European Water Policy: challenges for Hydrogeologists

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Why this workshop?

- Publication of the EU Commission’s Blueprint to Safeguard Europe’s Water Resources policy document introduces a new strategy to reinforce water management within the EU: tackle the obstacles!
- Groundwater evaluation requires high professional standards and hydrogeologists can offer their ability on this topic
- Policy based on WFD and GWD, but also on other linked Directives, needs to be integrated and applied in a modern perspective, based on sound technical and scientific principles and information
- “Classical” hydrogeological approach must be updated, adopting multidisciplinary methods to meet complex economical, social, environmental and policy questions
- In this framework, communicating the role and the mission of hydrogeologists to the general public, governments and stakeholders is a difficult but necessary task
## EFG Panel of Experts on Hydrogeology

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
<th>Company/organisation</th>
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<tr>
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<td>Portugal</td>
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<td>Serbia</td>
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<td>Peter Malik</td>
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<td>Carlos Martínez</td>
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<tr>
<td>Clive Carpenter</td>
<td>U.K.</td>
<td>GWP Consultants</td>
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Contribution of EFG PE on Hydrogeology

✓ Participation to the CIS WG-C Groundwater
✓ Periodical e-meetings to discuss news and actions for professional hydrogeologists
✓ Special issue of the EFG European Geologists Magazine, May 2013
✓ Organization of this workshop
The “hidden” resource

✓ Groundwater vs. Surface water
    or Groundwater & Surface water?
✓ River Basin Management Plans fundamental for analysis, planning and measures
✓ difficult identification and characterization of groundwater bodies (storage, renewal rates, ecological status, 3D approach)
✓ baseflow of surface waters is guaranteed by groundwater: the only flow on dry seasons
✓ groundwater study requires professional skills
The classic role of hydrogeology

✓ groundwater quantity and quality evaluation
✓ renewable resources evaluation
✓ interdisciplinary approach (geosciences)
✓ field monitoring
✓ integrated water resources management
✓ simulation by mathematical models
✓ surface/groundwater interaction
✓ background and basic knowledge to be continuously implemented
Groundwater studies: a conceptual model

- Groundwater Management
- Conceptual Model Refinement
- Policy, Regulatory Actions and Decisions
- Communication and Result Transfer
- Result Evaluation
- Data Check and Analysis
- Field Surveys and Measurements
- Monitoring Network and Strategy
- Available Data and References
Towards a modern approach

- over-abstractions, climate changes and strategic resources
- non-point and point source pollutants: prevention measures and remediation activities
- integrated uses and re-use of water (energy)
- vulnerability as a planning tool (from investigation to decisions)
- e-flows to be accounted for (GDE: groundwater dependent ecosystems)
- multiscale approach
- multidisciplinary approach (not only engineering and economic, but chemical, biological, ecological contributions)
Hydrogeological tools to be adopted

✔ quantity and quality monitoring: sampling standard procedures and network strategy (multilevel sampling for vertical heterogeneity)

✔ mathematical models: simulation and prevision of impact of human activity, but also a management tool

✔ validation of the conceptual model by independent data (as geochemical, geophysical, etc): confidence to be evaluated
New challenges: the policy point of view

✓ **Blueprint: tackle the obstacles!**
✓ addressing water pollution: occurrence and fate
✓ increasing water efficiency and resilience
✓ improving governance of water resources management
✓ natural water retention measures
✓ evaluation of ecological flow
✓ reduction of over-abstraction
✓ monitoring of pollutants
✓ water accounts at basin scale
✓ drinking water protection zones in RBMPs
✓ standard methodology and procedures
✓ ensure high and equal level of protection
✓ comparability of the assessment of GW chemical status
✓ trend and trend reversal assessment
✓ base decision-making on sufficient, correct, robust and transparent information, correct interpretation and comparability of reported results
New challenges: the technical point of view

✔ drought occurrences/land use planning
✔ climate change and induced impacts
✔ solutions for socially unstable conditions/locations (NYMB problem)
✔ contribution for developing countries
✔ economical and social evaluations (risk-based approach and/or vulnerability approach)
✔ energy from water
✔ emerging contaminants
✔ ecological flows: role of groundwater
✔ standard methodology and procedures
✔ quality standards, threshold values and natural background levels
✔ multilevel monitoring and investigations (point and non point source of pollution)
✔ **EFG can provide professional training**
Looking for sustainability

- Environmental Protection
- Human Requirements
- Renewable Water Resources
Interaction of different subjects

- Policy Makers (EU, Member States)
- Research and Innovation
- Professional Hydrogeologists
- Stakeholders and Public
- Public Authorities
## Perspectives and further steps

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<th>Problems/Requirements for policy actions</th>
<th>Contributions/Solutions from hydrogeologists</th>
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<td>SW/GW interaction monitoring</td>
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<td>Chemical status</td>
<td>Role of point-source and emerging contaminants</td>
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<td>Characterization of GW bodies</td>
<td>Multilevel monitoring</td>
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<td>Monitoring strategy and network</td>
<td>Upscaling and downscaling approach</td>
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<td>High and equal level of protection</td>
<td>Vulnerability preliminary evaluation</td>
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<td>Impact of human actions/climate change</td>
<td>Mathematical and conceptual models</td>
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<td>Trends and natural background</td>
<td>Water-rock interaction, water ages</td>
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*To be continued ....*