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Knowledge for All

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Workshop No. 5

Blue Gulf: New Models and Systems for Regenerative Environments and Communities in Changing Climates and Rising Seas

1. Directors

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2. Abstract

This workshop aims to highlight the challenges faced by coastal settlements in the GCC region in balancing urban development with the preservation of fragile coastal and marine ecosystems and natural resources. Coastal cities, large ports, and industrial facilities are compromising environmental protection and water security in a region faced with low rainfall, and high evaporation rates. Climate change further threatens the region with rising temperatures, sea-level increases, coral reef loss, and coastal infrastructure vulnerabilities. This workshop aims to develop concrete strategies and explore solutions to implement.

"Blue Design" in coastal cities of the GCC, including actionable plans for improving urban sustainability and resilience, considering water cycles, energy efficiency, and the integration of various disciplines. Furthermore, the workshop will foster an environment where participants can explore how their expertise can contribute to the goals of "Blue Design" and a resilient "Blue Gulf" and build knowledge to prepare coastal cities for rising sea levels and changing weather conditions, with an emphasis on the integration of water, energy, food, and waste into a unified urban system.

3. Context

The Blue Gulf: Sweet and Saline Waters. Climate adaptation is important in the GCC region as temperatures and sea levels are predicted to continue to rise, resulting in the loss of coral reefs, decline in fish stocks, and threats to coastal industries such as desalination plants, due to damage from rising sea levels, high winds, storms, and tornadoes. Despite these risks, the impacts of climate change on the Gulf and adaptation opportunities in the region have not yet been fully assessed.

At the recent COP27, it was highlighted that the Gulf region requires a robust evidence base that can guide marine climate action in the region, which includes collaborating with all states around the shores of the Gulf, going beyond national borders. Large urban settlements built on reclaimed land, large commercial ports, and industrial infrastructures occupy the shores and spread across the territorial waters of the Gulf and the GCC territorial waters, at the expense of the fragile coastal and marine ecosystems.

Water security is an ongoing challenge in the GCC due to the hot climate, low rainfall, and high evaporation. Water consumption is high and Gulf states rely on non-renewable aquifers and costly desalination to supply their populations, with negative environmental impacts. The reuse of treated wastewater is still limited and the combination of the impacts of climate change, population growth, and rapid economic development will put additional pressure on scarce water resources. The ecological state of the natural and marine environments is in sharp decline, calling for comprehensive socio-ecosystem-based management approaches and transboundary strategies.

Building climate resilience requires active interventions and practical solutions to build healthy ecosystems, such as coral gardening, mangrove planting, and integrated coastal zone management plans. It also requires regional collaboration, multi-stakeholder engagement, and transboundary approaches such as those being developed by the Organization for the Protection of the Marine Environment (ROPME) to implement the Blue Carbon regional action plan on marine climate change. Blue Carbon is carbon captured and stored in the marine environment and blue carbon ecosystems provide a wide range of environmental and societal benefits that are essential for climate change adaptation including coastal protection and food security.

Scientific diplomacy across borders can build Blue Bridges that can contribute to mitigating the negative impact of the climate crisis, as well as preparing revitalisation design strategies that foster collaboration between diverse sectors of communities, organisations, and stakeholders to inspire a holistic vision of our fresh water and marine environments and to strengthen our coastal resilience. Biodiversity conservation cannot be successful unless local communities receive their fair share of benefits from and assume a greater role in managing local biological resources.

4. Focus/objectives

Blue Gulf: Importance and topics. Blue Design is proposed here as a methodology with three approaches: It focuses on the relationship between oceans and urbanization (Blue Urbanism); It is a water-based urban design (Saline and Sweet Blue Networks); it promotes an active, rather than passive, approach to design (green to blue). Green has been the colour

of sustainability for many years. In the context of the current climate emergency, diminishing natural resources, and acceleration of biodiversity loss, we need to shift from the concept of green and passive design towards systems that give back more to the planet and the environment than they take.

Blue Design was coined by Saatchi and Saatchi in 2008, reaching beyond a passive or carbon-neutral approach to one that regenerates, repairs, remediates, and restores our environments and communities. Sylvia Earle, oceanographer and National Geographic Explorer reminds us that “the world is blue. Everyone everywhere is inextricably connected to and utterly dependent upon the existence of the sea.” Blue urbanism takes as a starting point the facts that our human fate here on the blue planet is intimately tied to ocean health and that two-thirds of our global population lies within 400 kilometres of a shoreline. With a blue approach to development and regeneration, it is necessary to consider all forms of water cycles - sweet and salty - and all water sources (black, grey, recycled, produced) as well as the energy needed to produce, distribute, and recycle the water.

Gulf countries experience low rainfall, but extreme weather conditions can induce flooding, especially in impermeable urban environments. Capturing rainwater, and allowing it to flow and be absorbed, are important aspects of blue urban design, which follows the concept of the sponge city. With green design, we talk about carbon neutrality while blue design creates places that go beyond carbon neutrality and add surpluses to the world, representing a fundamental shift in how engineers, designers, and policymakers approach design, planning, and policymaking. The measures of successful design in the future will include the level of giveback the project generates for its occupants as well as for the greater global community. To reverse global warming, we can no longer be passive in our designs. Instead, we need to be active and restore the planet and its resources.

Additionally, we also tend to think of water, energy, food, and waste as being separate concepts. Today, we envision buildings, landscape, and urbanism as an integrated system, in symbiotic relationships with nature. It is necessary to prepare coastal cities for the future rise of the sea level and changing weather with resilient bioregenerative design and planning that demands the intervention and expertise of a wide range of professionals such as economists, biologists, chemists, and also a range of social science experts, such as demographers, anthropologists, and geographers.

5. Papers focus/topics

- Regional climate impacts and risks to marine biodiversity and coastal society
- Implementing climate change action plans. Practical solutions and case studies.
- Clean water and sanitation (SDG 6) and urgent actions to combat climate change and its impacts (SDG 13) focused on new technologies and bridging the gap between practitioners and academia to achieve sustainability.
- Life-cycle environmental impacts of water systems and desalination including energy efficiency, renewable energy sources, and materials derived from waste (brine).
- Blue design and edge ecologies. The development of bioregenerative landscapes and infrastructures within integrated coastal zone management
- Blue infrastructure and urbanization. Landscapes and systems of efficient water management and reuse in coastal cities.

- Bioremediation and constructed wetlands in drylands. Reusing wastewater for leisure landscape, urban greening, biodiversity, and carbon capture.
- Circular and regenerative urban systems and the nexus between water, food, energy, and waste.
- From green to blue. From passive to active. Regenerative projects that give back more to the environment.
- Earth-centric and nature-based Blue solutions with new technologies, AI, and machine learning.
- Blue carbon ecosystems that remove CO₂ and provide physical barriers to storms and coastal flooding
- Policies and multi-sectoral approaches with government, industry, and academia to develop practical solutions to the challenges of climate change

Paper proposals should fit as closely as possible with this workshop description, notably section 4, and the publication plans (section 7).

6. Paper structure, referencing, and format

Authors should adhere to the [GRM Paper Guidelines](#).

Participants who do not submit a paper by the 31 May 2024 deadline or whose submitted paper does not meet the requirements will be disinvented by GRCC.

7. Publication plans

Publication options include:

- A special edition of a journal with the selection of the best papers. Possible list of journals includes Ocean and Coastal Management; Journal of Environmental Management; Marine Policy, Environmental Development, and Land Use Policy. Priority will be given to high-ranking journals, but Open Access is also privileged to widen the distribution and accessibility of the information.
- An edited volume on the Blue Gulf with a publisher such as Anthem Press, Springer Nature, etc. is also foreseen.
- Papers that may not be publishable in the volume/special issue of a journal will still be reviewed by the directors and considered for individual publication in either a peer-reviewed journal or as a GRC paper.
- Directors will make reasonable efforts to ensure that all accepted papers are published in one of these forms.

8. References

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9. Directors' bio notes

Dr. Anna Grichting holds a Doctor of Design from Harvard University in Urbanism and she has experience in teaching, research, and practice in various institutional frameworks, including the public sector, NGOs, the private sector, and academia. She taught and conducted research at the Universities of Geneva, Harvard, MIT, and Qatar, and she is currently a non-resident Senior Research Fellow at the University of Vermont. Regenerative Urbanism, Circular Systems, and Resilient Communities are at the foundation of her architectural and urban activities, focusing on nature-based design, the food-water-energy nexus, university campuses as living laboratories, border landscapes, and participative design. Her approach engages with various stakeholders bringing together artists, researchers, scientists, international and local NGOs, and governmental institutions, and encourages bottom-up and community-led initiatives as well as participative processes. She focuses on Blue Urban Design - the design and planning of more efficient and resilient landscapes and urban projects that work with soft water and saline water systems, the land and seascapes, as well as the interfaces between the two systems and territories.

Dr. Ammar Abulibdeh holds a Ph.D. in Geography and Environmental Management from the University of Waterloo and an MAES in Applied Environment Studies in Local Economic Development, as well as a BSc in Civil Engineering. He is currently an Associate Professor in the Humanities Department at Qatar University and he has taught and conducted research in the Gulf Region including at Sultan Qaboos in Oman and in the United Emirates University. His research is focused on energy modeling, sustainable transportation, land use and land cover (LULC) dynamics, water-energy-food nexus, land suitability analysis, modernization and sociodemographic modeling, urban development, GIS, and remote sensing. He has published scientific papers and book chapters and attended international conferences and workshops related to his research topics.