

Editorial

Based on its physical, chemical and ecological characteristics the Gulf is an offshoot of the mighty Indian Ocean. The region has its own distinct history. Over one thousand years ago the Gulf was part of an international trade network, the 'Spice Route', connecting the Middle East to Africa, India and China. Even earlier, the Gulf was an important route in antiquity during the days of Mesopotamian glory, when Mesopotamia was the linchpin of ancient international trade. Trade between Mesopotamia and India was facilitated by the small size of the Gulf (1000 km long and 200-300 km wide, surface area of 233,000 km²). East-West trade flourished and moved along the coasts of Persia (contemporary Iran) and India via Magan (contemporary Oman) and Dilmun (contemporary Bahrain), touching as far as the mouth of the Indus valley

During the Middle Ages, Muslim countries of the Middle East controlled East-West trade. However, in the fifteenth century, the Portuguese, assisted by their deep hulled ships, navigated round the southern tip of Africa penetrating into the Middle East, reaching as far as the Malabar coast of India. Domination by the Portuguese continued until the Safavid Shah of Iran invited the British and the Dutch to drive the Portuguese out of Iranian ports. The British succeeded and by the beginning of nineteenth century became the major power in the Gulf. In 1907, an international agreement among the major powers placed the Gulf under the British realm of influence. In the following year oil was discovered in the Gulf, attracting international attention by 1930. This attention has steadily increased ever since.

The modern strategic importance of the Gulf originated in the mid-19th century when British India, Tsarist Russia and Ottoman Turkey clashed over control of the region. Britain came to dominate the region in the early 1800s and maintained this status for 150 years. After World War I, the political map of the Middle East was redrawn due to the downfall of the Ottoman Empire. Since World War II, the Gulf region, which contains more than 60% of the world's known oil reserves, has been developed and modernized. In addition to oil, the Gulf region is known for its shrimp, fin-fish and pearl fisheries. Over the past century the traditional lifestyle of the region has been affected markedly by outside intervention and the extremely rapid modernization process. In addition to increased prosperity and living standards, this has generated considerable stress on both terrestrial and marine environments of the Gulf region.

The Gulf plays a key role in the life and heritage of the people of its seven riparian states: Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. It provides essential ecosystem services, such as fishery products, recreation and drinking water. The Gulf ecosystem is under extreme stress, both naturally as well as due to anthropogenic activities fuelled by the discovery of enormous oil and gas reserves in the region. It has been subject to impacts from, drilling, refining, dredging and land filling, as well as from worldwide maritime transportation. Major natural and human-induced stressors affecting the Gulf Ecosystem include salinity, temperature extremes, habitat loss, sedimentation and turbidity and pollution. Marine pollution due to the oil industry and rapid, poorly planned coastal development has been the main problem. Environmental stress in the Gulf is further compounded by the lack of natural freshwater input into the Gulf from the Shatt Al-Arab. These are particularly critical in view of the semi-enclosed nature of the Gulf with limited water exchange to the open Arabian Sea. The entire Gulf may be considered as a 'pollutant trap'. In addition, the Gulf environment and its people have suffered from the Iran-Iraq war in the early 1980s and from Iraq's invasion of Kuwait in 1990 and the subsequent Gulf War.

Despite an overall awareness that ecosystem health is a critical factor in achieving national and regional environmental and developmental goals, the scientific information base that would allow adequate management interventions, or even informed decision making on resource use is largely lacking. Both biota and pollution transcend political boundaries, underlining the necessity of a regionally coordinated, integrated environmental management. The surrounding countries, in collaboration with international organizations, have initiated extensive measures for the protection and conservation of the Gulf. One recent initiative was the decision to publish a state-of-the-art monograph (sponsored by Kuwait Institute for Scientific Research: KISR) which addressed and documented thoroughly the complex subject of the ecosystem health and sustainability of the Gulf. The Aquatic Ecosystem and Management Society (AEHMS) co-sponsored the book project and coordinated the task of publishing the peer reviewed monograph (edited by Khan, Munawar & Price, 2002) under its *Ecovision World Monograph Series*. Following the landmark publication of the Gulf book the AEHMS initiated the organization of an international conference involving all the riparian countries at the United Arab Emirates University (UAEU), Al-Ain in 2005. Dr. Waleed Hamza, Head, Biology Department of UAEU was invited to co-host the conference. The proposal received much encouragement and support

from Dr. Maitha Al-Shamsi, Assistant Provost for Research, UAEU. Consequently The first international conference on the “State of the Gulf Ecosystem”, jointly organized by the UAEU and the AEHMS, was held from 5-7 March 2006 in Al-Ain, U.A.E. The conference focused on:

- Enhancement of environmental awareness of the Gulf in the light of its continued exposure to intensive human-induced stress
- Adoption of integrated, ecosystemic, multi-disciplinary, multi-trophic and holistic approaches in science and management
- Provision of possible remedies for problems associated with oil and gas industry pollution in air, water and sediments
- Prediction of the future threats that the Gulf environment faces by adopting ecosystem, habitat and food web modeling approaches
- Promotion of monitoring and research programs of international standards to generate an environmental data base for the Gulf, involving all riparian countries

Conference themes included human stressors; air, water and sediment quality; climate change; biodiversity and exotics; marine and wetland ecology; habitat degradation, restoration and remediation; ecosystem health and management. More than 200 scientists from all Gulf countries and from many other parts of the world participated, delivering more than 100 presentations in 16 sessions (Invited plenary: 10; Oral: 63; posters: 29). Additionally, two workshops were organized dealing with: 1) renewable resources management and regional cooperation and 2) the possibility of a Gulf Ecosystem Health and Management Agreement (GAMMA) amongst the riparian countries. Educating students and young researchers about the importance of ecosystem health, the ecological heritage of the Gulf Region, and their role in conservation was a key aim of the conference, providing opportunities to build capacities and acquire research experience at current international scientific and technological standards.

A selection of the papers presented at the conference is being published in this special issue of “Aquatic Ecosystem Health and Management”. Starting with an overview of multiple stressors affecting the Gulf environment and a plea for ecosystem-based management, the special issue analyses impacts of large-scale human interventions, such as river diversion, damming,

marsh drainage and restoration, as well as small-scale developments, including tourism projects taking the marine environment into the desert. It includes a report on baseline ecological surveys in a protected area and describes the use of remote sensing for monitoring of coastal communities and long-term changes in the coastal zone. Levels of petroleum hydrocarbons in water and sediments, and crab induced regeneration processes after a major oil spill are analyzed. One paper reports on the sub tidal crab biodiversity of the Iranian coast. The volume concludes with a report on the development of a marine and coastal resource atlas, and a review of UNESCO's activities with regards to the Gulf ecosystem. We are confident that this compendium of research and review papers will contribute to filling gaps in knowledge on the Gulf environment and stimulate further research, enhancing our knowledge base for a meaningful environmental management.

It gives us great pleasure to express our deep sense of appreciation to H.H. Sheikh Nahayan Mubarak Al-Nahayan, Minister of Higher Education and Scientific Research, Chancellor of UAE University, and Patron of the Conference for his outstanding support. Dr. Maitha Salem Al-Shamsi, Assistant Provost for Research provided overwhelming support right from the very beginning of the conference. Thanks are also due to Dr. Mohamed Al-Azab, Associate Dean of the College of Science, UAE University for his encouragement. We express our gratitude to the members of the Steering, Scientific, and Local Arrangement committees, who spared no effort in making this conference a full success. Huda Al-Hassani and Jennifer Lorimer are gratefully acknowledged for skillfully running the conference secretariats in the U.A.E. and Canada. The AEHMS Publication Committee coordinated the Gulf special issue. We are grateful to the editorial expertise provided by Jennifer Lorimer, Iftekhhar Munawar, Ahmad Munawar, Lisa Elder, Susan Blunt, Heather Niblock and Mark Fitzpatrick and for their meticulous and hard work towards the publication of this special issue. We thank the anonymous referees, who took it upon themselves to review the papers submitted for publication. Finally, we are most grateful to the UNESCO Regional Office in the Arab States of the Gulf, Doha, Qatar for the generous financial support towards the publication of this special issue. We hope that this special issue will be useful to all the researchers, students and managers in improving our understanding of the Gulf ecosystem today and its conservation tomorrow.

Chief Editor:

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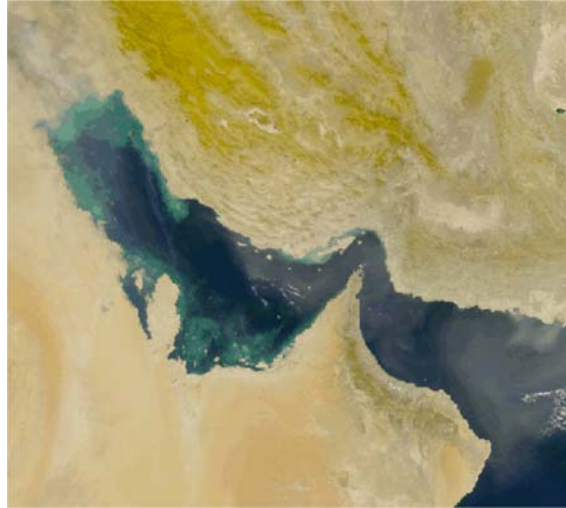
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