International Training Course on Hydrological Droughts and Low Flows
26-30 September 2005
Regional Humid Tropics Hydrology and Water Resources Centre (HTC)
Kuala Lumpur, Malaysia

Background
There are increasing pressures on water resources as a result of population growth, economic development and the adverse effects of land use and climate change. The impact on freshwater systems is most severe during periods of low groundwater and low streamflow, resulting in significant and widespread economic and environmental damage during extreme droughts. In vulnerable regions there are direct impacts on human health. In order to design and manage water resource schemes, it is essential to estimate the spatial and temporal variability of droughts in order to mitigate impact on surface and groundwater resources. This requires an understanding of data requirements, hydrological processes, frequency analysis, time series, analysis, simulation modelling, including estimation of the ungauged site. It is important that these analytical techniques meet the needs of operational agencies and can be used easily by them.

Main Topics
The objective of the training course is to teach and discuss techniques and tools for the analysis of surface water and groundwater droughts (droughts and low flows). The course themes are:

- Hydro-climatology and drought-sensitive regions around the world
- Introduction to drought definitions
- Drought-generating hydrological processes
- Frequency analyses and extreme value analyses
- Regionalisation and estimation at the ungauged site
- Physically-based modelling and assessment of human impacts
- Aquatic ecology
- Case studies and operational practice
- Application exercises with own data.

Application and Admission
This training course aims at professionals working in the field of water management and governmental administration, e.g. staff of water resources management authorities, at universities and research institutions, or consultants working in this field. Participants are expected to have finished a relevant BSc programme, because the course is at MSc level.

Since the training course is given in English, a good knowledge of this language is a prerequisite for admission.

Applicants are requested to send an application (not more than one page) to the IHP/HWRP Secretariat, Koblenz, before 15 March, 2005. It should be accompanied by a letter from the director of the institute at which they are employed confirming that they are working in this field and endorsing their participation in this workshop. Endorsement from both the National Commission for UNESCO and the IHP National Committee from the applicants country are also requested.

Participants are encouraged to contribute with their own research, case studies and also data sets for exercises.

Fellowships
Candidates are advised to check first with their employer or with their own government to determine if funding for their participation in this workshop can be provided from local or other sources. Candidates from developing countries professionally involved in development projects funded by foreign or multilateral aid are advised to inquire with the executing agency as to whether their participation can be funded from a training component of the project budget.
The organising committee has only a limited number of fellowships at its disposal.

**Venue of the workshop and accommodation**

The training workshop will take place at the Regional Humid Tropics Hydrology and Water Resources Centre (HTC), Kuala Lumpur, Malaysia.

Rooms will be reserved by the HTC on request.

**Organising Institutions**

The study course is convened and sponsored by the National Committee of the Federal Republic of Germany for the International Hydrological Programme (IHP) of UNESCO and for the Hydrology and Water Resources Programme (HWRP) of WMO and co-sponsored by:

- UNESCO Jakarta, Regional Science Bureau for Asia and the Pacific
- WMO
- Regional Humid Tropics Hydrology and Water Resources Centre (HTC), Kuala Lumpur, Malaysia

**Organising Background**

The workshop falls within the education and dissemination programme of the Northern European FRIEND Low Flow group.

The workshop is a contribution to IHP-VI, Theme 5 Water education and training, Focal area 5.4 Institutional development and networking and to the Programme on Capacity Building in Hydrology and Water Resources of the HWRP, and FRIEND phase 2.

**Lecturers**

The lecturers are international experts from Norway, United Kingdom, The Netherlands, Malaysia and Germany who have worked in the field of low flows, groundwater and droughts for the last two decades.

**Registration**

Giuseppe Arduino
Regional Hydrologist
UNESCO House
Jalan Galuh (II), No. 5
Kebayoran Baru
P.O. Box 1273/JKT
Jakarta Selatan 12110, Indonesia

Tel. : + 62 21 739 9818
Fax : + 62 21 7279 6489
E-mail : g.arduino@unesco.org