

University of Wolverhampton

TREASURE WATER TRAINING COURSE

"TRANS-REGIONAL ENVIRONMENTAL AWARENESS FOR SUSTAINABLE USAGE OF WATER RESOURCES"

26 JUNE - 8 JULY 2017

MONDAY 26th June 2017

10:00 – 10:30 Welcome from Prof. Craig Williams and Dr. Kate Tobin. Participants' short introduction.

10:30 – 13:00 Faculty of Science and Engineering, University of Wolverhampton. Applied research and knowledge transfer: visiting and testing research and technology laboratories, innovation centers, study facilities and areas.

13:00 – 14:00 Lunch break

14:00 – 17:00 Faculty of Science and Engineering, University of Wolverhampton. Visit to Built Environment, Information Systems and Learning Technology Research Centre.



TUESDAY 27th June 2017

09:00 – 12:00 Moving to the Elan Valley Reservoirs, man-made lakes created from damming the Elan and Claerwen rivers in Mid Wales. Prof. Craig Williams and Dr. Brian Shiplee.

12:00 – 13:00 Site visit to the Caban Coch dam, lowest of the dams: history, construction, potential capacity. Prof. Craig Williams.

13:00 – 14:00 Lunch break

14:00 – 16:00 Site visit to Pen Y Garreg dam, Craig Goch Reservoir. Water filtration works, environmental impact of reservoirs. Dr. Brian Shiplee.

16:00 – 19:00 Return to Wolverhampton.

The Craig Goch Reservoir Dam



WEDNESDAY 28th June 2017

10.00 – 10.50 Trip to Shrewsbury, EA West Midlands, Hafren House, Welshpool Road.

10:55 Arrive at EA West Midlands, Hafren House & collect visitor passes.

11:00 Welcome and Introduction to Flood Risk Management in and UK, Dr. Anne Wheeler: Chair of the English Severn and Wye Regional Flood and Coastal Committee.

Dr. Anne Wheeler with an opening presentation on "The role of Regional Flood and Coastal Committees (RFCCs) in England". Dr. Wheeler introduced strategic planning schemes across the whole river catchment to ensure a joined up approach to reducing flood risk for communities across England. The speaker addressed an issue of building partnerships among water companies, Internal Drainage Boards, agencies, institutions, landowners and communities as one of the most important aspects of flood risk management into the future.

11:30 Flood Risk Management in Practice, Richard Bentley, Partnership & Strategic Overview Team Leader, Environment Agency West Midlands.

Richard Bentley presented various aspects of the Environment Agency strategies and initiatives for water sector in England. A strategic overview of the management of all sources of flooding and coastal erosion was submitted by the speaker.



12:10 Travel to Frankwell Car Park. Frankwell is the first area in Shrewsbury where a substantial number of properties are affected by flooding. Drs. Keith Jones and Anne Wheeler.

12:15 Frankwell Flood Alleviation Scheme (FAS), a creative and innovative approach – erecting standardised demountable defences in the event of a flood. Local riverside environment. Observing the construction process. Drs. Keith Jones and Anne Wheeler.

12:40 Visit to Lara’s Tower, Shrewsbury Castle located on a hill in the neck of the meander of the River Severn – view of Shrewsbury and implications of flooding. Drs. Keith Jones and Anne Wheeler.

13:30 Lunch break/Free time

15:00 Return to Wolverhampton



THURSDAY 29th June 2017

10:00 – 12:00 Site visits: West Park with its Lake and the Conservatory, Wolverhampton. The problem of eutrophication as a leading cause of impairment of freshwater ecosystems. Causes, effects and control measures of eutrophication. Prof. Craig Williams and Dr. Kate Tobin.

12:00 – 12:30 Trip to Severn Trent Water, Canal and River Trust, West Midlands Waterways.

12:30 – 13:30 Lunch break

13:30 – 15:00 Exploring the Staffordshire and Worcestershire canals, as vital wildlife corridors that provide valuable habitats and places, Canal and River Trust, West Midlands Waterways. Prof. Craig Williams and Dr. Kate Tobin.

15:00 – 17:00 Bratch Pumping Station and water extraction by Severn Trent. Prof. Craig Williams and Dr. Kate Tobin.

17:00 Return to Wolverhampton



FRIDAY 30th June 2017

10:30 – 11:30 Dr. Kate Tobin "Severn Trent Water. Conservation and sustainability information". Overview of water treatment processes in West Midlands, England: principal objectives, chemical and physical processes involved, basic problems and considerations.

11:30 – 12:30 Meeting with the Dean of Faculty of Science and Engineering, University of Wolverhampton, Prof. Nazira Karodia. Visit to the Science Education Centre.

12:30 – 13:30 Lunch break

13:30 – 14:30 Dr. Brian Shiplee "Fracking & its potential to impact on water resources". Fracking's appeal and potential. Stages of the hydraulic fracturing water cycle. Concerns associated with fracking, potential risks to the water environment.

14:30 – 15:30 Learning Lab. Presentation on "Distance learning. Online education at the University of Wolverhampton". Online learning opportunities, innovative educational platforms, research in e-learning.

15:30 – 16:00 Penrith Field Course lead-up.



SATURDAY 1st July

Free Day

SUNDAY 2nd July 2017

09:00 – 11:00 Move from Wolverhampton to Brockholes that is a part of a local charity, the Lancashire Wildlife Trust. Prof. Craig Williams, Dr. Brian Shiplee.

11:00 – 13:00 Field research of plants, birds, and water management in Brockholes. Prof. Craig Williams, Dr. Brian Shiplee.

Cereal-herb meadow and broad-leaved wood in Brockholes



13:00 – 14:00 Lunch break

14:00 – 17:00 Move from Brockholes to Newton RIGG College two miles westwards Penrith, county of Cumbria

MONDAY 3rd July 2017

09:00 – 11:00 Water resources: assessment methods and criteria. Visit to Thirlmere Tarn, a reservoir of fresh water surrounded by 10,000 acres of fells and 2,000 acres of forest. Main water parameters definition, including temperature, pH, conductivity, nitrites, sulphates, etc. Prof. Craig Williams, Dr. Brian Shiplee.

Field research on the western bank of Thirlmere Tarn



11:00 – 13:00 Climb up the steep slope of the Cumbrian Mountains to Harrop Tarn, a small lake at 301 m above sea level. The lake is situated 10 km northeast of Scafell Pike, which is the highest point in England. Harrop Tarn is connected with Thirlmere Tarn by the brook. Main water parameters definition, including temperature, pH, conductivity, nitrites, sulphates, etc.

Climbing the steep slope of the Cumbrian Mountains to Harrop Tarn



Harrop Tarn. Field research on the eastern bank of Harrop Tarn



13:00 – 14:00 Lunch break in Ambleside town, situated on the northern bank of Windermere

14:00 – 16:00 Visit to Ullswater, one of the largest lakes in England. Main water parameters definition, including temperature, pH, conductivity, nitrites, sulphates, etc.

The Ullswater. Field research on the western bank of the Ullswater



16:00 – 17:00 Move from Brockholes to Newton RIGG College

TUESDAY 4th July 2017

09:00 – 12:30 Water resources: assessment methods. Visiting the Glenderamackin River near the Trout Beck. Main water parameters definition, including the width (in every metre), depth (in every metre), flow rate and discharge, temperature, pH, conductivity, nitrites, sulphates, etc. Hydrobionts test. Prof. Craig Williams and Dr. Brian Shiplee.

The Glenderamackin River



12:30 – 13:30 Lunch break in Newton RIGG College

13:30 – 17:00 Cameral processing of field work results in the University's laboratory. Results are given in Table 1.

Cameral processing of field work results in University's laboratory



Table 1 – The main parameters of the Glenderamackin River and its tributary

	Lower	Mid	Upper (above tributary)	Tributary
Stream width, m	11.1/7.0	6.0	9.5	3.5/5.6
Av. depth, m	0.14	0.62	0.15	0.122
Substrate type	Cobble/boulder	Gravel/sand	Cobble/pebble	Cobble/boulder
D.O., mg/l	92.7%/97.4%	98.2%	97%	97.6%
t°C	11.7	11.7	13.4	13.4
pH	7.4/7.1			
Cond. MS/cm	43.4	40.9	40.4	70.8
Discharge	0.75 m ³ /s			0.09 m ³ /s

WEDNESDAY 5th July 2017

10:00 – 12:00 Trip to St. Bees, a village in the Copeland district of Cumbria on the Irish Sea coast, the most westerly point of Northern England.



12:00 – 13:30 Shore Ecology at St. Bees. Field research on the ways in which organisms are adapted to the environmental conditions they are subjected to and the ecological niche they occupy in the ecosystem. Prof. Craig Williams, Dr. Brian Shiplee.

13:30 – 14:30 Lunch Break

14:30 – 16:00 Sea Watch at St. Bees. Main water parameters definition, including temperature, pH, conductivity, nitrites etc. Prof. Craig Williams

16:00 – 18:00 Move from the Sea to Newton RIGG College

THURSDAY 6th July 2017

10:00 – 12:00 Methodology for waterbody and watercourse assessment. Establishing indicators for water quality. Site visit to Lake District: Lancashire streams. Prof. Craig Williams and Dr. Brian Shiplee.

12:00 – 14:30 Trip to the streams flowing down the mountains. Waterbody assessment: measuring temperature, pH, calcium content, conductivity, O₂.

14:30 – 15:30 Lunch Break

15:30 – 17:00 Establishing indicators for water quality in Upper Duddon river. The investigation of Hardnott and Gaitscale Gill catchment. Prof. Craig Williams and Dr. Brian Shiplee.

17:00 Return to Newton RIGG College

Table 2 – The basic parameters for the Lancashire streams flowing down the mountains

Name	Temperature (°C)	DO (%)	Conductivity (µS)	Calcium concentration (mg/l)	pH value
Side №1 Three Country stones, very small stream	16.6	53.5	22.8	9	6.5
Side №2 (stream in 300 m below)	13.8	98.8	17.7	0	6.8
Side №3 (500 m below)	11.1	98.6	31.2	0	7.2
Side №4 (before confluence of 2 streams)	15.7	100.6	19.0	0	6.9
Side №5 (confluence of 2 streams)	14	97.9	14.7	0	6.43
Side №6 (after confluence of 2 streams, 50 m below)	15.9	100.6	18.8	0	6.76
Side №7 (300 m below streams)	16.2	100.8	18.4	0	6.8
Side №8 (before bridge)	15.9	100.6	18.8	0	6.78
Side №9 (after bridge)	15.8	99.8	15.2	0	6.5

Table 3 – The basic parameters for the lakes in the Lake District area

Name	Temperature (°C)	DO (%)	pH	Conductivity (µS)	N (mg/l)	P (mg/l)	Ammonia (mg/l)
Ullswater	15.5	109.7	8.5	41.0	2.20	0.27	0.17
Harrop Tarn	14.5	95	6.5	15.2	2.3	0.14	0.15
Thirlmere	15.9	114	7.5	24.6	4.3	1.25	0.05

Field research on the Lancashire streams



Lancashire streams. Waterbody assessment



FRIDAY 7th July 2017

09:00 – 12:30 Final day in Newton RIGG College, Penrith. Evaluation of the results: management of rivers, safety assessment, environmental issues discussion. Conclusions and further planning.

12:30 – 13:30 Lunch break

14:00 – 17:00 Move from Penrith to Wolverhampton

SATURDAY 8th July 2017

Departure day