IAPSO Commission on Groundwater-Seawater Interaction
Report 2004

By the end of 2004 there were 138 members of CGSI from 44 countries (see appendices updated 1.1.2005, with new membership numbers (147) and country participation (48)).

One of the most important activities of CGSI in 2004 was organisation of the Groundwater-Seawater Interaction (GSI) Workshop and a Business Meeting of CGSI in Monte Carlo, Monaco. The meeting and workshop took place during the IAEA International Conference on Isotopes in Environmental Studies Aquatic Forum 2004 (October 24-29, 2004), co-sponsored by IAEA, EML-IAEA, IOC-IHP/UNESCO, and CIESM. The Government of the Principality of Monaco under the patronage of HRH Prince Rainier, hosted the Conference. Scientific Secretary of the Conference P.P. Povinec.

Information of the IAEA Workshop on Groundwater-Seawater Interactions (GSI Workshop) and the list of presentations (Chairpersons W. Burnett and H. Bokuniewicz (USA), E. Kontar (Russian Federation), G.M. Zuppi (Italy) and J. de Oliveira (Brazil):

P.K. Aggarwal, K.M. Kulkarni, P.P. Povinec, L-F. Han, M. Groening (IAEA), Environmental Isotope Investigation of Submarine Groundwater Discharge in Sicily, Italy.

A. Aurely, A.M.G. Privitera (Italy), Salt Water Intrusion in the Aquifer in the South Oriental Coastal Zones of Sicily.

A. Aurely, G. Barrocu, G. Cusimano, D. Fidelibus, G.M. Zuppi, et al. (Italy), Hydrochemistry and Isotopic Characteristics of the Submarine Springs of South-Eastern Sicily.


E. Garcia-Solsona, P. Masque (Spain), J. Papalia, H. Bokuniewicz (USA), L. Zaggia (Italy), et al., Radium Isotopic Tracers of Submarine Groundwater Discharge into the Venice Lagoon.

Y. Weinstein, B. Herut, G. Lessa (Israel), W. Burnett (USA), et al. Submarine Groundwater Discharge (SGD) along the Mediterranean Coast of Israel.

W.C. Burnett, R. Peterson, H. Dulaiova (USA), Groundwater Inputs via Rn-222 and Ra Isotopes off Ubatuba, Brazil.

J. de Oliveira (Brazil), M. Charette, M. Allen (USA), V.V. Furtado (Brazil), Coastal water Exchange Rates at the Southeastern Brazilian Margin, using Natural Ra Isotopes as Tracers.

E. Kontar (Russian Federation), A. Salokhiddinov, N. Takhirov (Uzbekistan), Assessment of Groundwater-Seawater Interactions in the Aral Sea Basin and Pollution Control.


G. Kim, D.-W. Hwang, Y.-W. Lee, K.S. Park (Republic of Korea), Biogeochemical Consequences of Submarine Groundwater Discharge in the Coastal Ocean.

J.W. Ryu, G. Kim (Republic of Korea), Submarine Groundwater Discharge into the Yellow Sea.

P. Ollivier, C. Claude, O. Radakovitch, B. Hamelin (France), Radium Constraints on Groundwaters and Coastal Waters Dynamics in the Rhone Delta, France.
R.M. Qureshi, A. Mashiatullah (Pakistan), C.B. Gaye (Austria), M.A. Tasneem, T. Javed (Pakistan), Isotope Hydrochemical Investigation on Saline Intrusion in Coastal Aquifer of Karachi-Pakistan.

Those present at the CGSI business meeting:

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Apologies: Annette Kimmich

E. Kontar opened the meeting with a presentation on the background of the Commission and its recent development. Current situation:

The following objectives of CGSI were confirmed:

Knowledge development in fields of CGSI with particular attention to submerged coast and continental surface and groundwater outflow to sea, keeping in mind co-operation with people who are active in this area.

Project development as the simplest way of augmenting funds with the use of 3rd party support to cover internal expert expenses. The experts, following the aims of CGSI, would be encouraged to organise and submit projects for that purpose.

Training and education of young researchers (capacity building) for different parts of the world and especially developing countries, where there is a special need of knowledge for processes in coastal areas of high population density.

An overview of the plans of CGSI's activities for the end of 2004 and for 2005 was presented.

Members of CGSI were invited to contribute to the GSI session during the International Conference HAZARDS'2004 in Hyderabad, India (December 2-4, 2004), and to the session Marine Risks and Sustainability during the IAG/IAPSO/IABO (IUGG) Joint Assembly in Cairns, Australia (August 22-26, 2005).

Nowadays it is recognised that shelf zones and coastal zones are becoming major areas of industrial and technological development because of the growing human population in coastal regions and because of their store of natural resources such as fish, oil and gas. Therefore, understanding the risks of natural and human-made hazards in these areas assists to safeguard the populations in these regions and to strengthen the scientific and technological basis of a number of industries including oil and gas production and maritime transport.

Both sessions in Hyderabad and Cairns focus on evaluation of risks of saltwater intrusion, submarine earthquakes, landslides, tsunamis, contaminated submarine groundwater discharge and their influence on coastal oceanographic processes to produce a cohesive understanding of geo-risks and human-made hazards in coastal, shelf, and continental slope areas.

Papers are invited from the CGSI members on the scientific aspects of saltwater intrusion, contaminated submarine groundwater discharge and their influence on coastal oceanographic processes and other marine and human-made hazards in the coastal areas, as well as on their risk and sustainability aspects that deal with the interaction of the hazards with human populations, industries and infrastructure.

During the discussion W. Burnett remarked on the importance of using Internet and websites as a basis for the Commission and its activities. International projects already in progress - Sicily, Brazil, Philippines, Thailand, Mauritius. Results are promising. The APN project in the Philippines and Thailand, which includes SGD measurements and a training component have already been scheduled for January-February 2005.

M. Schubert followed with suggestions to foster links between CGSI and freshwater-related science and the mining industry (open pit mining). He suggested to extend the research focus of CGSI to groundwater-lakewater and groundwater-riverwater interaction with the final aim to investigate contamination pathways in such limnic systems (and to raise new fundings linked to such problems). He presented a co-operation offer for joint projects with a scientist group of hydrogeologists at the UFZ (Germany) experienced in isotope applications.

P. Masque suggested to consider the possibilities of joint projects with the European Environmental Commission.

J. de Oliveira presented the ideas on funding of participation of local scientists, members of CGSI, in the commission's activities. It was mentioned that this kind of activity is a good direction to follow, especially with the integration of developing countries and training of young scientists in mind.

It was agreed to invite the scientists who presented the papers during the IAEA GSI workshop in Monaco to join CGSI.

**Developing Country Activities**

One of the primary goals of the CGSI since its inception in 2001 was to initiate systematic studies and capacity building activities concerning how groundwater discharges influence the coastal zone in Southeast Asia. This area is of high scientific interest because of the high potential for groundwater discharge in the limestone-rich, high rainfall areas and because virtually no prior work has been performed there.

CGSI has emphasized activities with The Philippines and Thailand as the members of CGSI have developed good contacts with competent earth and marine scientists in these countries. During late July 2002, three commission members (Evgueni Kontar, Makoto Taniguchi, and William Burnett) traveled to The Philippines for one week to meet with our counterparts at the University of The Philippines, see the local facilities, visit potential field sites, and check on logistics. The following year, the same team met in Thailand where we performed some preliminary fieldwork with scientists from Chulalongkorn University. Approximately one half of the funds received from IUGG during 2002 and 2003 were spent to support scientists and students from developing countries to attend
these meetings and field studies.

The goal of these scientific visits was to collect sufficient information to prepare competitive research proposals. We are now starting to see the fruits of these labors. In 2003, we received a small ($30,000) grant from the Southeast Asia Regional Committee for START (SARCS) for a project entitled "Contribution of Carbon and Nutrient Species into SE Asian Waters via Submarine Groundwater Discharge." That project will support studies by Dr. Gullaya Wattayakorn (Chulalongkorn University) and her students (~26% of the funds will provide funding for scientists from developed countries to assist). Another proposal, to the Asia-Pacific Network (APN) has just approved ($50,660). That project, "Groundwater Discharge as an Important Land-Sea Pathway in the Southeast Asia," will support field studies in The Philippines by Dr. Fernando Siringan and his students (University of The Philippines) and a workshop in Thailand that will be attended by scientists from several other countries in the region as well as Thailand and The Philippines. Approximately 70% of the total APN budget will support scientists from developing countries. Finally, an ambitious proposal has been written in 2004 and is currently under review by WOTRO, the Dutch science agency that sponsors work in tropical countries. In addition to 150,000 Euros in research costs and 11,500 Euros in joint activities, the project would support 3 Ph.D. students, one from Holland and one each from Thailand and The Philippines. Approximately 50% of the research and joint activity costs would be allocated to scientists from developing countries.

Planning 2005

To contact CGSI members around the Indian Ocean with the intention of forming a task force to investigate problems resulting from the December tsunami, to aid mitigation planning in affected areas and to educate young scientists to form a basis for sustainable solutions.

To organise and conduct an assessment of changes in the coastal zone aquifers in Thailand affected by tsunami of 26 December 2004.

To organise and conduct an international research and training workshop in Thailand, the Philippines and Mauritius that closely matches the terms of reference of CGSI.

To organise and conduct the Symposium on Marine Risks and Sustainability during the IAG/IAPSO/IABO Joint Assembly in Cairns, Australia (August 22-26, 2005).

Appendix I:

as of 1.1.05: 147 members, 48 countries

Appendix II: