



Our Goals

- Promote collaboration among researchers
- Promote Knowledge Exchange with stakeholders outside academia
- Generate a deep understanding of Middle Eastern coral ecosystems
- Promote their conservation and sustainable use

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Welcome!

Dear all,

we are pleased introduce the *Mid-east Coral Reef Society's* December 2015 newsletter!

With COP21, climate science is in the limelight. The media attention that the conference is generating means the world has never been better informed about the threat that rapid climate change poses to our planet. Central to COP21 was the idea of halting global temperature increases (this century) at the 2°C mark. The agreement of global powers to work together to curb emissions is encouraging, however, now the economies need to prove that they can put their intentions into practice. It is clear that coral reef ecosystems are already suffering from significant coral bleaching events on a global scale due to increased sea surface temperatures. With NOAA declaring the third ever global coral bleaching event that is predicted to continue well into 2016, the question of whether climate change-driven socioeconomic change will be timely and extensive enough to save a meaningful proportion of our reefs can only be answered in time. Even the heat tolerant

corals from mid-east reefs are not spared from temperature stress and included in this issue are reports about bleaching that started in the Central Red Sea this year.

Also in this issue is an article about the recent efforts of researchers from the Iranian National Institute for Oceanography and Atmospheric science (INIOAS) in the north-eastern Gulf and an interesting study on the rather unexpected bleaching sensitivity of corals in Hengam coral patches.

Another threat to coral reef survival that is frequently associated to temperature stress are coral diseases. These have been involved in significant mortality events in the Gulf in the past but their pathogenesis is as yet not fully understood (Riegl et al 2012, https://www.livingoceansfoundation.org/assets/2013/08/riegl_gulfdiseases.pdf). Please support the current efforts to improve the understanding and support the ongoing research by reporting diseases!

The work on the special issue of Marine Pollution Bulletin is

nearly completed and a broad range of exciting papers are already available online.

Finally, we are happy to support a call from our colleagues at the International Society for Reef Studies (ISRS) to nominate well-deserving colleagues at all stages of their careers for a number of prestigious awards.

If this is the first time that you see this newsletter and you are interested in the MCRS Initiative you can become a [member](#) and [subscribe](#) to receive the 6-monthly [newsletter](#) on our webpage <http://mideastcrs.org/>.

We welcome contributions about meetings and conferences relevant to the [Mid-east Coral Reef Society](#), as well as outreach events and links to recent publications.

With best wishes

Prof. J. Burt Prof. J. Wiedenmann



Recent research by scientists from the Iranian National Institute for Oceanography and Atmospheric Science (INIOAS)

by Jahangir Vajed Samiei

Ongoing research

Ecological monitoring of coral patches in the northeastern Gulf began in 2014. Photo and video surveys were carried out on fifteen 20m transects at five permanent sites established in coral patches of Hengam and Larak Islands (Fig. 1). Coverage of main benthic components; abundance and diversity of corals; prevalence of coral diseases and bleaching; and diversity and abundance of fishes were assessed. Concurrently,

density and diversity of phytoplankton, and environmental parameters including underwater temperature, salinity, dissolved oxygen, nutrients, carbonate chemistry, and PAH were evaluated (for further details see: <http://www.inio.ac.ir/Default.aspx?tabid=2615>).

Researchers are currently analyzing the data with the aim to characterize the status of ecosystems; identify natural and anthropogenic threats; detect temporal and spatial variation in abundance and

diversity of marine organisms; identify possible causes for changes and consider how the research outcomes are relevant for local people.

Previous findings

A study on bleaching sensitivity of corals in the Hengam coral patches indicated that corals from the families Faviidae, Pocilloporidae, Poritidae and the genera *Coscinaria*, *Psammocora*, *Turbinaria*, *Montipora* and *Symphylia* bleached after ~3 weeks of exposure to daily average water temperatures >33°C, while *Acropora downingi*, the dominant coral of the community did not bleach. This suggests that *Acropora downingi* may have a higher heat-tolerance in these habitats characterized by fast tidal flows and rapid tidal cooling (Vajed Samiei et al. 2014).



Figure 1. View of representative field sites at Hengam Island (a) and Larak Island (b), a photoquadrat (c), the benthic assemblage being processed by CPCe software (d).

In a laboratory based study, we explored the effects of thermal stress on autotrophic performance in *A. downingi* from the Iranian coast. Our results demonstrate that despite the high temperature tolerance of these corals at Hengam Island, local *A. downingi* populations may be impacted by future increases in sea water temperature (Vajed Samiei et al. 2015).

Current Challenges

Whilst the implementation of scientific research is an essential factor in the successful conservation of coral



Figure 2. A view of Hengam Island's coral community taken at August 2014. *Goniopora columna* was bleached (lower left corner), while *Acropora downingi* retained is normal color.

reefs, it is by no means the only factor. It may be argued that scientific research must be linked with society as its support is essential for the establishment, maintenance, propagation and ultimate impact of scientific findings. Personally, I believe that the link between coral reef science and society is currently fragile in the Gulf region and needs to be strengthened. Even in times of economic hardship initiatives such as those that facilitate the production of research-based documentaries highlighting the unique nature of the Gulf coral reef habitats and the related ongoing research may aid in strengthening coral reef science's place in society. The MCRS may aid reef-stakeholders by acting as a platform for discussion and a vehicle to promote and enact plans of action aimed at reef conservation.

References

- Vajed Samiei J, Saleh A, Mehdiinia A, Shirvani A, Sharifi H (2014) Specific thermal regime and coral bleaching pattern in Hengam Island, eastern Persian Gulf. *Journal of the Persian Gulf (Marine Science)* 5:15-26
- Vajed Samiei J, Saleh A, Mehdiinia A, Shirvani A, Kayal M. (2015) Photosynthetic response of Persian Gulf acroporid corals to summer versus winter temperature deviations. *PeerJ* 3:e1062 <https://doi.org/10.7717/peerj.1062>

Coral Disease Outbreak

A team of researchers from NYU Abu Dhabi, Zayed University and the University of Hawaii have been monitoring the progression of two types of diseases in the Arabian Gulf. This work is being undertaken to improve understanding of the environmental drivers of disease outbreaks and their impacts on different coral species. Preliminary results indicate that disease has been the leading cause of coral mortality on Abu Dhabi reefs from 2014-2015. If you have any sightings of disease that you would like to share with the team, please email these to: grace.vaughan@nyu.edu



Tissue loss diseases affecting *Porites* sp. and *Acropora* sp. colonies in the Gulf

Coral bleaching event in the central Red Sea

By Anna Roik, Till Röthig, Maren Ziegler and Christian R Voolstra
(Reef Genomics Lab, Red Sea Research Center, KAUST, KSA)

Coral bleaching, caused by increasing seawater temperatures, is one of the major threats to coral reefs worldwide. This September corals in the central Red Sea bleached in response to high summer water temperatures. The last recorded bleaching event in the region occurred in September 2010 (see Furby et al. 2013*), demonstrating the potential vulnerability even of Red Sea coral reefs to the threat of global warming.

To investigate the magnitude of this year's coral bleaching occurrence, the Reef Genomics Lab (P.I. Voolstra) and the Reef Ecology Lab (PI Berumen; both Red Sea Research Center, KAUST) initiated a joint effort to survey benthic communities and their bleaching percentage from nearshore to offshore sites. We are interested in identifying coral taxa that are most severely affected and in monitoring the subsequent recovery processes of the coral communities.

*Furby, K.A., Bouwmeester, J., Berumen, M.L., 2013. Susceptibility of central Red Sea corals during a major bleaching event. *Coral Reefs* 32, 505-513.



Bleached *Acroporid* table corals in the central Red Sea (13th September 2015, by Anna Roik)



Coral bleaching in a nearshore reef in the Central Red Sea (15th September 2015, by Maren Ziegler)

International Society for Reef Studies (ISRS) – Awards and Honors

The ISRS awards acknowledge the scholarship and work of members within ISRS. The ISRS solicits and encourages nominations from members of the ISRS for each of the awards listed below:

1. Young Scientist Award
2. Mid-Career Scientist Award
3. Eminence in Research Award
4. World Reef Award

Please think of well-deserving ISRS members and colleagues and submit a nomination! We encourage nominations of members from any country of origin. Additional details and nomination forms for each award can be found at <http://coralreefs.org/society-awards-and-grants/awards-fellowships/>

The closing date for receipt of nominations for each award or honor is **15 January 2016**. Nominations should be sent as a single .pdf or word file by email to the secretary of the Society's awards committee, Dr Andrea Grottoli at grottoli.i@osu.edu. The file should be named as AWARDNAME_NOMINATOR_NOMINEE.



The 1m² quadrat, a faithful companion of coral reef scientists. Here, marine biologist Remy Gatins collects data on juvenile corals in the Red Sea, Saudi Arabia.

Photo credits: Diego F. Lozano-Cortés"

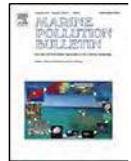
Recent Publications of MCRS members

Ziegler, M., Roder, C., Büchel, C., Voolstra, C.R., 2015. Niche acclimatization in Red Sea corals is dependent on flexibility of host-symbiont association. *Mar. Ecol. Prog. Ser.* 533, 149-161.

<http://www.int-res.com/abstracts/meps/v533/p149-161/>

Marine Pollution Bulletin Special Issue "Coral Reefs of Arabia"

Marine Pollution Bulletin (<http://www.journals.elsevier.com/marine-pollution-bulletin>) is currently producing a special issue following the success of the "Coral Reefs of Arabia" conference held at NYUAD in February. Over 35 manuscripts have been submitted encompassing a broad range of topics related to the coral reefs of the region. Papers are currently at the final stages of production and it is expected that the full issue will be available online by the end of the year. This special issue follows a 2012 special issue titled "Coral Reefs of the Gulf" which included 13 articles focusing on reef ecosystems within the Arabian Gulf.



The following articles are already available online:

- Levels of genetic diversity and taxonomic status of *Epinephelus* species in United Arab Emirates fish markets <http://www.sciencedirect.com/science/article/pii/S0025326X15301934>
- Internal bioerosion in dead and live hard corals in intertidal zone of Hormuz Island <http://www.sciencedirect.com/science/article/pii/S0025326X15301971>
- Productivity and sea surface temperature are correlated with the pelagic larval duration of damselfishes in the Red Sea <http://www.sciencedirect.com/science/article/pii/S0025326X15301958>
- Tight coupling between coral reef morphology and mapped resilience in the Red Sea <http://www.sciencedirect.com/science/article/pii/S0025326X15301776>
- Remote sensing of Qatar nearshore habitats with perspectives for coastal management <http://www.ncbi.nlm.nih.gov/pubmed/26632526>
- The changing dynamics of coral reef science in Arabia <http://www.sciencedirect.com/science/article/pii/S0025326X15301259>
- Homogeneity of coral reef communities across 8 degrees of latitude in the Saudi Arabian Red Sea <http://www.sciencedirect.com/science/article/pii/S0025326X15301740>
- Regional variation in the structure and function of parrotfishes on Arabian reefs <http://www.sciencedirect.com/science/article/pii/S0025326X15301867>
- Species-specific trends in the reproductive output of corals across environmental gradients and bleaching histories <http://www.sciencedirect.com/science/article/pii/S0025326X15301831>
- Living on the edge: Vulnerability of coral-dependent fishes in the Gulf <http://www.ncbi.nlm.nih.gov/pubmed/26602440>
- Oman's coral reefs: A unique ecosystem challenged by natural and man-related stresses and in need of conservation. <http://www.sciencedirect.com/science/article/pii/S0025326X15301612>
- Prickly business: abundance of sea urchins on breakwaters and coral reefs in Dubai <http://www.ncbi.nlm.nih.gov/pubmed/26563547>
- Colony size-frequency distribution of pocilloporid juvenile corals along a natural environmental gradient in the Red Sea <http://www.sciencedirect.com/science/article/pii/S0025326X15301235>
- Coral reef fish assemblages along a disturbance gradient in the northern Persian Gulf: A seasonal perspective <http://www.sciencedirect.com/science/article/pii/S0025326X15301247>
- The influence of extreme winds on coastal oceanography and its implications for coral population connectivity in the southern Arabian Gulf <http://www.sciencedirect.com/science/article/pii/S0025326X15301053>
- Current status of coral reefs in the United Arab Emirates: Distribution, extent, and community structure with implications for management <http://www.sciencedirect.com/science/article/pii/S0025326X15300783>
- An assessment of Qatar's coral communities in a regional context <http://www.ncbi.nlm.nih.gov/pubmed/26410180>
- The implications of recurrent disturbances within the world's hottest coral reef <http://www.ncbi.nlm.nih.gov/pubmed/26478453>
- Coral reefs in the Gulf are mostly dead now, but can we do anything about it? <http://www.sciencedirect.com/science/article/pii/S0025326X15300461>

Contributing to the newsletter:

Contributions are invited to the newsletter via email. Potential news can be references of publications in the interest areas of the MCRS Initiative, descriptions of research projects, job advertisements, etc. We cannot guarantee that all contributions can be accepted and we reserve the right to shorten contents.

Please submit your suggestion via email to newsletter@mideastcrs.org

Contact / Subscribe : The Mideast Coral Reef Society Initiative mideastcrs.org (general contacts)

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