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Creating opportunities through science symposia

For most marine scientists, unless we work in the field of fisheries development or at the interface of science and policy, it is rare to feel that we are making an impact on the lives of people in the wider community. Most research scientists at universities and government laboratories also have limited opportunity to engage with schools and the general public outside of once-a-year open days. But beyond the science and networking, conferences, especially international conferences, can provide a myriad of opportunities for us to redress both these issues in a way that enriches all. Here, we describe the programme of development-related activities that supported the 6th International Jellyfish Blooms Symposium, and their impact, and we urge it be used as a template for other scientific meetings in the future.

Jellyfish are far more than merely an interesting find on the beach. On the one hand, when abundant, jellyfish can cause economic harm to the tourism, aquaculture, fisheries and energy sectors¹, but on the other hand, they provide food for other animals, e.g. turtles, shelter for juvenile fish and a potential resource to exploit². In recognition of their role in marine ecosystems, the international jellyfish community updates and renews itself at a conference every 3 years or so. The first meeting was held in the USA in January 2000 and after conferences in Australia, Argentina, Japan and Spain, Africa's turn came in 2019, after Monty Graham (University of Southern Mississippi) convinced one of us (M.J.G.) to host the conference at the University of the Western Cape.

'Whilst Africa may have witnessed the evolution of *Homo sapiens sapiens*, she is nevertheless young and inexperienced ... in so many ways. Consequently, the conference will focus on development in its broadest sense...'. These sentences open paragraph two on the conference webpage (<http://www.jellyfishbloom2019.co.za>), and effectively encapsulated our thoughts on both the science programme and ancillary activities.

Partnerships

As any who have tried will know, organising a conference single-handedly is impossible. Small universities with a limited staff complement generally have neither the budget nor the skill set to organise conferences, and expertise to advise on non-core activities is missing. The University of the Western Cape is no exception in this regard. Thus, in order to achieve our development goals, the University of the Western Cape actively sought partner institutions with a footprint in public engagement and education outside the tertiary education space: private enterprise (Two Oceans Aquarium) and the local natural history museum (Iziko Museums of South Africa).

Although the Two Oceans Aquarium is a premier tourist attraction at the V&A Waterfront development in Cape Town, it plays a very important role in regional and national education, conservation and research. Together with an active volunteer programme, more than 20 years' experience in adult education and a comprehensive schools programme beginning with the early childhood development phase, it has recently been developing and driving the implementation of a marine sciences curriculum for Grades 10–12, which is already being offered at various pilot schools as an additional subject.

Iziko Museums of South Africa operates 11 national museums in Cape Town, housing natural history, social history and art collections in magnificent historical buildings. The Iziko South African Museum is the oldest and largest museum in South Africa and boasts an impressive history of scholarship and education. There is a strong commitment to engaging with diverse communities through various school outreach and enrichment programmes, as well as empowering and inspiring visitors through education. Half a million people visit Iziko's museums each year and around 50 000 school learners are guided through its galleries by museum educators and curators.

Reaching out

At all previous International Jellyfish Blooms conferences, the only representation from sub-Saharan Africa had been limited to the author (M.J.G.) or his students. But jellyfish are not only a southern African issue³, and so if, as a community, we are going to develop 'in-house'⁴ jellyfish science on the continent, we need to identify and sponsor participation by scientists and students from countries beyond South Africa. Through various contacts at the UN Food and Agriculture Organization, and targeted advertisement, four delegates were identified from elsewhere in Africa: one each from Morocco, Senegal, Ghana and Cameroon. All four are working on jellyfish in their home countries, either as postgraduate students or as part of their work in government laboratories. Sponsorship for their attendance was secured from two sources: the National Research Foundation of South Africa, through a grant to M.J.G., and conference registration fees. It is common practice when organising conferences to fund the costs of plenary speakers using the latter. For this conference, however, we omitted plenary talks, which had the further beneficial effect of making all delegates equal, and used these monies to help cover the costs of African colleagues. Local student mentors were assigned to chaperone and assist each African visitor, for all of whom the trip was the first to South Africa.

After the conference, our African guests participated in a 2-day workshop on jellyfish identification at Iziko's Natural History Museum, led by André Morandini from São Paulo in Brazil and Ilka Straehler-Pohl from Stade-Hagen in Germany. These two experts gave of their time freely to participate, recognising it as an opportunity to build links with Africa for potential future collaborations and for a chance to see recently collected material from the region. This was also an occasion on which to access global experts for taxonomic determination/validation of the jellyfish collections of both the University of the Western Cape and Iziko.

In their feedback, the African delegates had this to say:

I have gain[ed] a lot both in knowledge and connections. I have the opportunities, now it is the time to go forward ... I will use [the] contacts I made to carry out collaborative research, applying for grants and fellowships.

Giséle FG Youbouni, PhD candidate, Cameroon

The networking I made during the conference was great and the knowledge gained will help improve the quality of my research.

Prisca Adongo Ayerijenna, MPhil candidate, Ghana

I'm not sure how often these events come around but you are welcome to contact us again and we'll try to help if we can.

Nini van der Walt, Red and Yellow

Educational outreach

Branding

If you talk to people who work in advertising, they will tell you that branding is everything. While we may be generalising, our experience is that most science students today cannot tell a Monet from a Manet and while they may be able to think creatively in their discussions, their abilities to behave similarly in the arts are generally limited. We turned to the Red and Yellow Creative School of Business for assistance with the conference brand. Red and Yellow is a small tertiary-level institution that trains students, primarily in marketing, advertising and communications. Following an interactive lecture to students on jellyfish and the conference, Red and Yellow gave students the option to submit a design for the conference logo as one of their formal assignments. Almost half the class opted in for the project: staff at the design school selected the shortlist (Supplementary figure 1), from which we identified the winner (Figure 1). All shortlisted designers were invited to the conference dinner, and the winning logo was displayed on all letterheads, bags, T-shirts, etc.



Figure 1: The winning design.

Feedback from educators at Red and Yellow was as follows:

The students enjoyed the experience of working with a real 'client' because they stood a chance of having their work displayed in the world outside the classroom. It's always exciting for students when their work makes it into the professional arena, and they get a taste for their future career.

Connor Cullinan, Red and Yellow

In designing the conference poster (Figure 1), we approached local wildlife photographer Steve Benjamin. Steve, who is more than your average citizen scientist, happily shared some of his photographs of jellyfish with us and allowed us to use one of his images as a backdrop for the poster.

Public engagement

Open lectures given by selected conference delegates should be mandatory at conferences. At the very least they represent an opportunity for the taxpayer to see how public money is spent; at best they give local audiences a chance to hear about latest developments and to engage with international experts. With the 'Ocean Exhibit' as a backdrop, Two Oceans Aquarium hosted a relaxed evening during which three of the international conference delegates gave 30-min informal talks on: jellyfish venoms, how they work and how to treat them (Angel Yanagihara, Hawaii); interactions between jellyfish and humans (Lucas Brotz, Vancouver); and real and potential uses of jellyfish (Dror Angel, Haifa). The evening was a sell-out!

This was a once-in-a-lifetime opportunity to learn more about jellyfish, friend or foe, from world experts. What a fascinating, informative and fantastic event. Thank you.

Ingrid Sinclair, Two Oceans Aquarium

The conference itself was hosted by Iziko, on the fifth floor of their iconic building at the top of The Company Gardens in central Cape Town. Afternoon poster sessions were held in the whale well, so called because of the whale skeletons hanging from the ceiling. This latter area is open to the public during the day, and day visitors to the museum had the opportunity to engage with the conference indirectly.

Iziko Museums have a group of dedicated educators who work with visiting school groups. Several weeks prior to the conference, during National Marine Week, around 200 school learners were invited to participate in 'JellyArt'; a multidisciplinary activity that saw learners create jellyfish artworks from recycled materials and pen a message/question for the delegates of the symposium to consider. These JellyArt works were displayed during the symposium, further continuing the conversation with the general museum visitors (Supplementary figure 2). During the conference itself, a young-at-heart and charismatic delegate gave up time to present a public lecture entitled 'The Light and Dark Side of Jellyfish' and also participated in school-room classes given by museum educators, enjoying the opportunity to work with a diverse and receptive audience.

Creating commercial opportunities

A few marine biologists are likely to have a tattoo of their study organism somewhere on their body, and many probably have work-themed paraphernalia at home and/or in the office. Recognising this inclination, and given the high levels of unemployment in South Africa, we set out to engage with local entrepreneurs who could provide delegates with locally crafted gifts for retail.

We approached the Craft and Design Institute (CDI), a Cape Town based craft and design sector development agency with a mission to develop capable people and build responsible creative enterprises trading within local and international markets. With funding from the Western Cape Department of Cultural Affairs and Sport, the CDI was able to run a free workshop at the Two Oceans Aquarium, which was well attended by interested crafters, many of whom had never visited the venue before. This day-long event was a themed product design and creativity workshop aimed at stimulating products that could be sourced for the Symposium and followed a short presentation to the attendees on jellyfish with a view to sparking ideas for unique goods.



The result was that seven crafters developed a range of items from earrings, through socks and cushion covers, to lamps, mobiles and children's toys, as well as bags and clothing. Items were available for sale at the poster evenings and all social events: a catalogue of items offered can be found on the conference website. It was the first time that the CDI had been involved in a project such as this and they appreciated the initiative.

Sales were generally good and most crafters indicated that, although there were challenges, it was a success:

Such an awesome journey we all took and persevered right to the end ... was worth it.

Lewis Ndlovu, Kingsdale Emporio

I'd definitely like to get involved in more conferences around animals and natures!!!

Nehanda Magan, Nehanda Design

I will be happy to do it again with such kind friendly and great people.

Joseph Kalango, Design Cradle

Feedback from the CDI:

This product development opportunity was such a good experience for producers to make money and be successful. I think this can be attributed to the 'narrow', defined parameters of the project. Parameters of a defined theme (that is visually inspirational), a price range, and the security of a definite interested audience. It is an excellent, not too risky a project format for people learning, to be involved in. I want to use this model going forwards as an iterative learning and consolidating experience.

Fran Stewart, CDI

The way forward

In relatively small conferences such as this (we had 150 delegates from 23 countries), it is customary for prospective hosts of the next meeting to make a bid. In Cape Town, two institutions came forward: the University of British Columbia, Canada and the University of Kerala, India. Immediately prior to voting at the closing dinner, Lucas Brotz announced

that the University of British Columbia was withdrawing its offer to host the next meeting, because he felt that the momentum generated around development in Cape Town needed to be carried forward. Although India has a rich jellyfish diversity and harvests almost 100 000 tons annually, there are very few scientists there who study them, primarily owing to a lack of capacity. The striking similarities between India and South Africa suggest that the development focus in Cape Town, could be successfully repeated there, with support from the community.

Support from the community appears to be strong. In our post-symposium questionnaire, we expressly asked whether delegates appreciated the development initiatives we had put together, and the feedback was resoundingly positive. Over 90% of respondents were interested by our engagement with local crafters and 60% purchased at least one item from them; almost 80% of respondents appreciated the school outreach and 57% indicated that they would be happy to participate in such activities at future conferences, time permitting.

Given this level of support from a relatively small international conference, imagine the impact of a much bigger conference. The International Congress of Zoology is meeting in Cape Town in 2020, the 14th International Conference on Copepoda is being held in the Kruger National Park in 2020 and the International Ornithologists Union is gathering in Durban in 2022. Not to mention local conferences, some of which attract more delegates than the specialised international ones. With careful planning, as a socially responsible academy, we can and should provide opportunities for the wider community in as many of our endeavours as possible.

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