July 6th: **Laboratory Catch-up Day**

9:00AM – onward: Meet in Vasey Laboratory to catch up on laboratory analyses and data reduction

July 7th: **Free Day**

4:00PM-onward: Footy Game in the MCG (Geelong versus Hawthorne)

July 8th: **Field Excursion #4: Lynbrook Estates Biofilter and Constructed Wetland, Lynwood, Victoria**

9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork

10:00AM – 4:00 PM: Field expedition to the Lynbrook Estates.

- Water Quality Team (M. Rippy): Garfield Kwan, Edgar Gomez, Maria Castillo
- Pathogen Team (S. Jiang): Laura Weiden, Jessica Satterlee, Ava Moussavi-Aghdam, Kevin Tran
- Sensor Team (S. Grant): Nicole Patterson, Kim Duong, Norma Galaviz, Sam Zabb-Parmley,
- Ecology Team (A. Mehring): Alex McClusky, Emily Parker, Cameron Patel, Amanda Jimenez

4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)

July 9th: **Field Excursion #5: Edithvale Natural Wetland, Edithvale, Victoria**

9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork

10:00AM – 4:00 PM: Field expedition to the Edithvale.

- Water Quality Team (M. Rippy): Jessica Satterlee, Norma Galaviz,
- Pathogen Team (S. Jiang): Laura Weiden, Garfield Kwan, Edgar Gomez, Amanda Jimenez
- Sensor Team (S. Grant): Nicole Patterson, Emily Parker, Maria Castillo, Sam Zabb-Parmley
- Ecology Team (A. Mehring): Alex McClusky, Ava Moussavi-Aghdam, Kim Duong, Kevin Tran
Cameron Patel

4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)

July 10th: **Field Excursion #6: Hereford Biofilter, Mount Evelyn, Victoria**

9:00AM – 10:00 AM: Meet in Vasey Laboratory to prepare for fieldwork

10:00AM – 4:00 PM: Field expedition to Mount Evelyn.

- Water Quality Team (M. Rippy): Kevin Tran, Cameron Patel
- Pathogen Team (S. Jiang): Laura Weiden, Kim Duong, Sam Zabb-Parmley, Emily Parker
- Sensor Team (S. Grant): Nicole Patterson, Ava Moussavi-Aghdam, Amanda Jimenez, Garfield Kwan, Norma Galaviz
- Ecology Team (A. Mehring): Alex McClusky, Edgar Gomez, Jessica Satterlee, Maria Castillo

4:00PM – Onward: Laboratory analysis and data reduction (Vasey Laboratory)



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Program for Day 1 of the Mini-Symposium: Stormwater Management

Date: Thursday 11th July

Venue: MSI Conference Room, Monash Sustainability Institute, Building 74

8:10-8:30 AM: Welcome – Stan Grant

8:30-9:00 am: Overview of PIRE – Stan Grant

9:00-9:35 am: Overview of Monash Water for Liveability, CRC for Water Sensitive Cities and stormwater research at Monash - Ana Deletic (25 mins presentation + 10 mins discussion)

9:35-10:00 am: “Pathogens in biofilters: current designs” - Gayani Chandrasena (20 mins presentation + 5 mins discussion)

10.00-10.25 am: “Pathogens in biofilters: novel designs” - Yali Li (20 mins presentation + 5 mins discussion)

10.25-10.50 am: “Miroppollutants in biofilters and validation” - Kefeng Zhang (20 mins presentation + 5 mins discussion)

10.50 -11.10am BREAK

11.10 - 11.30am: “Biofilter design for effective nitrogen removal from stormwater” - Emily Payne (15 mins presentation + 5 mins discussion)

11.30- 11.50am: “Passive disinfection of harvested stormwater” - Wenjun (Kent) Feng (15 mins presentation + 5 mins discussion)

11.50 - 12.10am: “Multifunctional biofilters- moving away from stormwater” - Harsha Fowdar (15 mins presentation + 5 mins discussion)

12.10 - 12.35pm - LUNCH

12.35 - 2.00 pm - Visit to Monash labs: Greenhouse, Monash carpark biofilter, Hydraulic Lab, EPHEM lab

2.00 - 2.20pm: “Removal of Adenovirus and Indicator Bacteriophages by Stormwater Biofilters” - Sunny Jiang, on behalf of Eric Huang

2.20 - 2.40pm: “Invertebrates and pollutant removal in biofilters” - Andrew Mehring

2.40 - 3.00pm: “Characterization and Function of Wetland and Biofilter Surface Microlayers” - Laura Weiden

3.00pm - 4pm: Collaboration opportunities - general discussion



Date: Thursday 12th July

Venue: MSI Conference Room, Monash Sustainability Institute, Building 74

MORNING SESSION – 9:00 AM – 12:30 PM

9:00 AM – 9:15 AM: Overview and Welcome – Professor Jean-Daniel Saphores (UC Irvine).

9:15 AM – 10:00 AM: Professor Jo Lindsay (Convener of Sociology and Gender Studies, President of the Australian Sociological Association, and Professor of Sociology, Monash University). **Changing water cultures to achieve water sensitive cities.**

10:00 AM – 10:45 AM: Professor Rebekah Brown (Director, Urban Water Transitions and Governance, Monash Water for Livability, Program Leader - CRC for Water Sensitive Cities, Professor, School of Geography and Environment, Monash University). **Urban water and sustainability transitions – technology innovation, development and diffusion processes.**

10:45 AM – 11:00 AM: Break

11:00 AM – 11:45 AM: Paul Raschky (Department of Economics, Faculty of Business and Economics, Monash University). **Non-market valuation and water related non-market goods on sustainability.**

11:45 AM – 12:30 PM: Professor Jean-Daniel Saphores (Department of Civil and Environmental Engineering, UC Irvine). **Attitudes toward water recycling and reuse – some preliminary results from the US.**

12:30 PM – 1:30 PM: LUNCH

AFTERNOON SESSION – 1:30 PM – 4:45 PM

1:30 PM – 2:15 PM: Professor Lionel Frost (Department of Economics, Faculty of Business and Economics, Monash University). **History of water use, sanitation and the evolution of urban areas – focus on Australia and the Asia-Pacific region.**

2:15 PM – 3:00 PM: Professor David Feldman, Department of Planning, Policy and Design, UC Irvine. **Applicability to the US of Australian experience on water reuse and conservation: obstacles and opportunities.**

3:00 PM – 3:15 PM: Break

3:15 PM – 4:15 PM: **Issues related to water re-use: a roundtable discussion**

- Professor Ana Deletic, Department of Civil Engineering and Institute for Sustainable Water Resources – Monash University.
- Professor Rebekah Brown, School of Geography and Environment – Monash University.
- Professor Jean-Daniel Saphores, Department of Civil and Environmental Engineering, UC Irvine.
- Professor David Feldman, Department of Planning, Policy and Design, UC Irvine.

4:15 PM – 4:30 PM: Professor David Feldman (UCI): Synthesis of lessons and summary.



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July 13th: **Free Day in Melbourne**

July 14th: **Travel back to Southern California**

July 15th: **Free Day in Southern California**

July 16th: **Molecular Detection of Microbial Pathogens and Quantitative Microbial Risk Assessment**

9:00 AM: Arrive Environmental Engineering Teaching Lab, Engineering Tower 305
9:00 – 10:20AM: Molecular Detection of Microbial Pathogens, theory and practice (Sunny Jiang)
10:20 – 10:30AM: Break
10:30 – 11:50AM: Quantitative Microbial Risk Assessment (Keah Ying Lim)
11:50 – 1:30PM: Lunch break
1:30 – 5:00PM: Demonstration and practice of genome DNA extraction, PCR set up and gel electrophoresis (Eric Huang, Sunny Jiang)

July 17th: **Tools for Analyzing Environmental Measurement: Basic Statistics**

10:00 AM: Arrive at CCE conference room; **EG 4171**
10:00-11:00 AM: General Statistics Lecture – Part 1 (Andrew Mehring)
11:00 – 11:10 AM: Break
11:10 – 12:00 PM: General Statistics Lecture – Part 2 (Andrew Mehring)
12:00 – 1:30 PM: Lunch break
1:30 – 2:30 PM: General presentation of available UPP Down Under Datasets (Stanley Grant)
2:30PM: Reconvene at computer lab, **ECT 123**
2:30 – 5:00 PM: Brainstorming Poster and Movie Design (Unsupervised discussion)

July 18th: **Tools for Analyzing Environmental Measurement: Advanced Statistical Toolsets**

10:00 AM: Arrive at conference room **EG 3161**
10:00-11:00 AM: Non parametric statistical tests and boot-strap methods – Part 1 (Megan Rippy)
11:00 – 11:10 AM: Break
11:10 – 12:00 PM: Principal Component Analysis and Generalized Linear Models – Part 2 (Megan Rippy)
12:00 – 1:30 PM: Lunch break
1:30 – 5:00 PM: Data Analysis and Graphing for Posters; **ECT 123** (Megan Rippy)

July 19th: **Communicating Science; Scientists, Educators, and the General Public**

10:00 AM: Arrive at conference room **EG 3161**
10:00-10:50 AM: Communicating Science; talks, posters, and papers (Megan Rippy & Alison Cawood)
10:50 – 11:00 AM: Break
11:00 – 12:00 PM: Communicating Science; education, outreach, and the public (Alison Cawood)
12:00 – 1:30 PM: Lunch break
1:30 – 5:00 PM: MORE Data Analysis and Graphing for Posters; **ECT 123** (Megan Rippy)



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July 22nd: **Visit Scripps Institution of Oceanography**

- 7:45 AM: UCLA & UCI students meet at UCI for transportation to SIO
- 9:30 AM: Arrive at SIO
- 9:30-10:30 AM: Tour of SIO and collections visit.
- 10:30-11:30 AM: Pier walk followed by lab tours
- 11:30-12:30 PM: Class room microscope observations
- 12:30-2:00 PM: Lunch and fun on the beach
- 2:00 - 4:00 PM: Tour of the Aquarium and Oceanography museum
- 4:00 PM: Depart for Irvine (expected return by 6:00 PM)

July 23rd: **Environmental Sustainability and Data Analysis**

- 10:00 AM: Arrive at conference room **EG 3161**
- 10:00-11:00 AM: Wetland Plants: Part 1 (Brandon Winfrey)
- 11:00 – 11:10 AM: Break
- 11:10 – 12:00 PM: Wetland Plants: Part 2 (Brandon Winfrey)
- 12:00 – 1:30 PM: Lunch break
- 1:30 – 3:00PM: Data Analysis and Graphing for Posters; **EH 1141** (Megan Rippy & Stan Grant)
- 3:00 PM: Attend sustainability conference (walk to Sustainability Conference, **EDU1111, Berkeley Place**)
- 3:15 PM: **Interactions Between Biodiversity and Climate Change : The Challenge of Environmental International Regimes and National Policies on the Amazon Region** Solange Teles da Silva, Professor of Environmental Law, Universidade Presbiteriana Mackenzie.
- 4:00 PM: **Sustainability and Rainwater Harvesting in the Context of Climate Change** Ezgi Ferrand, Assistant Professor of Geography at Southern Connecticut State University.
- 4:30 PM: **Developing a Unifying Ethic for Sustainability** Jesse Baker, Founder of Ecoefficiency.

July 24th: **Environmental Sustainability and Data Analysis**

- 10:00 AM: Arrive at conference room **EG 3161**
- 10:00 – 12:00PM: Data Analysis: MLR &Virtual Beach; **EG 3161** (Megan Rippy & Stan Grant)
- 2:00 PM: **Rural Urbanization in China: Better Life or False Hope?** Andrew Stokols
- 2:30 PM: **Urban Transformation of the Metropolitan İstanbul in the Sustainability Context.** Çiğdem Yilmazer,
- 3:00 PM: Coffee Break
- 3:15 PM: **Don't Stay Out of the Kitchen.** Kong Sham.



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July 25th: **Environmental Sustainability and Data Analysis**

9:00 AM: Nuclear Energy: **Current challenges and potential applications.** Jeremy Pearson, PhD.
9:30 AM: **Innovation and Accountability: The University of California for Clean Energy** Ross Zelen.
10:15 AM: Coffee Break
10:30 AM: **One World One Ocean: Marine Education and Protection.** Sarah Bedolfe and Kimmy Helling.
11:00 AM: **The Global Water Crisis.** UCI Hydrology Research Group.
12:00– 1:30 PM: Lunch Break
1:30 – 5:00 PM: Data Analysis and Graphing for Posters; **ECT 123** (Megan Rippy and Stan Grant)

July 26th: **Data Analysis**

Morning Free
12:00 – 5:00 PM: Data Analysis and Graphing for Posters; **EH 1141** (Megan Rippy and Stan Grant)

July 29th: **Data Analysis**

Morning Free
12:00 – 5:00 PM: Data Analysis and Graphing for Posters; **EH 1141** (Megan Rippy and Stan Grant)

July 30th: **Data Analysis**

Morning Free
12:00 – 5:00 PM: Data Analysis and Graphing for Posters; **ECT 123** (Megan Rippy and Stan Grant)

July 31st: **Data Analysis**

Morning Free
12:00 – 5:00 PM: Data Analysis and Graphing for Posters; **ECT 123** (Megan Rippy and Stan Grant)

August 1st: **UPP Down Under Symposium (details TBD)**