IAH network on “Coastal aquifer dynamics and coastal zone management”

QUESTIONNAIRE

IAH national committees, IAH members and non members from all around the world involved in SWI and SGD research and management are kindly asked to fill in the questionnaire in this page with as many details as possible.
A world database will be set up and made available, with basic coastal aquifer main characteristics.
We expect to gather standard and comparable information on the knowledge level and hopefully the state of the art of the research on SWI and SGD, and coastal aquifer management methods adopted around the world

1)	Location of aquifer (country, more specific location):	La Aldea coastal aquifer (Gran Canaria, Canary Islands)
2)	Reported by:	T. Cruz, M. C. Cabrera and J. Heredia
3)	Type of medium (karst, porous, fracture)	Volcano-sedimentary aquifer, porous and altered
4)	Type of aquifer (phreatic or confined)	The aquifer is hydrogeologically unconfined and consists of two closely related main units: the upper sedimentary unit and the lower volcanic unit
5)	Main lithology - (e.g. gravel, sand and clay)	Sedimentary unit consisting of alluvial and screes deposits (consisting of detritical material with phonolites-trachytes, ignimbrites and basalts boulders) and the volcanic unit, consisting of Miocene basalts
6)	Hydrochemistry: fresh or saline	Fresh and saline. High salinity waters are located near of Las Tabladas area
7)	Saltwater intrusion: lateral from sea or lakes - upconing	Seawater intrusion is not significant
8)	Aquifer geometry: hydraulic characteristics	The valley has a flat bottom surrounded by high mountains on the north,south and east sides and it is located in arid and semi-arid area. The sedimentary deposits are more permeable than the basalts, both constitute a single aquifer split into two hydraulically connected sub-layers. Groundwater in the different materials (basalts, scree deposits and Las Tabladas unit) flows towards the alluvial deposits
9)	Aquifer parameters: storage - annual water pumping - (in MCMA - millions cubic meters, annually)	Aquifer recharge is mainly the result of irrigation return flows and secondarily that of rainfall infiltration.The artificial outflow is the withdrawal from the aquifer through more than 370 large-diameter wells (2.5 to 3 m) located mainly in the alluvial deposits. The main alluvial aquifer behaves an intensively developed small aquifer with a short turnover time, which plays an important role in guaranteeing local water supply for irrigation.Rounded up average recharge values are 2 hm3/year for irrigation return flows and 1 hm3/year for rainfall recharge (13% of the average precipitation). 77% of outflow (3 hm3/year) is groundwater abstraction by pumping wells for irrigation and the remaining 23% (1 hm3/year) is discharge into the sea
10)	Depth of aquifer (water level and bottom) - water level 5-30 m - aquifer depth - 50-200 m	Two main factors determine groundwater level evolution: decreased irrigation return flows as crop area diminishes, and the increased aquifer exploitation due to the decreased surface water supply from the dams.The bottom of the aquifer is the contact between the less altered basalts and the unaltered basalts at 163 m depth
11)	Major chemistry (anions - ?; Cations - ?):	Groundwater ranges from Na-Cl-HCO_3 type for moderate salinity water to Na-Mg-Cl-SO4 type for high salinity water
12)	Major salinity sources:	Seawater,saline waters located in the Las Tabladas area,sodium and magnesium input and dissolution of minerals
13)	Population:	With over 8,000 inhabitants, La Aldea is one of the most intensive and productive cash-crop agricultural areas on the island
14)	Aquifer status: special features - e.g. thermal springs, major faults,…	
15)	Investigation methods - e.g. water level measurements, EC (electrical conductivity profiles), TDEM (geophysical),	Major physical and chemical components. Graphical, multivariate statistical and modelling tools
16)	Numerical hydrological modeling, chemical and isotopic methods, age determination, IR survey, seepage meters (for Submarine Groundwater Discharge, SGD)	The chloride steady-state transport model has been a useful complementary tool to check and refine the hydrochemical conceptual model of the study area to explain groundwater salinity and chemical processes
17)	Monitoring methods applied and duration - water level measurements, EC (electrical conductivity profiles - seasonal)	Specific data from field campaigns carried out in 1992 and 1999. Several groundwater monitoring networks have been operating in the area since 1995, comprising 7–39 wells. The more recent network was active from August 2005 to September 2006 and included 11 quarterly surveyed wells
18)	Management methods:	Current use of La Aldea aquifer may be in conflict with the good groundwater quantitative and chemical status demanded by the European WFD principles and regulations. Attaining good aquifer quantity and quality status is not compatible with local socio-economy,and implies a high cost. Should present use continue, special considerations through agreed specific legal exceptions could be needed under adequate regulations.The impact on littoral marine resources seems small to negligible. Enforcing tlating infrastructure and disproportionate costs due to the special characteristics aquifer system and its behaviour within the local water resources system
19)	Aquifer management actions:	The efficiency use of nitrate in crops could be improved and the pollution due to fertilizer application could be decreased. A validated conceptual model and the related numerical model are useful tools in the attainment of WFD goals and also for water- management purposes. Models are not static tools and they have to be periodically updated based on data from monitoring networks
20)	Identification of existing or potential problems:	The intensive agriculture has an important impact on the aquifer,degrading groundwater quality and, during droughts, causing the drawdown of groundwater levels
21)	Annexes:	
22)	Observations:	