Sea Around Us

Mi Querida Argentina (My Beloved Argentina)

by Lucas Brotz

The Third International Jellyfish Blooms Symposium, organized by Dr. Hermes Mianzan and his colleagues, was held in Mar del Plata, Argentina from July 14-16, 2010. I was extremely fortunate to attend, as travel to South America can be both expensive and protracted. Although I met with numerous flight delays and lost luggage, my experience in Argentina was not to be dissuaded, thanks primarily to the gracious and affable hosts.

Previous International Jellyfish Blooms Symposia were held in Alabama (2000) and Australia (2007). As jellyfish have been raising their prominence in both scientific and popular media of late, there was much to discuss. Over 100 delegates attended the symposium, representing more than 25 countries. This diversity was reflected in the extensive variety of posters and presentations, which ranged from understudied microscopic digenean parasites, to the increasing frequency of blooms of the giant jellyfish (*Nemopilema nomurai*). The latter - behemoth jellies which can reach over 2 metres in size and can weigh over 200 kilograms - used to bloom roughly every 40 years in Asia. But since 2002, swarms of the giant jellies have been wreaking havoc for fishers in China, Korea, and Japan on an almost annual basis (Uye 2008). Other jellies also appear to be blooming more frequently in select locations around the globe, and were predictably the focus of many discussions.

The keynote address was given by Dr. Daniel Pauly, who also gave the keynote at the 2007 symposium. Dr. Pauly will be the first to admit he is no medusologist, but the small community of jellyfish scientists is

Lucas dives with jellyfish in Indian Arm, B.C.
Photo by Conor McCracken

keenly aware that knowledge from neighbouring disciplines can be extraordinarily informative and valuable. Dr. Pauly spoke about new investigations uncovering links between destructive fishing methods and increased jellyfish populations. While the exact mechanisms underlying these relationships still remain to be understood, it appears that the removal of jellyfish predators and the alteration of marine food webs may ultimately lead to more jellies (Pauly *et al.* 2009).

A potentially more important factor affecting jellyfish populations is the removal of benthic communities through bottom-trawling. Fish are active, visual predators and therefore require reasonably clear, oxygenated water to forage. Jellies on the other hand, are mostly tactile feeders and have a much higher tolerance for low

Continued on page 2 - Jellyfish

The Sea Around Us Project Newsletter

Issue 60 – July/August 2010

... a global picture of changes in coastal jellyfish populations is beginning to emerge.

Delegates at the Third International Jellyfish Symposium.

Jellyfish - Continued from page 1

oxygen conditions. As benthic communities typically help filter the water and keep the bottom consolidated, the removal of these organisms through trawling and dredging may therefore benefit jellyfish populations. As we continue to plunder our marine ecosystems and remove excess amounts of fish and other marine wildlife, it appears that jellyfish may be moving in to fill the void.

I was also granted the opportunity to present at the symposium and further expound on our work. In order to identify the correlations between increased numbers of jellyfish and destructive fishing methods, we first need to understand the scope of changes in jellyfish abundance. While the dearth of longterm datasets makes this a challenge, we are using methods that allow the inclusion of anecdotal information. Marine professionals such as scientists and fishers observe local environments on a frequent basis and are therefore in a unique position to identify changes and expand the limited knowledge of jellyfish population dynamics. To account for a wide range of observational data, we are weighting information based on space, time, and reliability. Those weighted data are then stratified and pooled by Large Marine Ecosystem, and a global picture of changes in coastal jellyfish populations is beginning to emerge. While methods incorporating anecdotal data are not accepted in all scientific circles, we found encouragement and support for our approach at the symposium. A final endorsement came near the end of the symposium when I was awarded runner-up in the student presentation category. Judging by the quality of other presentations at the symposium, this was a most humbling honour.

The three days of conference activities were well-organized and executed, facilitating endless dialogue and continual collaboration between colleagues. The festivities culminated with a celebratory feast which highlighted not only renowned Argentinian wine, but also their *asador* – a massive barbeque where entire racks of beef are grilled over hot coals. It was evident to all who attended that Argentinians are impeccable hosts, and I became even more aware of this fact after the conference ended.

Continued on page 3 - Jellyfish

The ***Sea Around Us*** project newsletter is published by the Fisheries Centre at the University of British Columbia. Six issues of this newsletter are published annually. Subscriptions are free of charge.

Our mailing address is: UBC Fisheries Centre, Aquatic Ecosystems Research Laboratory, 2202 Main Mall, Vancouver, British Columbia, Canada, V6T 1Z4. Our fax number is (604) 822-8934, and our email address is SeaNotes@fisheries.ubc.ca. All queries, subscription requests, and electronic address changes should be addressed to Megan Bailey, *Sea Around Us* Newsletter Editor.

The *Sea Around Us* website may be found at www.seaaroundus.org and contains up-to-date information on the project.

The Sea Around Us project is a scientific collaboration between the University of British Columbia and the Pew Environmental Group. The Group supports nonprofit activities in the areas of culture, education, the environment, health and human services, public policy and religion. Based in Philadelphia, the Group makes strategic investments to help organizations and citizens develop practical solutions to difficult problems. In 2000, with approximately $4.8 billion in assets, the Group committed over $235 million to 302 nonprofit organizations.

ISSN 1713-5214 Sea Around Us (ONLINE)

Jellyfish - Continued from page 2

As this was my first visit to South America, I chose to stay in Mar del Plata after the conclusion of the symposium to extend my Argentinian experience. Mar del Plata is the unofficial surf capital of Argentina, and I had brought along my wetsuit with the hope that I might have a chance to experience my first waves in the southern hemisphere. Any surfer knows that a surfboard is a precious and easily-damaged possession. But upon hearing of my interest, I was promptly loaned a board without hesitation by a local who I'd barely met. This Argentine generosity was demonstrated even further when I returned the surfboard and was invited in for tea. However, this was not just any tea, but South America's famous *mate*.

More than a hot drink, *mate* is a tradition and a ritual. Made from the dried leaves of *Ilex paraguayensis*, *yerba mate* is placed in a small gourd by the *cebador* (server) and filled with hot water. The tea is then sipped through a *bombilla*, a silver straw which filters the tea leaves. The gourd is passed clockwise among friends and family, and each has a turn sipping the potent brew, after which the *cebador* refills the gourd with hot water and passes it on. It is rare to share a beverage in any culture, and with *mate*, that is almost entirely the point. It is seldom served in cafés or restaurants, and many tourists can spend an entire trip without sampling the potion. I felt privileged to be invited into this circle, and as I shared tea and stories with my new friends, I revelled in Argentinian hospitality.

I have since returned home to Canada, again trading hemispheres and thankfully, seasons. Fortunately, I brought some *yerba mate* back with me. Now, whenever I share this ceremony with my friends and family I will fondly remember the productive symposium, our gracious hosts, and *mi querida Argentina*.

References

Pauly, D., Graham, W., Libralato, S., Morissette, L. and Palomares, M.L.D. (2009). Jellyfish in ecosystems, online databases and ecosystem models. *Hydrobiologia* 616 (1): 67-85.

Uye, S.-I. (2008). Blooms of the giant jellyfish *Nemopilema nomurai*: a threat to the fisheries sustainability of the East Asian Marginal Seas. *Plankton and Benthos Research* 3 (Supplement):125-131.

Has BP "made it right"?

by Jennifer Jacquet

The April 20th explosion of the Deepwater Horizon oil rig (leased by BP) and subsequent failure of Halliburton construction (responsible for plugging holes in the pipeline) resulted in an unfettered flume that released an estimated 172 million gallons of oil into the Gulf of Mexico. For comparison, the 1989 Exxon Valdez tanker spill was estimated at 11 million gallons. That the U.S. uses around 20 million barrels of oil each day is even more useful for perspective. The oil spilled by BP could fuel the American machine for just nine days.

I spent two weeks of July in the Gulf of Mexico trying to better understand the ecological and political issues around the BP oil spill, which President Obama called "the worst environmental disaster America has ever faced." Beside the equivalent of nine U.S. days of oil, BP used more than 1.8 million gallons of dispersant (Corexit) in the cleanup (hopefully the irony of using dispersal for cleanup is self-evident), even though similar products are banned in Europe. Many people I spoke to were equally concerned about the Corexit as they were about the oil. Will consumers want to buy Corexit fish from the Gulf in the future?

BP used more than 1.8 million gallons of dispersant in the cleanup.

The platform explosion killed 11 workers, injured 17 others, and the tally of wildlife deaths currently includes more than 80 mammals, 550 sea turtles, and 5500 birds. I visited the International Bird Rescue's Buras, LA operation, where they took many of the oiled pelicans, gulls, and terns in an Orwellian process involving Dawn dish soap, high-pressure hoses, tender loving care, and at least four vet techs, followed by a week of rest and a flight or long ride to Georgia or Florida for release; and just when things were getting better for the Brown pelican (*Pelecanus occidentalis*), too. In November 2009, the Brown pelican was delisted from the U.S Endangered Species List and pointed to as an icon of success for legislative actions like banning DDT and protecting bird habitat. The BP oil spill is impacting the recovered pelican population (an estimated 16,000 pairs nest along the Louisiana coast) and their nesting sites, which has sparked talks of a relisting.

Continued on page 4 - Gulf

A team of vet techs washes a Brown pelican at the IBRRC in Buras, LA (left)., and a shrimp boat in BP's Vessel of Opportunity program hauling boom to clean up oil off of Grand Isle, LA (right). *Photos by Jennifer Jacquet.*

Gulf - Continued from page 3

In addition to the immediate ecological losses, there are economic losses with most fishermen and seafood processors out of work due to fishing closures (high-end restaurants and condos are also losing money due to a decline in tourism). The seafood processors (e.g. Alabama's Bayou le Batre community, the largest seafood processing industry in the Gulf and more than 50% Vietnamese) seem to be hurting most. Although BP is obligated to compensate for these economic hardships, I heard there are complications due to the fact that a lot of fishing business is done under the table and BP does not acknowledge economic losses without the paperwork.

BP is aware of every data insufficiency because of their involvement in every discussion related to clean up and future recovery. This is their spill.

But many fishermen are making more money than they would have fishing. This was also true after the 1989 Exxon oil spill, Exxon transferred "life-changing sums of money" into the hands of fishermen and created "spillionaires" by commissioning fishing boats for the clean up, explained Charles Wohlforth, a former reporter on the Exxon spill, in his recent book *The Fate of Nature*. BP has adopted a similar strategy and euphemistically call it the Vessels of Opportunity program, which is short-term but financially attractive. I heard one fisherman in the Vessel of Opportunity program say that the BP oil spill was God's way of redistributing wealth.

While some outcomes of the oil spill, like blackened birds, out of work fishermen, and clean-up costs, make headlines, other outcomes are less obvious. Scientists I spoke with, such as Ken Heck at Dauphin Island Marine Station, are concerned about increased mortality during the larval phases of fish and invertebrates, which are planktonic and not able to avoid patches of oil the way free-swimmers might. Experiments conducted after Exxon Valdez have shown that very small amounts of oil can have sublethal affects as well. Fortunately for BP, the ecology of the Gulf was already crippled, and they know it. Other scientists, including a few from The US Fish & Wildlife Service, say this is their major point of concern. They worry BP will subvert the recovery process because there is inadequate baseline data. BP is aware of every data insufficiency because of their involvement in every discussion related to clean up and future recovery. This is their spill.

While we're comparing the Exxon and BP spills, it's worth noting a recent headline in the New York Times about how "BP's Oil Spill Bill Could Dwarf Exxon's Valdez Tab". In both nominal and real terms, this headline is true. In U.S. dollars, the cost of the Exxon clean up was $2 billion (1989 dollars), corresponding to $3.58 billion today. This is in comparison to the cost of the BP clean up, estimated at $6.1 billion. However, this headline greatly ignores the fact that the BP oil spill dwarfed Exxon's. If we standardize for size of the spill, BP's tab is much lower. Given that the BP spill is more than 15 times larger than the Exxon spill, we could assume BP should spend 15 times more on cleanup than Exxon did, or around $53.7 billion dollars — $47.6 billion more than BP has spent.

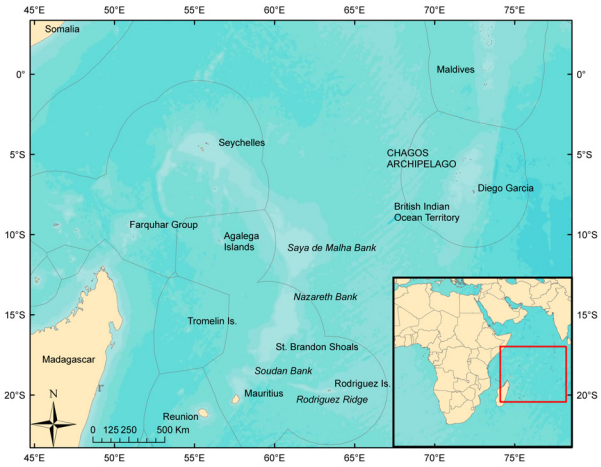
Soon after the spill, BP began strategizing and spending on a major ad campaign to convince the public that BP "will get this done" and "make it right". There are plenty of reasons to doubt that BP will make the Gulf right. As we all know, talk is cheap - even if their communication campaign has cost BP more than $50 million.

Publications Mail Agreement No: 41104508

Reconstructing the catches of Mauritius

by Léa Boistol, Sarah Harper, Shawn Booth and Dirk Zeller*

In early 2010, we undertook a catch reconstruction study of Mauritius and its outer Islands. Our group's task was to estimate likely total removals of marine resources by Mauritius from 1950 to 2008. The method for catch reconstruction aims to account for Illegal, Unreported and Unregulated fisheries catches (IUU) through estimation approaches (e.g., Zeller *et al.*, 2007). Indeed, although countries are often aware of such unreported catches, they are generally not taken into account in the officially-reported statistics. However, when considering the effects of fisheries on marine ecosystems, knowledge of total fisheries removals is important. In addition, small-scale fisheries are the mainstay of inhabitants of many small island countries worldwide, and therefore knowledge of their importance in terms of catches is essential if a sustainable future for fisheries is the goal.

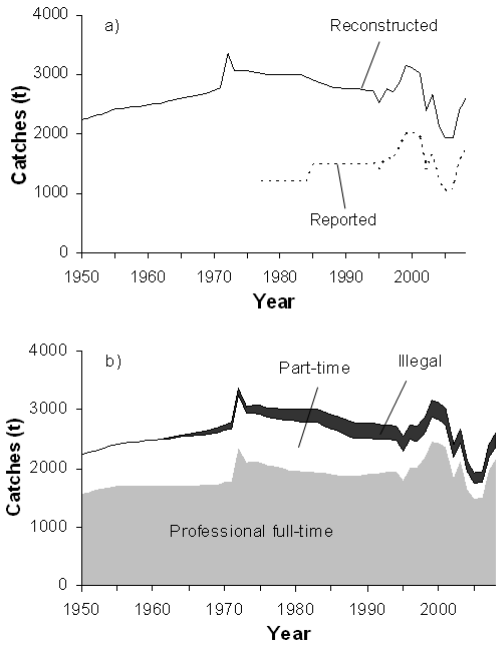


Map of the western Indian Ocean region with Exclusive Economic Zones (EEZ) represented. By Kristin Kleisner.

Mauritius is located some 850 km east of Madagascar, and is an island state comprising several dependencies in the western Indian Ocean, namely the islands of Rodrigues, St Brandon shoals and islets, and the twin islands of Agalega. On Mauritius and Rodrigues, the main populated islands, lagoon and inshore fisheries remain an important source of employment and food security. On both islands, most of the people who exploit the inshore areas are not commercial, but subsistence fishers, i.e., people in search of a meal, or to supplement their income. Also, in response to an increasing demand for seafood, coupled with reduced catches and new regulations, many fishers have recently resorted to illegal fishing methods, using fine-meshed nets, illegal spearguns and landing undersized fish (Hollup, 2000). Moreover, Mauritius is visited by an increasing number of tourists each year, and these visitors, partly through their recreational activities, add to the fishing pressure on marine resources. Although such catches have been mentioned previously (Pearson, 1988), they have never been estimated over a long time period, even though long time series of fisheries catches are necessary to evaluate the ecological effect of fisheries on marine ecosystems.

For 1950-2008, our total reconstructed catches for the state of Mauritius were 42 percent higher than the official statistics reported by Mauritius to FAO. This discrepancy was largely due to the under-reporting of small-scale catches for Mauritius and Rodrigues islands, which represented 25 and 23 percent of the total reconstructed catches, respectively. For both islands, this discrepancy was largely due to the inclusion of part-time fishers in our estimated catches. Also, one of the advantages of our study is that it permits the discrimination of the Mauritian fisheries catches by islands and fishing areas, whereas the publically reported catches for Mauritius do not.

One of the advantages of our study is that it permits the discrimination of the Mauritian fisheries catches by islands and fishing areas.



Reconstructed small-scale catches for Rodrigues Island 1950-2008. Top: reported and total reconstructed small-scale catches; Bottom: total reconstructed small-scale catches by category of fishers with nearshore illegal catches.

Continued on page 6 - Mauritius

Mauritius - Continued from page 5

Apart from the small-scale catch component, our total reconstructed catches include estimates of catches for the important Mauritian fishery carried out on offshore oceanic banks, sport fisheries for pelagic species, near-shore recreational catches, and discards of the industrial tuna purse seine fishery.

Our study illustrates the urgent need for better reporting of catches for the various fisheries sectors of Mauritius, especially for the small-scale fisheries sector, which provides food and a source of income for a large portion of the population. In Mauritius, depletion of marine resources is a concern. Although management legislation exists since colonial days, it only limits the use of specific gears, and suggests fish reserves and closed seasons for nets (Hollup 2000). Regulations should include access limitations to the fisheries resources of the lagoon area. However, alternatives are also needed for the numerous fishers who depend on these resources for their livelihoods.

References

Hollup, O. (2000) Structural and sociocultural constraints for user-group participation in fisheries management in Mauritius. *Marine Policy* 24: 407-421.

Pearson, M.P. (1988). Rodrigues. Rapid survey of the status of exploitation and environmental damage of the lagoon and coral reefs off Rodrigues. Report prepared for the project assistance to artisanal fishers and development of outer-reef fishery. FAO, Rome. 49 pp.

Zeller, D., Booth, S., Davis, G. and Pauly, D. (2007) Re-estimation of small scale fisheries catches for the U.S. flag-associated island areas in the Western Pacific: The last 50 years. *Fishery Bulletin* 105:266-277.

*Léa Boistol joined the *Sea Around Us* project from January to June 2010, as part of her graduate studies at the Centre d'Océanologie de Marseille, France.

2010 publications, January-August

Alder, J., Cullis-Suzuki, S., Karpouzi, V., Kaschner, K., Mondoux, S., Swartz, W., Trujillo, P., Watson, R. and Pauly, D. (2010) Aggregate performance in managing marine ecosystems in 53 maritime countries. *Marine Policy* 34: 468-476.

Bailey, M., Sumaila, U.R. and Lindroos, M. (2010) Application of game theory to fisheries over three decades. *Fisheries Research* 102: 1-8.

Brown, C.J., Fulton, E.A., Hobday, A.J., Matear, R., Possingham, H., Bulman, C., Christensen, V., Forrest, R., Gehrke, P., Gribble, N., Griffiths, S., Lozano-Montes, H., Martin, J., Metcalf, S., Okey, T., Watson, R. and Richardson, A.J. (2010) Ecological interactions will determine winners and losers under climate change in marine ecosystems and fisheries. *Global Change Biology* 16: 1194-1212.

Cheung, W.W.L, Lam, V.W.Y, Sarmieno, J.L., Kearney, K., Watson, R., Zeller, D. and Pauly, D. (2010) Large-scale redistribution of maximum fisheries catch potential in the global ocean under climate change. *Global Change Biology* 16: 24-35.

Christensen, V. (2010) MEY = MSY. *Fish and Fisheries* 11: 105-110.

Dalleau, M., Andréfouët, S., Wabnitz, C., Payri, C., Wantiez, L., Pichon, M., Friedman, K., Vigliola, L. and Benzoni, F. (2010) Use of habitats as surrogates of biodiversity for efficient coral reef conservation planning in Pacific Ocean islands. *Conservation Biology* 24: 541-552.

Jacquet, J., Hocevar, J., Lai, S., Majluf, P., Pelletier, N., Pitcher, T., Sala, E., Sumaila, U.R. and Pauly, D. (2010) Conserving wild fish in a sea of market based efforts. *Oryx* 44: 45-56.

Ma, H., Townsend, H., Zhang, X., Sigrist, M. and Christensen, V. (2010) Using a fisheries ecosystem model with a water quality model to explore trophic and habitat impacts on fisheries stock: A case study of the blue crab population in Chesapeake Bay. *Ecological Modelling* 221: 997-1004.

Swartz, W., Sumaila, U.R., Watson, R. and Pauly, D. (2010) Sourcing seafood for the three major markets: The EU, Japan and the USA. *Marine Policy* 34: 1366-1373.

Wielgus, J., Zeller, D., Caicedo-Herrera, D. and Sumaila, U.R. (2010) Estimation of fisheries removals and primary economic impact of the small-scale and industrial marine fisheries in Colombia. *Marine Policy* 34: 506-513.