Course Outline

Following the recent enactment in Europe of the Water Framework Directive, the Landfill Directive and the Groundwater Regulations, and the international imperatives of the Millennium Development Goals, there is a high demand for trained, experienced scientists and engineers with specialist knowledge of river basin management and an understanding of the broader principles of integrated water resources planning.

The WRA course in River Basin Management is designed to give practicing professionals the required knowledge and exposure to a range of skills used in the sustainable and integrated management of the water resources in a large drainage basin.

Course Content

The course will be taught through four main modules, tackling the key components of river basin management, and integrated water resources planning.

Management Framework and Institutions
- Basic principles of River Basin Management
- Environmental economics
- Water Resources policy and institutional framework
- Water Resource systems and assessment
- GIS applications for river basin management
- Water Framework Directive in Europe

Hydrological Science
- Catchment Scale and the River Basin Management Plan (RBMP)
- Water Quality, River and Aquifer Conservation
- Diffuse and Point pollution
- Impact of land management on water quality
- Biodiversity and ecology at river basin scale
- Renewable energy focusing on hydro-power and windfarms
- Climate change and hydrological modelling
- Remote sensing tools

Monitoring
- River Basin Processes
- Natural River Systems and restoration
- Field techniques and Monitoring requirements of RBMPs

Case Studies

The course will draw on the wealth of WRA experience and project examples, to exemplify key aspects of river basin management, and case studies will be used in hands-on work.

Course lecturers are regularly involved in teaching and research activities at the Universities of Oxford, Reading, and Newcastle-upon-Tyne and University College London.

Courses can be tailored to the specific requirements of clients, and delivered as a closed course at any location.

WRA Software

- **HYSIM**: Hydrological catchment model with database engine for resource assessment and flow naturalisation.
- **AQUATOR**: Conjunctive use water resource system model.
- **HYDRO**: Multi-purpose reservoir operation and analysis.
- **CDIG**: Digitising software for hydrological data.
- **LASER**: Liming control model.
- **HERMES**: River water quality model.
- **INCA-N**: Integrated catchment model for water quality (nitrites)
- **INCA-P**: Integrated catchment model for water quality (nutrients, sediment, macrophyte dynamics)
- **DISPRIN**: General purpose program for simulation of water quality dispersion along river systems.
- **PTFIT**: Interpretation and analysis of pumping test data.
- **WDT**: Well design toolkit for Water wells

Training

- **Project design**: Designing projects with logical frameworks and team-up tools.
- **Well analysis**: Provision and use of software for simulation and analysis of pumping, and observation well behaviour, including analytical prediction of well losses.
- **Rainfall/runoff modelling**: Use of rainfall/runoff models for a variety of applications.
- **Water quality modelling**: Use of river, catchment and lake models.
- **River Basin Management**: Use of river, catchment and lake models.

To Find Out More

For more information please visit our web site at: [http://www.watres.com](http://www.watres.com)

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Water Resource Associates Ltd was founded in 1994 and provides specialist consultancy services, world-wide. The Directors have previously worked for a range of organisations including the Institute of Hydrology, British Geological Survey, firms of consulting engineers, the British water industry and International agencies. They have experience of working on problems in the water environment in over 120 countries across the full spectrum of arid to humid climates.

Canada: Lake Simcoe Nutrient Modelling [Trent University and Ontario Ministry of the Environment].
Norway: SEALINK project, examining changes in nutrient fluxes to the sea from air and land sources in the Vansjø-Hobel Basin.
Scotland & Northern Ireland: HYSIM-AQUATOR software for surface water yield assessment [SNIFER]
British Waterways: Development of hydrological models for reservoir and canal feeders throughout England and Scotland.
Belgium: Flood Study of Meuse tributary [Namur City Council].
Romania: Modelling metals in the Aries and Mures Rivers [Rosia Montana Gold Corporation]
Turkey: Yeşilirmak River Basin assessment of impact of climate change on irrigation and hydropower [Soventa].
Azerbaijan: Surface Water Studies for Sangachal terminal and Senoia hazardous waste facility [BP Exploration Shah Deniz] Russia: Reservoir optimisation for Volga navigation study at Nizhny Novgorod [SKW for ROSRECHFLOT]
Middle East Peace Process: Development of national water data banks & Environmental early warning system [EU and GEF]
Jordan: Modelling ancient and modern hydrology for the Water, Life and Civilisation project [Leverhulme Trust]
Lebanon: Water Resource study of the Hasbani Basin to assess equitable use of the Jordan River resources [EU-Relex].
Yemen: Sayhut and Nourj Dam feasibility Studies [Conser, Abu Dhabi Fund for Development]
Botswana, Namibia: Effects of proposed pumped abstractions on Okavango Delta [Ministry of Water, CSIR, South Africa]
Malawi: Environmental and Natural Resources Management Action Plan for Upper Shire Basin [LTS-MCC]
Lake Victoria Basin Commission: Control rules for hydro-power operation and management of lake water level [with CEH]
Tanzania: Dar-es-Salaam future water supply [Norconsult]
Mozambique: Hydropower part of Energy Master Plan
Nepal: Upper Tama Koshi hydropower feasibility study
Brunei: Temburong Transfer Scheme & Batu Apoi Dam feasibility study [Montgomery Watson, for Min of Public Wks]
Indonesia: South Java flood control study [Min of Public Works; Bintan Industrial Estate Water Supply [Sembcorp Parks]