



ASSOCIATION OF GEOSCIENTISTS FOR
INTERNATIONAL DEVELOPMENT
(AGID)
GEOSCIENCE NEWSLETTER

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From Hon. Editor's Desk: Down the Memory Lane

The seeds of AGID's establishment were sown in 1972 during International Geological Congress (IGC) in Montreal, with Canadian International Development Agency (CIDA) assuming the role of financial sponsor. This was largely due to the efforts of two hard working Canadians, Prof. Roger Blais (later on honored as the Order of Canada) and Dr. Antony R. Berger. The initial Organizing Committee was led by Prof. Enilo Ajakaiye from Nigeria. My association with AGID started in 1975 when I became a member. In 1976, during the International Geological Congress (IGC) in Sydney, I was elected as a Member of AGID Council. Later on I also

became Vice-President (Asia). After serving two terms in AGID Council (1976-1980 & 1980- 1984) I retired from the Council in 1984.

In March 1986, during my visit to Bangkok, I met Dr Jon Rau who was then a member of AGID's Council and was working in the UN Economic and Social Commission for the Asia & Pacific. During lunch, Jon suggested that I should start a Newsletter of AGID for South Asia and offered a grant of \$500 per year for printing and mailing. This was the beginning of my long journey as an Editor of the "AGID South Asia and South-East Asia Newsletter" which later became AGID Asian Regional Newsletter and finally AGID Newsletter. This was because the other AGID newsletters for African and Latin American regions were very short-lived. Initially, I had started with 3 issues per year which were reduced to 2 issues per year. The Newsletter has given me chance to stay in touch with AGID members for the past 30 years or so.

Since last 43th IGC in Brisbane, it is being felt that due to growth of Internet and the increase in global communications as well as the free access to recent advances in geoscience, AGID may be closed as it has served its purpose of increasing communications, creating a sense of Geoscience fraternity and conducting training courses. After CIDA grant was stopped in 1996, financial difficulties made AGID to assume a low-key profile and its international activity was restricted to organizing sessions at the IGCs in Rio, Florence, Oslo, Brisbane and now at the upcoming IGC in Cape town. Formal closure of AGID may take place in Cape Town or in 2020 at the IGC in New Delhi. At Cape Town I will be completing my 40 years work in AGID's council.

Now about the current situation: For the past six months or so, I was engaged in communication with the Organizing Committee (O.C.) of the 35th IGC in Cape Town regarding AGID's sessions and also regarding Geohost grants . Due to the recent "global economic down-turn" especially in mining sector, the financial situation at the O C of this IGC in Cape Town is not as strong as that of the O C of previous 34th IGC in Brisbane (2012). In Brisbane, AGID was given full financial support, under Geohost program, for 13 participants selected by me, AGID President Ms. Afia and Dr. Mike Katz, AGID's local representative in Australia.

In the 35th IGC, the main problem was that Geohost program was limited only to participants from "low-income countries" as defined by the World Bank and not to participants from "developing countries" as in the earlier IGCs. This

excluded many of us from India, Pakistan, Indonesia, Nigeria, Sri Lanka etc. except Ms. Afia from Bangladesh. I therefore wrote to Prof. Jeannette McGill, Chief of the Geohost program, that unless some relaxation is made, AGID Theme Champions and Session Conveners would not be able to come to Cape Town and conduct the five sessions under AGID's Theme "Geosciences for benefitting low-income countries". After some exchange of e-mails Prof. Jeannette kindly agreed and asked me to send the detailed bio-data of the 8 persons who would take care of AGID sessions.

The results of Geohost grants are just declared with only 8% of the Applicants being successful in getting the grant. However, the 8 grants of Geohost for AGID are still under consideration as a special case and would be given depending upon the financial situation next month.

AGID's five sessions received a total of 52 Abstracts (36 Oral & 16 posters). Ms. Afia and myself decided to accept all of them. Ms. Afia, our president, received several requests from participants from Bangladesh, Burkina Faso, Burundi, Nigeria etc. for financial support from AGID. She had to reply that AGID is not in a position to offer financial support but she would send them "A Letter of Acceptance of Abstract" so that on the basis of the Letter, they could try to obtain funds from other sources.

We are now waiting for the result on the special request by AGID for 8 Geohost grants. Let us hope for the best.

Shrikant Daji LIMAYE

Past President & Hon. Editor of Newsletter

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ENVIRONMENT

Desalination Efficiency

With the decrease in amounts of fresh water available to the western US, there have been many different approaches suggested to combat the severe drought. One that is commonly heard is desalination. Desalination through distillation is highly inefficient due to the large heat capacity of water. Reverse osmosis does seem to pose a more efficient option.

Reverse osmosis (R/O) has become the standard for converting ocean water to fresh water. This is being widely used now by mining in Chile and Peru in coastal desert regions. Someday it will be more widely used in California including perhaps the construction of such plants by Nevada and Arizona in return for a larger share of the Colorado River water which California imports to high population areas along the coast. The cost of R/O is about \$1/m³ (assuming treatment to fresh water standards) which is certainly low enough for residential and commercial use, but not for agriculture. The major cost with R/O is energy (pressure to push the water through the membranes) and not replacement/maintenance of the membranes (largely due to technological advances) although the later requires skilled operators.

Shocking new way to get the salt out

MIT team has invented efficient shockwave-based process for desalination of water. As the availability of clean, potable water becomes an increasingly urgent issue in many parts of the world, researchers are searching for new ways to treat salty, brackish or contaminated water to make it usable. Now a team at MIT has come up with an innovative approach that, unlike most traditional desalination systems, does not separate ions or water molecules with filters, which can become clogged, or boiling, which consumes great amounts of energy.

Instead, the system uses an electrically driven shockwave within a stream of flowing water, which pushes salty water to one side of the flow and fresh water to the other, allowing easy separation of the two streams. The new approach is described in the journal *Environmental Science and Technology Letters*, in a paper by professor of chemical engineering and mathematics Martin Bazant and his Team. This approach is “a fundamentally new and different separation system,” Bazant says. And unlike most other approaches to desalination or water purification, he adds, this one performs a “membrane-less separation” of ions and particles.

In the new process, called shock electrodialysis, water flows through a porous material—in this case, made of tiny glass particles, called a frit—with membranes or electrodes sandwiching the porous material on each side. When an electric current flows through the system, the salty water divides into regions where the salt concentration is either depleted or enriched. When that current is increased to a certain point, it generates a shockwave between these two zones,

sharply dividing the streams and allowing the fresh and salty regions to be separated by a simple physical barrier at the center of the flow.

Water Controls Development of Mining and Power Projects

Concerns about rising carbon levels in the atmosphere, and competition from natural gas suppliers and renewable energy, dampen demand for coal. Global prices for coal, oil, and minerals have tumbled to near-record lows in constant dollars. Coal-fired power plants are being cancelled across Asia. The largest coal companies in the United States are in bankruptcy.

Almost \$US 400 billion in planned development in Canada's oil sands region, where water volumes in the Athabasca River are in doubt, have been cancelled. Droughts are wrecking grain harvests in Africa and Asia, and drastically reducing hydropower production in South America and Africa. Powerful local opposition campaigns are shutting down construction sites for new dams in Panama. Hard rock mineral mines are closing on five continents, many because of civic rebellions fueled by fears of disruptions to local water supplies.

Last year, in Alabama, the Drummond Company withdrew its plan to mine coal south of Birmingham along the Black Warrior River. The new mine, approved by the state, generated a decade of fierce public resistance because runoff and process water discharges would contaminate the river, the source of drinking water for 200,000 residents.

China this week announced it was cancelling or indefinitely delaying construction of 200 coal-fired power plants capable of generating 105,000 megawatts of electricity, or about a tenth of U.S. generating capacity. Carbon emissions, toxic air pollution, and constraints on the country's freshwater supplies, particularly in the dry northern Yellow River Basin, were among the reasons for the move.

Social conflicts in Peru, principally focused on disruptions to water supplies, have resulted in the indefinite suspension of \$US 21.5 billion worth of mining projects since 2010, according to the Peruvian Institute of Economics. In South Africa, the Medupi and Kusile coal-fired power plants are years overdue, tens of billions over budget, and may not have sufficient supplies of water to operate at full capacity if and when they are completed in the early 2020s.

Three years ago, Romania ended 14 years of public opposition and cancelled plans by Canada-based Gabriel Resources to build one of Europe's largest gold mines. Citizens fought the mine's plan to separate gold from ore with cyanide, a leaching process that has contaminated rivers and groundwater around the world. No wonder that a growing number of financial investment firms and Bankers now classify water security at the top of the list of financial risks to energy and mining related development Projects.

Web Enabled Ground Water Recharge Estimation Model

Website: <http://www.nih.ernet.in/WEGREM/WEGREM.html>

The Web Enabled-Groundwater Recharge Estimation Model, named as WEGREM brings all the groundwater recharge related information to groundwater professionals in a simple way. Groundwater in India is a critical resource. However, an increasing number of aquifers are reaching unsustainable levels of exploitation. WEGREM aims to take the data related to groundwater as input and generate results from processing and present them to the users so they may get benefit from it. The various levels at which such information will come into use can be:

- The common man can also have an overview of the groundwater recharge estimation model and can actually know what are the requirement and how it is calculated.
- Groundwater professionals can use it as a tool to analyse the situations and can take decision for the field improvements. It may also come in as an aid in resolving important issues related with groundwater management.

For any technical query or feedback regarding this module (developed by Ground Water Hydrology division, National Institute of Hydrology, Roorkee - 247667, Uttarakhand, India), you may contact Ms. SumanGurjar at sumangurjar@nih.ernet.in .

USGS Data Reveals Long-Term Changes in America's Groundwater Quality



(Hydro Resources Company drills a well near Sublette, Kansas, which overlies the Ogallala Aquifer, the nation's largest source of fresh groundwater.)

Chloride and nitrate concentrations are rising and arsenic levels are holding steady or falling. Those are two of the conclusions from a U.S. Geological Survey assessment of changes in the nation's groundwater quality in the last two decades. The federal science agency published the results on Thursday in an interactive online map.

The contaminants in the assessment comprise a roster of two dozen undesirable intruders that can cause health and environmental damage if not cleansed before consumption: cancer-causing chemicals, radioactive elements, and nutrients that foul the Great Lakes and Gulf of Mexico with algae.

More than 140 million people in the United States use groundwater as their primary source of drinking water. Of that group, some 45 million people use private wells, which are not subjected to the same legally enforceable quality standards as water utilities and therefore more vulnerable to contamination.

The groundwater quality map shows whether concentrations of pesticides, nutrients, heavy metals, gasoline additives, and other chemicals are rising or falling. For some contaminants, such as chloride and nitrate, there is a clear upward trend nationally. Other chemicals show regional trends. Uranium, for one, is rising in California's Central Valley and in the Southwest but not elsewhere. Still other chemicals, like toluene, a gasoline additive, show no detectable increase or decrease.

The study is part of the USGS's National Water Quality Assessment, whose purpose is to identify long-term changes in the quality of rivers and aquifers.

Big Copper Project in Canadian North

The mineralized boulders at surface, stained with rich turquoise hues, are impressive. But it's what could be sitting beneath the surface at Aston Bay Holdings' Storm copper project on Somerset Island, Nunavut in Canadian North that intrigues economic geologist Tom Ullrich.

"Nobody's had the opportunity to do any proper work in looking for the big prize on that property," says Ullrich, Aston Bay's Chief Operating Officer and Executive Vice-President. The "big prize" is a potential bounty of rich sediment-hosted copper mineralization hinted at by chalcocite leakage at surface, geophysical anomalies and limited historical drilling.

The \$94-billion mining giant BHP Billiton is interested and recently signed an option deal with Aston Bay Holdings for a 75% interest in the Storm project. The agreement requires exploration expenditures of \$40 million over 9 years, including a minimum of \$2.5 million in the first two years.

PUBLICATIONS

International Journal of Economic and Environmental Geology (IJEEG)

IJEEG (www.econ-environ-geol.org) an open access international journal **has been recently** upgraded to Y category by Higher Education Commission in Pakistan. Dr Viqar Husain (Vice-President, AGID) is the Chief Editor of the Journal. In order to strengthen the Journal further, the readers are invited to contribute research articles in the forthcoming issues.

The manuscript(s) may be submitted to the Chief Editor at segmite@gmail.com. Instructions for Authors (IFA) and previously published six volumes are available on journal's website www.econ-environ-geol.org.

COMING EVENTS

- **4 - 6 July**
ISPRS EORSA 2016. The Fourth International Workshop on Earth Observation and Remote Sensing Applications. Guangzhou, China
Website: <http://www.eorsa2016.org/>
- **10 - 13 July 2016**
9th International Conference on Environmental Catalysis. Newcastle, Australia
Website: <http://tinyurl.com/pts5mtv>
- **20 - 23 July 2016**
International Symposium - Challenges for Engineering Geology and Geotechnics after Natural Disasters. Sofia, Bulgaria
Contact: office@bondys.bg
- **22 - 26 July 2016**
International Symposium on Geodesy and Geodynamics. Tianjin, China
Website: <http://isgg2016.csp.escience.cn/>
- **25 - 27 July 2016**
5th International Conference on Earth Science and Climate Change. Bangkok, Thailand
Website: <http://www.ccop.or.th/activity/364>
- **20 - 21 August 2016**
6th International Conference on Environmental Pollution and Remediation. Budapest, Hungary.
Website: <http://icepr.org/>
- **21 - 25 August 2016**
33rd International Geographical Congress. Beijing, China,
Website: <http://www.igc2016.org/dct/page/1>
- **22 - 24 August 2016**
International Mine Management. Brisbane, Australia
Website: <http://www.immconference.ausimm.com.au/>
- **27 August - 4 September 2016**
35th International Geological Congress, Cape Town, South Africa
Website: <http://www.35igc.org/>
- **11- 15 September 2016**
2nd European Mineralogical Conference, Rimini, Italy
Website: <http://emc2016.socminpet.it/index.php>

- **19 - 24 September 2016**
European Geothermal Conference. Strasbourg, France
Website: <http://europeangeothermalcongress.eu/>
- **27 - 30 September 2016**
7th International Conference on Global Geoparks. Torquay, United Kingdom.
Website: <http://ggn2016.com/>
- **9 - 13 October 2016**
World Water Congress & Exhibition. Brisbane, Australia
Website: <http://www.iwa-network.org/event/world-water-congress-exhibition-2016/>
- **18 - 20 October 2016**
TeaGeo 2016 - International Conference & Exhibition on Advanced Geospatial Science & Technology. ISPRS. Tunis, Turkey .*Website:* <http://www.teangeo.org/En/>
- **7 - 11 November 2016**
International Mining and Resources Conference - IMARC 2016. Melbourne, Australia
Website: <https://events.ausimm.com.au/getdemo.ei?id=299&s= 1R80XVBLY>
- **14 - 16 November 2016**
5th International Conference on Geotechnical Engineering and Soil Mechanics. Tehran, Iran
Website: <http://www.igs.ir/>
- **16 - 18 November 2016**
Recent Advances in Rock Engineering - RARE 2016 - an ISRM Specialized Conference. Bangalore, India.
Contact <dto@nirm.in>

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