ASSESSMENT OF GROUNDWATER INDICATORS FOR SIDS AQUIFER SYSTEMS

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• Main Objective
• Island Groundwater Systems
• The Assessment Framework
• Scope of Work
• The Research Team / Expertise
• Synergies with Other Projects
Main Objectives of the Groundwater Component of TWAP / SIDS

• Provide a description of the present conditions of aquifers in Small Island Developing States (SIDS) that will enable prioritization of SIDS for resources allocation; and

• Bring to the global attention the major issues, concerns and hotspots of these SIDS aquifers, and catalyze action.
Why are Groundwater Systems of Islands Unique?
Island Groundwater Systems
Threats to GW on Islands
The Assessment Framework
Assessment of Groundwater

Current State ➔ Projected Stress
• Targeted indicators have been defined for the TWAP / SIDS Groundwater assessment
  • Current State Indicators
  • Projected Stress Indicators
• Indicators will be informed (derived from) variables related to the key components of the DPSIR Framework
  • Drivers, Pressures, State, Impact, Responses
The SIDS are situated within three regions: AIMS (Africa, Indian Ocean, Mediterranean and South China Sea) Region; Caribbean; and Pacific (43 in total).
Because 30 of the 43 SIDS are comprised of more than one island, it is not practical to collect information on an individual island basis.

- Rather the strategy for this assessment will be to select one island (or perhaps two if the geomorphology and geology are significantly different) within each SIDS, as representative of the SIDS.

For SIDS, there are two possible aquifer systems

- The entire island comprises an aquifer system
- A dominant aquifer can be identified
- Consideration will be given to both options with the 1st option as the default case
Climate data for islands can be difficult to obtain because there are no nearby stations that can be used.
If there is any topography (as there often is), the climate data from low elevation may not be representative of higher elevation

- Island climate dataset available (UEA website) as a baseline gridded dataset
- Compared to local climate data when possible

Propose to use a water balance model using representative climate data to estimate AET, Recharge, Soil Moisture

- Recharge results compared with TBA assessment where in proximity
1. Conduct a preliminary assessment of variables.
   - Select a “representative” island(s) for each SIDS
   - Compile data and information from existing public sources.
   - Employ a consistent methodology for assessing all the SIDS as a group.

2. Develop a questionnaire for distribution to regional expert networks and knowledgeable experts within each SIDS.

3. Integrate the results of the questionnaire with the preliminary assessment of variables to define the Current State Indicators and Projected Stress Indicators.

4. Assess interlinkages among water systems

5. Generate hydrogeological cross sections and SIDS profiles

6. Complete a final report with supporting documentation (GIS database)
• Diana Allen (Simon Fraser University (SFU), Canada) – project lead
• Jason Gurdak (San Francisco State University, USA)
• Makoto Taniguchi (Research Institute for Humanity and Nature, Japan)

The research team members have been part of the UNESCO GRAPHIC expert group since its inception. All are hydrogeologists and hold positions at a university/institute.
Throughout the project, data will be stored in a centralized system (ArcGIS / MS Access project files) that can be readily transferred to UNESCO at the end of the project.
The Bahamas GRAPHIC Case Study – Risk Framework for islands (partnering with The Nature Conservancy)
- Response time for tide surge, sea level rise and saltwater intrusion

Natural Resources Canada
- Risk to Groundwater in Bedrock Aquifers

Research Institute for Humanity and Nature Pacific Rim Project

Synergies with Other Projects