




Assessing groundwater resources under the pressure of climate change


The GRAPHIC Project

Groundwater Resources Assessment under the Pressure of Humanity and Climate Change



Overview

1. UNESCO IHP
2. IHP VII
3. GRAPHIC






United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme of UNESCO

UNESCO's International Hydrological Programme (IHP)

- The only intergovernmental programme of the UN system devoted to:
 - water research, water resources management, and education and capacity building.
 - the scientific study of the hydrological cycle and to formulating strategies and policies for the sustainable management of water resources.





United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme of UNESCO

UNESCO's International Hydrological Programme (IHP)

- IHP was conceived as an evolving programme, ready to adapt to societies' needs and transformations.
- Consultation mechanism
- Implemented in ***six-year phases***, in order to
 - promptly identify emerging problems,
 - alert decision makers, raise public awareness,
 - provide the resources to respond with appropriate actions.








UNESCO IHP-VII

“Water Dependencies – Systems under Stress and Societal Responses”

- Managing and protecting our planet’s water resources are prerequisite of sustainable development.
- High priority given to the IHP as a prominent vehicle for meeting the UN Millennium Development Goals







UNESCO IHP-VII

5 Themes

addressing the overall topic of *Water Dependencies* from a wide range of perspectives:



- 1. Adapting to the Impacts of Global Changes on River Basins and Aquifer Systems**
- 2. Strengthening Water Governance for Sustainability**
- 3. Ecohydrology for Sustainability**
- 4. Water and Life-Support Systems**
- 5. Water Education for Sustainable Development**











GRAPHIC – what's it all about?

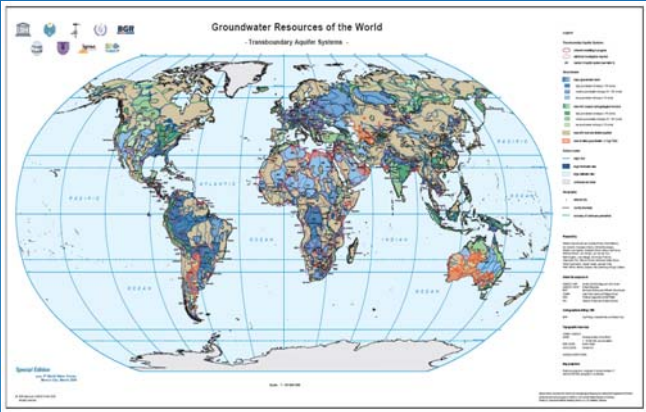
*Humans are **changing** the global water system in a globally-significant way **without** adequate knowledge of the system and thus its **response to change***










GRAPHIC – what's it all about?



More than **1.5 billion** people worldwide rely on **groundwater** for their primary source of **drinking water**.



GRAPHIC – what's it all about?

Groundwater is an extremely important natural resource as a primary source for domestic, agriculture, and industry in many countries.

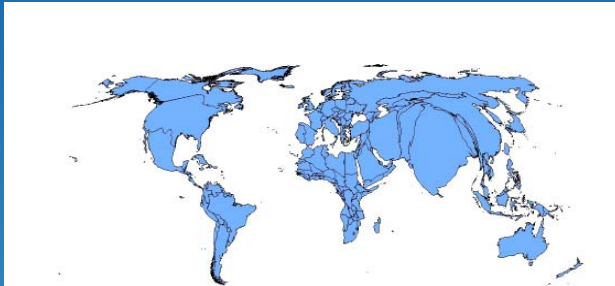






Figure 2 – Base: **GROUNDWATER DEPENDENCY**
 J.Margat, UNESCO-BRGM 2008

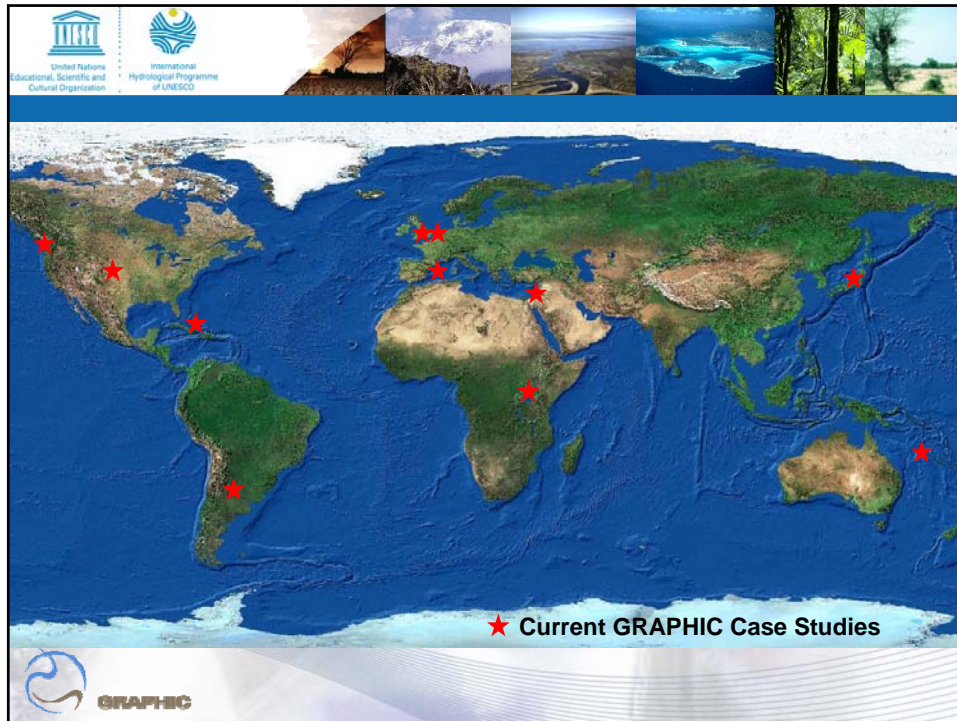


GRAPHIC How does it work?

- establish an international network for groundwater resources monitoring
- network of case studies in different regions/countries analyzing groundwater sustainability, identifying adaptation measures
- database of findings to compare data among areas, evaluating how factors influence local water quality and quantity





United Nations Educational, Scientific and Cultural Organization
International Hydrological Programme of UNESCO


GRAPHIC international group of experts and partnerships

Established partnerships with:
Geological Surveys (TNO, BRGM, USGS, BGR), USDA, NASA, RIHN, IGRAC, IAH, Universities in Canada, The Netherlands, UK, Brazil, Argentina, Spain, Italy, ...), WWAP, UNU-EHS, and others

Linkages with other UNESCO-IHP projects and programmes (ISARM, GWES, G-WADI and others)



GRAPHIC

A blue text slide with a white border. The top of the slide features a row of six small images: a classical building, a globe, a mountain range, a landscape with a winding road, a blue lagoon, and a forest. The bottom left corner has the GRAPHIC logo, which consists of a stylized blue wave and the word 'GRAPHIC' in black capital letters.



IHP-VII and GRAPHIC


GRAPHIC contributes to
THEME 1 of IHP-VII: *Adapting to impacts of global changes on river basins and aquifer systems*



IHP-VII and GRAPHIC

Activities under GRAPHIC will contribute to:

- **Assess the impacts** of global change on groundwater resources and support Member States in addressing regional needs through global coordination;
- **Improve understanding of how groundwater contributes to the global water cycle** and evaluate the changes to groundwater storage and flux;
- **Facilitate groundwater assessments** and exchange of information via seminars, workshops and conferences;
- **Better define growing population pressures** on groundwater resources, global warming impacts on groundwater recharge rates, rising sea levels and saltwater intrusion;
- **Raise awareness** of decision makers, implementers, users and the general public of the importance of groundwater as a store of freshwater to encourage improved protection and sustainable use.





Our Message

Improve collaboration between climate and groundwater scientists in the development of adaptive strategies to climate impacts

- Recognise the importance of **improved consideration** of groundwater in climate adaptation and science
- More research in the field of climate impacts on groundwater
- **Promote inclusion** of groundwater in climate models
- Include groundwater in the land-surface models to improve prediction

