Member's report on activities related to ICRI

Brazil

Reporting period November 2016 – November 2017

1. **Contribution to the ICRI Plan of Action 2016-2018.** *Your responses to the following questions will assist the Secretariat in assessing contributions towards the major themes of the current ICRI Plan of Action (http://www.icriforum.org/icri-secretariat/current)*

Theme 1 – "Help raise awareness of how coral reefs and related ecosystems help to fight climate change"

- *Goal 1-1: highlight the contribution of coral reefs, mangroves and seagrasses to mitigate and adapt to climate change and its impacts*

Question: Do you have examples of solutions provided by coral reefs and coastal systems to mitigate and adapt to climate change?

Coral reefs: Studies addressing climate change and coral reefs have goals to understand and to investigate the effects of climate change and SST anomalies on these ecosystems (Leão et al., 2016). No study about solutions provided by coral reefs to mitigate and adapt to climate change in Brazil have been published, although the importance of coral reefs on coastal protection against erosion is well known, and there are some examples relating coral reef degradation and subsequent coastal erosion that has required intervention.
Mangroves: a Brazilian Mangrove Atlas is being prepared to be launched soon and it will probably have example on this topic. ICRI will be informed about it. But until now research group still try to identify impacts of climate change on mangroves in Brazil, as reported by Schaeffer-Novelli et al., 2016 and Bernardino et al. 2016.
Seagrass: According to a recent review article (Copertino et al. 2016): "The scarcity of large-scale and long-term studies allowing the detection of changes in the structure, abundance and composition of seagrass habitats and associated species still hinders the investigation of such communities with respect to the potential effects of climate change. The current conservation status of Brazilian seagrasses and SVA (submerged aquatic vegetation) is critical. Knowledge of the prevailing patterns and processes governing seagrass structure and functioning along the Brazilian coast is necessary for the global discussion on climate change." "In addition to the description and quantification of still-unknown meadow areas, experimental approaches (especially in long-term studies) are still much needed in Brazil. By addressing spatial and temporal variations in multiscale approaches and by developing experimental protocols, the Brazilian scientific community will be able to better address the extent and implications of projected changes and the associated fluctuations in carbon stock".

Question: Are you planning to add in your NDC the importance of coral reefs / mangroves?

The NDC, recently implemented in Brazil, does not mention coral reefs/mangroves specifically. However, NDC uses the National Adaptation Plan for Climate Change (PNA) as an implementation tool, which recognizes the ecological, economic and social importance of these environments for Brazil. One of the PNA's goals is to increase marine and coastal Conservation

Units (in number and extent). This measure is cited as the most important tool to guarantee the maintenance, recovery, and preservation of coral reefs and mangroves. Additionally, in a chapter dedicated exclusively to the coastal zone, the National Adaptation Plan recognizes the importance of these environments for the physical protection of the coastline and also cites coral reefs and mangroves as providers of valuable economic resources. Therefore, although these ecosystems are not explicitly named, they are addressed in the NDC, as they are included in the coastal and marine zone, which is contemplated extensively in NDC's implementation plan.
The NDC in Brazil is to be revised every 5 years from 2020 on, and it's fair to predict that the next Contribution will address coral reefs and mangroves specifically.

Theme 3: "Help to reduce human threats to coral reefs and associated mangroves and seagrasses, by making greater use of regulatory tools"

- *Goal 3-1: promote legal frameworks for the protection of coral reefs and associated mangroves and seagrasses, with quantified targets and effective enforcement to protect these ecosystems*

Question: What are the legal frameworks for the protection of coral reefs and associated mangroves and seagrasses in place in your countries? If you already replied to the previous request, you don't need reply

In 2000, Brazil created the National System of Conservation Units (SNUC) (Law 9,985, July 18, 2000) gathering all existing instruments and regulations, constituting a framework for the creation, implementation, consolidation and management of protected areas. In 2006, Brazil established the National Strategic Plan for Protected Areas (PNAP) with the commitment to consolidate a comprehensive, ecologically representative and effectively managed protected area system integrated with broader land and marine landscapes by 2015. The PNAP attends the deliberations of World Summit for Sustainable Development, Strategic Plan of Convention on Biological Diversity and National Environmental Conferences.

In this context, the Marine and Coastal Protected Areas Project (GEF Mar) started in 2014 with the main objective is to support the creation, enlargement and implementation of a representative and effective system of marine and coastal protected areas to reduce biodiversity loss. GEF Mar is financed by the Global Environmental Fund with 18.2 million dollars approved by the World Bank. The goal of project is to increase the marine protected area from 1.57 to 5%, totaling 175,000 km^2, most of this percentage must include coral reefs and associated ecosystem. Brazil is strongly committed to creating at least 10% of new MPAs, including areas with coral reefs such as São Pedro and São Paulo Archipelago and the submerged reefs at the mouth of the Amazon River recently mapped. Several studies are in progress to elaborate the processes of creation of new MPAs.

Brazil is signatory of five international MPAs conventions: Convention on Biological Diversity 2010, United Nations Convention on the Law of the Sea, Ramsar Convention on Wetlands of International Importance, International Coral Reef Initiative e The World Heritage Convention. In addition, Brazil is member of The Regional Seas Conventions. Therefore, the effective creation of Marine Protected Areas is a commitment assumed by Brazil.

Brazil has also internalized the Aichi Biodiversity Targets by Resolution CONABIO (National Biodiversity Commission) n. 06, September 3, 2013.

National Action Plan Action is underway in Brazil for both ecosystems, mangroves and coral environments (Legal Order ICMBIO n. 19, March 9, 2016). The Action Plans are detailed in the next question.

Under the Brazilian Forest Code, mangroves, including hypersaline tidal flats were considered permanent preservation zones. However, in 2012 the national congress voted a reform of the forest code (Law n. 12.651, May 25, 2012) and hypersaline tidal flats were excluded from protection against land development and mariculture, in particular shrimp farming, with some safe conduct provided in the Law n. 12.727, October 17, 2012, as to protect

adjacent mangroves, among other requirements. A Ministry of Environment Normative Instruction n. 03, April 16, 2008 does not allow shrimp farm in mangroves within Protected Areas.
Environmental crimes law (n. 9.605, February 12, 1998) that provides for fines and detention penalty for activities harmful to the environment, including corals (casting vessels or throwing debris of any kind on banks of mollusks or corals, duly marked in nautical chart) and mangroves (Destroying or damaging native or planted forests or dune-fixing vegetation, which protects mangroves, which is the object of special preservation).

Question: Did you to set quantified targets to protect their coral reefs, mangroves and seagrasses? And are you able to provide a % of what is currently protected in your country? Please define what you mean by protection?

Currently, only 1.57% of Brazil's seaboard territory is under the Marine and Coastal Protection Areas Network (MCPA), instituted by the Federal Government in 2000. The Marine and Coastal Protected Areas Project (GEF Mar), described above, will take place to expand the existing MCPA until 2019/2020 and also to promote its long term financial sustainability by developing innovative financing mechanisms. Joint efforts have been made within the scope of the GEF-Mar, mainly in 2016 and 2017, meaning a great opportunity for Brazil to achieve part of the international goals of conservation of marine ecosystems and biodiversity. An example of ongoing action is the contracting of consultancies by FUNBIO to compile and gather information necessary to support the process of expansion of the Abrolhos National Marine Park, and creation and implementation of Amazonas River Mouth Protected Area, Foz do Rio Doce Protected Area and Vitoria Trindade Chain Protected Area.

Besides GEF Mar, Brazil implemented National Plan of Action for conservation of ecosystems, coral reefs and mangroves.

National Action Plan for Coral Environments Conservation (PAN Corais) includes and establishes priority conservation strategies for 52 species of fish and aquatic invertebrates considered to be endangered, listed in the National List of Endangered Species. Simultaneously, it establishes strategies for the conservation of 11 other species that are known to benefit from the maintenance of the latter. The with a validity period until February 2021.
PAN Coral will be implemented in 18 focus areas located along the Brazilian coast, from the State of Maranhão to Santa Catarina, including areas within the Exclusive Economic Zone, in addition to its territorial sea.
10 specific objectives were defined:
I – To promote the integrity and maintenance of habitats, ecosystem services and populations of target and benefited species.
II – To contribute to the management and monitoring of fishing activity in coral reef environments.
III –To use ecosystem-based approach to promote the sustainable exploitation of fish stocks
IV – To enhance the general knowledge about coral reef environments that are still poorly investigated.
V – To minimize use conflicts and negative impacts to the coastal and marine region inflicted by activities and enterprises that directly or indirectly affect coralline environments.
VI – To contribute to the organization of tourism activity in coral environments in order to minimize its impact, considering the local socioeconomic situation.
VII – To prevent the introduction and spreading of invasive exotic species in coral reef environments and evaluate and mitigate impacts in already affected regions.
VIII – To evaluate and minimize chemical, physical, organic and biological pollution in coral environments.
IX – To promote the revision, integration, innovation and effectiveness of the current public policies considering the sustainability of coral environments perspective, in the social, environmental and economic contexts, broadening and strengthening participatory mechanisms and social control in the management of territories.

X – To evaluate and highlight the role of environmental services of coral reefs in climate change related issues and its impacts, as well as to develop strategies for the successful mitigation and adaptation of these environments based on the building of specific scenarios.
The previous objectives comprehend 146 actions and over one hundred organizers and contributors of various institutions.
Periodic Assessment: The action plan will be evaluated annually to review and adjust the implemented measures. In addition, a mid-term evaluation is expected to be administered half-way through the project's cycle and a final assessment, to be administered in the end of the management cycle.

The National Action Plan for the Conservation of Threatened and Economically-Important Species of the Mangrove Ecosystem (PAN Manguezal) is aimed at conserving Brazilian mangroves, reducing degradation, and protecting the focal species of the National Action Plan, maintaining their areas and traditional uses, based on the integration between the different instances of both the public power and society, incorporating traditional and academic knowledge.

It is made up of eleven specific objectives, each with its own actions, being:

I. Contribute to the effectives of territorial planning in areas of mangrove and associated ecosystems (landholding regularization/ territorial planning)
II. Contribute to the strengthening of social participation and integration between government agencies by means of public policies on strategic areas of the PAN Manguezal.
III. Adequate the legislation in accordance with regional specificities for the implementation of fisheries and aquaculture management at the areas of the PAN, taking into consideration the participation of traditional people and communities.
IV. Reduce impacts resulting from different types of pollution and from the introduction of exotic species at mangroves and associated ecosystems.
V. Reduce habitat loss and expand mangrove and associated ecosystem's recovery and conservation areas.
VI. Reduce risks of environmental accidents and mitigate their socio-environmental impacts in activities that directly or indirectly affect mangrove and associated ecosystems.
VII. Strengthen the supervision and monitoring of licensed enterprises with potential for negative impacts, as well as mangrove and adjacent areas.
VIII. Inhibit the implantation and expansion of economic enterprises that result in negative impacts for the mangrove ecosystem.
IX. Contribute to the eradication of shrimp farms and salt evaporation ponds' enterprises at the intertidal zone, and to the recovery of ecosystems already affected by these practices.
X. Train social agents and managers involved in the PAN Manguezal.
XI. Elaborate communication strategy for the PAN Manguezal.

Other initiative is the Project "Mangroves of Brazil". Half of mangrove's area is concentrated on the North region of the country and 87% of mangroves are located inside federal, state or municipal Protected Areas. The project Mangroves of Brazil was conceived by the Ministry for the Environment, with the objective of improving Brazil's capacity in promoting the effective conservation and sustainable use of resources in mangroves, based on the strengthening of the National System of Conservation Units, and on the designation of permanent preservation areas for all Brazilian mangroves.

The project is executed by the Chico Mendes Institute for Biodiversity Conservation which, in order to reach this goal, aims at elaborating a management strategy for protected areas for the effective conservation of a representative sample of Brazilian mangroves, acting mainly on existing shortcomings that compromise management effectiveness, promoting the conservation and sustainable use of mangrove ecosystems, and the environmental services and functions necessary for national development and the well-being of coastal communities.

It is expected that the actions will assist on the conservation of 568.000 ha of mangroves of global relevance, besides generating positive impacts on the livelihoods of communities which

depend on this ecosystem. The project will enable the replication of lessons learned to all Brazilian mangroves. This initiative has also naturally aligned with the Sustainable Development Goals of the 2030 Agenda, especially with Goal 14, "Conserve and sustainably use the oceans, seas and marine resources". The initiative, supported by resources of the Global Environment Fund (GEF), aims at developing actions for the effective management and conservation of mangrove areas, acting along the Brazilian coastline.

- *Goal 3-2: encourage a ban on plastic microbeads in cosmetic products*

Question: How did you implement the recommendation to reduce plastic microbeads pollution in marine environment?

Brazil has undertaken a voluntary commitment to the World Ocean Conference, in June 2017, titled "Development of a national strategy to combat marine litter." Brazil must follow UN Resolutions on the subject - Resolution 1/6 and Resolution 2/11, which mention a ban on microbeads as a goal, but, at the same time, urges people to reflect on the cost-effectiveness of the alternatives. It is important to mention that Brazil should follow UNEA.
The private industries and services are already aware of the issue but have not yet commented specifically on the microbeads matter in a clear and specific way.
Between 6 and 8 of November 2017, the Ministry of Environment, in partnership with the United Nations Environment Program and the Oceanographic Institute of the University of São Paulo (IOUSP), held the 1st National Seminar to fight marine litter, with support from the World Animal Protection and the Consulate General of France in Rio de Janeiro. The meeting was attended by the Brazilian Minister of the Environment, Deputy Consul General of France in Rio de Janeiro, representative of UN Environment in Brazil, researchers and civil society representatives.
The event had conferences about the history and national panorama of Brazilian marine litter; socioeconomic, environmental and biodiversity impacts and ways to fight this matter. Actions and good practices in progress to combat litter at sea were also presented, as an example of Paraty, an important tourist destination in Rio de Janeiro State that banned disposable cups on boats, beaches, and islands. Impacts of micro and nano plastic particles were also discussed.
This was the first step towards the development of the National Plan to Combat Marine Litter by the federal government. In 2018, sectoral meetings will decide which recommendations should be included in the National Plan.

- *Goal 3-3: improve regulation and enforcement to reduce direct anthropogenic damage due to dredging and physical alteration of reef structures*

Question: are you working on this topic? If yes, could you please share with us your work. Please note that the information provided will help us to develop a recommendation for the next ICRI General Meeting. Please send us information as soon as possible.

In Brazil, harbors and dredging activities must be licensed by state and national Environmental Agencies. Federal environmental licensing is done by the Brazilian Institute for the Environment and Natural Renewable Resources (IBAMA). Also, to obtain authorization for marine disposal of dredged material, an environmental licensing protocol must be followed according to the CONAMA (Brazilian National Council of the Environment) resolution 237/1997. In addition, CONAMA published another resolution 454/2012 establishing general guidelines and reference procedures for the management of material to be dredged in marine areas within national jurisdiction. An environmental monitoring program is also required to identify and quantify the impacts that may be caused by dredging. Water turbidity is monitored, based on a risk scale, through fixed oceanographic stations regularly calibrated to issue warnings and stop dredging while the turbidity lies above acceptable range levels. Nevertheless, these resolutions do not prevent Marine Protected Areas near harbors and dredging areas from being affected by the

impacts of such activities. If a Protected Area is affected by dredging activities it receives an environmental compensation. Article 36 of SNUC (Brazilian National System for Conservation Areas) determines that in cases of environmental licensing for constructions of significant environmental damage, the entrepreneur is forced to upkeep the implementation and maintenance of an Area of High Level Conservation, or, in case it affects a specific Conservation Area, or its buffer area, that area it should be one of the beneficiaries for the compensation, even if it's not a High Level Conservation Area. However, the compensation value doesn't amount to more than 0.5% of the cost of the project.

- *Goal 3-4: promote the deployment of mooring devices limiting the mechanical destruction of coral reefs and seagrasses*

Question: are you working on this topic? If yes, could you please share with us your work. Please note that the information provided will help us to develop a recommendation for the next ICRI General Meeting. Please send us information as soon as possible.

The rules on anchoring in coral reefs and seagrass in Brazil, when existing, are only for MPAs and are recommended in actions in the management plans of these MPAs. For example, Abrolhos National Marine Park has mooring devices on sandy areas for tourist and research boats, the number of boats is also controlled. At Rocas Atoll Biological Reserve, where only research is allowed, a fixed mooring is used by the boat that takes the research teams to the Atoll. At Fernando de Noronha National Marine Park, an important tourist destination and diving, in most dive sites the boat anchorage is not authorized. At Costa dos Corais Marine Protected Area (sustainable use), anchoring is not allowed in coral reefs and seagrass in 135 km extension, however enforcement is a challenge in such a large area.
Example: Public Use Plan for Abrolhos: "…the number of vessels allowed to operate will be conditioned to the quantity and distribution of mooring points, to avoid anchoring over the reef or algae bottom". The anchoring system consists in determining fixed points for diving activities and, upon local approval by the Brazilian Institute for the Environment and Renewable Natural Resources, a stainless-steel cable may be attached to parts of the reef top *(chapeirão*). At the other end of the cable, a tire is attached (preferably painted red to facilitate location) at an approximate depth of 2.5 meters below the surface at high tide.
The system allows the master of the vessel, sailor or the one responsible for the diving operation, to easily see the diving spot. Upon seeing it, a cable coming from the vessel is passed through the tire, returning it to the vessel. With this maneuver, the need for installing moorings or releasing anchors on the *chapeirão* is eliminated, thus avoiding damage to its structure. The geographic coordinates of those points should be widely disclosed by the Park. The suggested model is based on the diving operation carried out in other Conservation Units of several countries such as Bonaire, Grand Cayman, Bahamas, Papua New Guinea, Australia and others. This model is adopted for its cost vs. benefits relationship, since it is efficient and of low cost and maintenance, compared to other models.

- *Goal 3-5: review issues related to the impact of sunscreens and other endocrine disruptors on coral reefs, and encourage the production of sunscreens that are proven not to damage coral reefs*

Question: are you working on this topic? If yes, could you please share with us your work. Please note that the information provided will help us to develop a recommendation for the next ICRI General Meeting. Please send us information as soon as possible.

Theme 4: "Monitor the state of reefs in order to better manage them"

- ***Goal (4) 1: promote regional reports on the health of coral reefs***

Brazilian National Coral Reefs Monitoring Program is underway since 2002, covering 7 MPAs, with a methodology compatible with Reef Check, but more comprehensive, thus gathering more detailed data. The program is conducted as a partnership between the Brazilian Institute of Environment (ICMBIO)/Ministry of Environment and the Federal University of Pernambuco, with local support from other Universities, NGOs, Dive operators and volunteers. The program is presently funded by the GEF-Mar project. Other coral reef research programs, conducted by University research groups, NGOs and collaborators also include monitoring activities on specific sites along the distribution of coral reefs in Brazil.

Results from the National Coral Reef Monitoring Program and other initiatives have been previously reported on the global status of the Reef Series during the previous GCRMN phase, when Brazil was part of the SA node. Under the new phase, in which the publication of regional reports is prioritized, Brazil is not yet part of any regional network and thus not featured on the 2014 publication of the Status and Trends of Caribbean Coral Reefs.

As part of the ICRI plan of action, "the Secretariat will encourage the publication of reports for regions in which work has not yet begun or is underway." A manual of methods and a report on the results of Brazilian coral reef monitoring program is under preparation at the moment to be released in 2018 during the IYOR. Therefore we would like to line up with the GCRMN in order to

1-line up this initiative with the UNEP Coral Reef Unit guidelines, that we understood have been/will be produced for the regional reports, and

2- align with the Caribbean coral reef monitoring network for sharing and interchange of methods and expertise.

The methods proposed by the GCRMN-CARIBBEAN GUIDELINES FOR CORAL REEF BIOPHYSICAL MONITORING are compatible with the protocols adopted in Brazil and further collaboration and networking with the present GCRMN coordination and the Caribbean coordinators will certainly improve the effectiveness of actions along the region.

- *Goal 4-2: better monitor the phenomena of coral bleaching*

Question: How did you implement the recommendation on addressing the decline in coral reef health due to global bleaching events?

Coral bleaching monitoring is conducted under the National Coral Reef Monitoring Program, and by many research groups and collaborators working on specific sites along the distribution of coral reefs in Brazil. Among those, there are four Long Term Ecological Projects (PELD) linked to the ILTER network and financed by the Brazilian National Research Council that monitor Brazilian coral reef sites and report bleaching events. Bleaching events synchronized with global climate related bleaching have been registered for Brazilian reefs since the 90's. In 2016, a large scale bleaching event, of moderate intensity, was observed in several sites along 2000 km of coast and in Oceanic islands. Coral bleaching has been surveyed using different methods compatible with both Reef Check and AGGRA protocols. Preliminary results did not detect mass coral mortality in Brazil post 2016 bleaching event, corroborating with Leão et al. (2016) findings for previous bleaching episodes that did not report mass coral mortality on Brazilian reefs since 1998.

Theme 5: "Progress via education"

- *Goal 5-1: prepare for the 2018 International Year of the Reef (IYOR)*

Question: How did you implement the Recommendation designating 2018 as the third International Year of the Reef? Please let us also know what are you planning to celebrate IYOR2018.

Brazilian Ministry of Environment is elaborating communication plan for several IYOR2018 celebration actions through the next year. The actions will be carried out in partnership with NGOs, universities, research groups, private initiative, prefectures of important areas with coral reefs along the Brazilian coast. The plan consists in releases in social networks and diving magazines, awareness campaigns on coral reef conservation, exposure of photos and videos, and other activities. The Brazilian Coral Reef Monitoring Program will launch a book with more than 15 years of results and status of Brazilian coral reefs. The IYOR2018 celebrate plan will be aligned, when possible, with Ramsar Convention National Strategy to be carried out also in 2018.

Please also list the educational material that you've developed in the past, so we can share it on the IYOR website.

In Portuguese:
Coral Reef Conservation Campaign.
Marine Environmental Conservation Campaign.
Beach Conservation Campaign.
All available at: http://www.mma.gov.br/biodiversidade/biodiversidade-aquatica/zona-costeira-e-marinha/campanhas-de-conservacao-da-biodiversidade-marinha

In English and Portuguese:
Atlas of Coral Reef Protected Areas in Brazil available at:
http://www.terrabrasilis.org.br/ecotecadigital/images/abook/pdf/2016/agosto/Agos.16.27.pdf

Question: Would you like to report on one of your activities during the ICRI GM meeting?

2. **Publications.** Please list relevant publications/reports (related to the ICRI plan of action) you have released during this reporting period.

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Bernardino, A.F.; Pagliosa, P.R.; Christofoletti, R.A.; Barros, F.; Netto, S.A.; Muniz, P.; Lana, P.C. 2016. **Benthic estuarine communities in Brazil: moving forward to long term studies to assess climate change impacts.** Brazilian Journal of Oceanography, 64(sp2): 81-96.

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Horta, P.A,; Riul, P.; Amado Filho, G.M.; Gurgel, C.F.D.; Berchez, F.; Nunes, J.M.C.; Scherner, F.; Pereira, S.; Lotufo, T.; Peres, L.; Sissini, M.; Bastos, E.O.; Rosa, J.; Munoz, P.; Martins, C.; Gouvêa, L.; Carvalho, V.; Bergstrom, E.; Schubert, N.; Bahia, R.G.; Rodrigues, A.C.; Rörig, L.; Barufi, J.B.; Figueiredo, M. **Rhodoliths in Brazil: Current knowledge and potential impacts of climate change.** Brazilian Journal of Oceanography, 64(sp2): 117-136.

Leão, Z.M.A.N.; Kikuchi, R.K.P.; FERREIRA, B.P.; NEVES, E.G.; SOVIERZOSKI, H.H.; OLIVEIRA, M.D.M.; MAIDA, M.; CORREIA, M.D.; JOHNSON, R. 2016. **Brazilian coral reefs in a period of global change: A synthesis**. Brazilian Journal of Oceanography, 64(sp2):97-116.

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Tedesco, E.C.; Segal, B.; Calderon, E.N.; Schiavetti, A. 2017. **Conservation of Brazilian coral reefs in the Southwest Atlantic Ocean: a change of approach**. Latin American Journal of Aquatic Research, 45(2): 228-245.

Zilberberg C.; Abrantes, D.P.; Marques, J.A.; Machado, L.F.; Marangoni, L.F.B. (Org). 2016. **Conhecendo os Recifes Brasileiros. Rede de Pesquisas Coral Vivo.** Museu Nacional, UFRJ. Série Livros 58. 360 p. (book in Portuguese available at: http://coralvivo.org.br/producao-academica/#cat_2).

3. **General Information.** (Note that this information will be posted on the ICRI website on your member page: http://www.icriforum.org/about-icri/members-networks.)

Member type (Country / Organization):	
Focal Point 1:	
Name:	Carlos Scaramuzza and Paula Moraes Pereira
Title/Organization:	Brazilian Ministry of the Environment
Email:	carlos.scaramuzza@mma.gov.br and paula.pereira@mma.gov.br
Focal Point 2:	
Name:	Beatrice Padovani Ferreira
Title/Organization:	Federal University of Pernambuco
Email:	beatrice@ufpe.br

Thank you very much for sharing your valuable experiences and information with ICRI.