

## General Information

The course will comprise a combination of presentations and practical demonstrations. Delegates will be encouraged to bring samples for both data acquisition and analysis.

Throughout the course there will be ample opportunity for discussing the participants own data and data analytical problems.

**Cost:** Student AUD 250  
Academic AUD 500  
Industry AUD 900

**Location:** Rm. 109, Building H20 Civil and Environmental Engineering, UNSW, Sydney

**Times:** 9.am—5pm, February 24-25th 2009

**Accommodation:** The Randwick Lodges, Randwick  
Tel: (02) 9314 6686 / (02) 9314 5553 / (02) 9399 7779  
<http://www.therandwicklodges.com/>

Barker Lodge Motor Inn, 32 Barker Street, Kingsford  
Tel: (02) 9662 8444  
<http://www.barkerlodge.com.au>

**Contact:** [water@unsw.edu.au](mailto:water@unsw.edu.au)

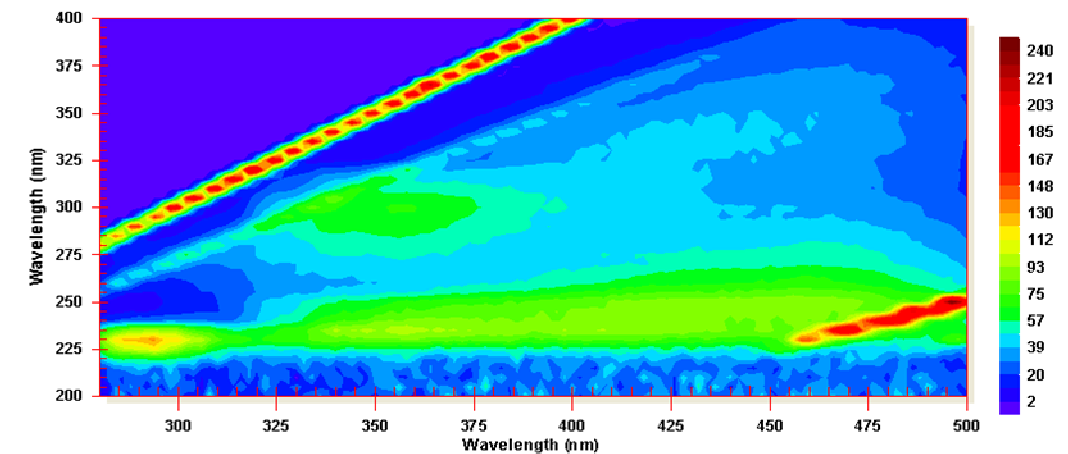
**Supported by:** ARC LP0776347 Fluorescence as a tool for sensitive detection of failures in recycled water treatment and distribution systems



2-Day Workshop



# Acquiring and Analysing Fluorescence Data for Water Quality Assessment



February 24-25th, 2009

UNSW Water Research Centre,  
School of Civil and Environmental Engineering,  
University of New South Wales, Sydney

Contact: [water@unsw.edu.au](mailto:water@unsw.edu.au)

Sponsored by:



The University of New South Wales' Water Research Centre (UNSW WRC) in Sydney, Australia, is hosting a 2-day course designed to teach students, academics and industry delegates the principles of fluorescence, sample handling and fluorescence data acquisition for water quality assessment.

Fluorescence research in the field of water science has increased exponentially over the last decade as instrumentation has improved. Technological advances now enable 3-D excitation-emission spectra to be obtained in less than 1 minute and portability is now possible in the short wavelength, facilitating in-situ measurements for water quality determination. Fluorescence is now being applied as a water quality monitoring tool for a range of environments, including:

- Potable, recycled and wastewater
- Groundwater
- Agricultural waste
- Ships' ballast water
- Landfill leachate
- Rivers/estuaries/marine environments

### Course Presenters

#### Prof. Andy Baker, University of Birmingham, UK

The workshop will be headed by Professor Andy Baker, visiting from the University of Birmingham, UK. Andy is at the forefront of fluorescence analysis for environmental applications. He has authored over 100 scientific papers, books and review articles on the use of fluorescence for applications ranging from groundwater tracing to water treatment and has led or co-led over 40 research projects on the subject. He has coordinated a NERC Knowledge Transfer Network on Fluorescence for the Water Sciences since 2006 and co-convened the American Geophysical Union Chapman conference on Organic Matter Fluorescence. Andy is a former director of the degree of MSc River Environmental Management at Birmingham University, where he currently teaches for the same program and for the degree of MSc Water Resources Technology and Management.



#### Dr. Kate Murphy, UNSW WRC / Smithsonian Environmental Research Centre, Maryland

Kate has 7 years experience with fluorescence data in the field of marine science, where she has published extensively on using fluorescence to trace sources of ships' ballast water. She splits her time between the Smithsonian Environmental Research Centre in the USA and the UNSW WRC. One of Kate's principal research interests is in the application of multivariate techniques to the analysis of fluorescence data. Recently, she headed the fluorescence data analytical component of a global inter-laboratory comparison study investigating organic matter fluorescence.



#### Dr. Rita Henderson, UNSW WRC

Rita is a Research Fellow at the UNSW WRC where she manages an Australian Research Council Linkage Project investigating fluorescence as a monitoring tool for recycled water systems. Her main research interests are in water treatment process science for which she has a number of publications. Rita has 3 years experience in the application of fluorescence for organic matter characterization to determine water quality and process performance in potable, recycled and waste-water treatment systems.



### Course Outline

#### Day 1: Morning

*Introduction to the principles of fluorescence, the advantages of using fluorescence and the instrumentation available*

Fluorescence is an optical technique that is closely related to absorbance but has the advantage of increased sensitivity and selectivity. This session informs delegates about the chemical and physical principles of the fluorescence technique and the advantages of using fluorescence for evaluating water quality. The various instrumental configurations that are available for obtaining fluorescence spectra are described. Demonstrations of two different types of fluorescence instruments, portable and lab-based, will be conducted. Delegates will gain an understanding of fluorescence for water quality applications and learn how to select instrumentation to suit their application.

#### Day 1: Afternoon

*Case studies*

The application of fluorescence to environmental problems will be explained using case studies ranging from water treatment applications to ballast water studies in the marine environment. A variety of data analytical techniques will be described, giving the delegate an overview of the various options available for interpretation.

#### *Sample Analyses*

Delegates will have the opportunity to run their own samples. This will enable the focus of the following session to be directly related to the delegate's area of interest.

#### Day 2: Morning

*Sample handling and data acquisition*

Obtaining accurate, reliable fluorescence data is essential to ensure sound conclusions are reached. This session will address sample collection protocols, the impact of pre-treatment including storage and filtration, and matrix effects including concentration, temperature and pH on the fluorescence spectra. Method development considerations for acquiring fluorescence data will be explained, for example, wavelength choice, scan speed and slit width settings. Participants will be introduced to simple scans, synchronous scans and 3-D excitation-emission matrices (EEMs). Delegates will gain an understanding of sample collection protocols for fluorescence analysis and how to develop methods to obtain the appropriate data.

#### Day 2: Afternoon

*Processing of raw fluorescence data*

Fluorescence data generated by spectrophotometers are instrument dependent until certain correction factors are applied that take account of instrument specific wavelength responses resulting from differences in excitation light sources, monochromators and emission detectors. Fluorescence can also be affected by a phenomenon known as the "inner filtering effect" and corrections for this must be applied prior to interpretation. This session will demonstrate how to correct for such instrument variability and teach delegates how to prepare their data for further interpretation. The delegates own samples will be used as examples.

## Registration Form

### Acquiring and Analysing Fluorescence Data for Water Quality Assessment

February 24-25<sup>th</sup> 2009

UNSW Water Research Centre, The University of New South Wales, Sydney, Australia.

#### Attendee Details

Name		Title	Dr/Mr/Mrs/Ms/Miss
Position		Company	
Address			
Tel		Fax	
Mobile		Email	

#### Registration Category (mark as appropriate)

Student	AUD 250 inc. GST	<input type="checkbox"/>
Academic	AUD 500 inc. GST	<input type="checkbox"/>
Government Research Body	AUD 700 inc. GST	<input type="checkbox"/>
Industry	AUD 900 inc. GST	<input type="checkbox"/>

*Workshop fee includes attendance, lunch, delegate coffee breaks and full workshop documentation.*

*The fee does **not** cover travel and accommodation or other items not listed above.*

#### Credit Card Details

Payment via credit card is preferred. If option to pay via cheque, invoice or EFT is required then please contact the UNSW Water Research Centre as detailed below for further information.

Name of cardholder			
Card number			
Expiry Date		Amount (AUD)	
Signature			

#### Cancellations and Substitutions

It is regretted that cancellations and refunds cannot be made. However, the organisers will accept substitutions provided that written notification is received.

#### Data Protection

Please tick this box if you do not wish your details to be held by The University of New South Wales for the purpose of marketing courses, conferences, research programmes and other associated activities

#### Submit To:

**UNSW Water Research Centre, The University of New South Wales, UNSW, Sydney 2052, Australia. Tel: +61 (0)2 9385 5017; Fax: +61 (0)2 9313 8624; Email: k.dean@unsw.edu.au**