

# The Latin-American Ocean Acidification Network (LAOCA)



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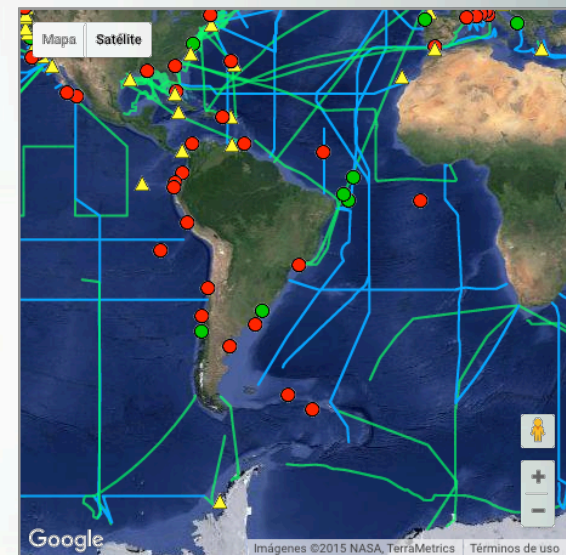
## What is our real capacity in Latin-American for ocean observation?

- Today Latin America appears as one of the regional nodes with relatively scarce information on Ocean Acidification over whole world.
- But ... that's the reality?



### **Interactive Map of Ocean Acidification Platforms**

Building on the existing global oceanic carbon observatory network of repeat hydrographic surveys, time-series stations, floats and glider observations, and volunteer observing ships, the interactive map below offers the best information available on the current inventory of global OA observing platforms. This is a strong foundation of observations of the carbonate chemistry needed to understand chemical changes resulting from ocean acidification.

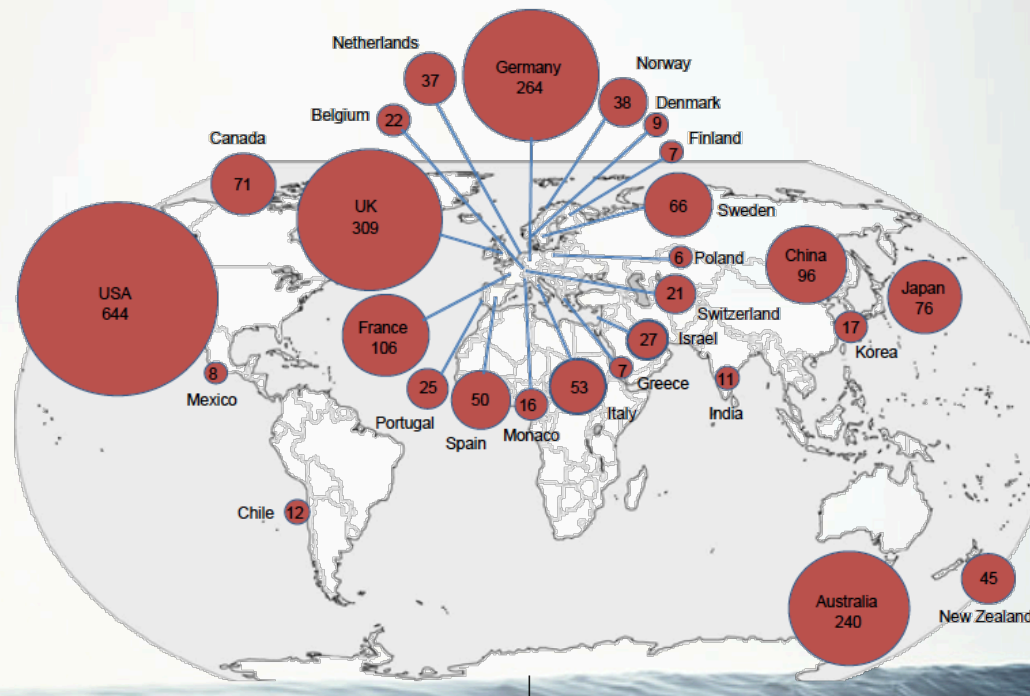


[View Larger Interactive Map](#)

## What do know the rest of the OA community about what is really done in LA?

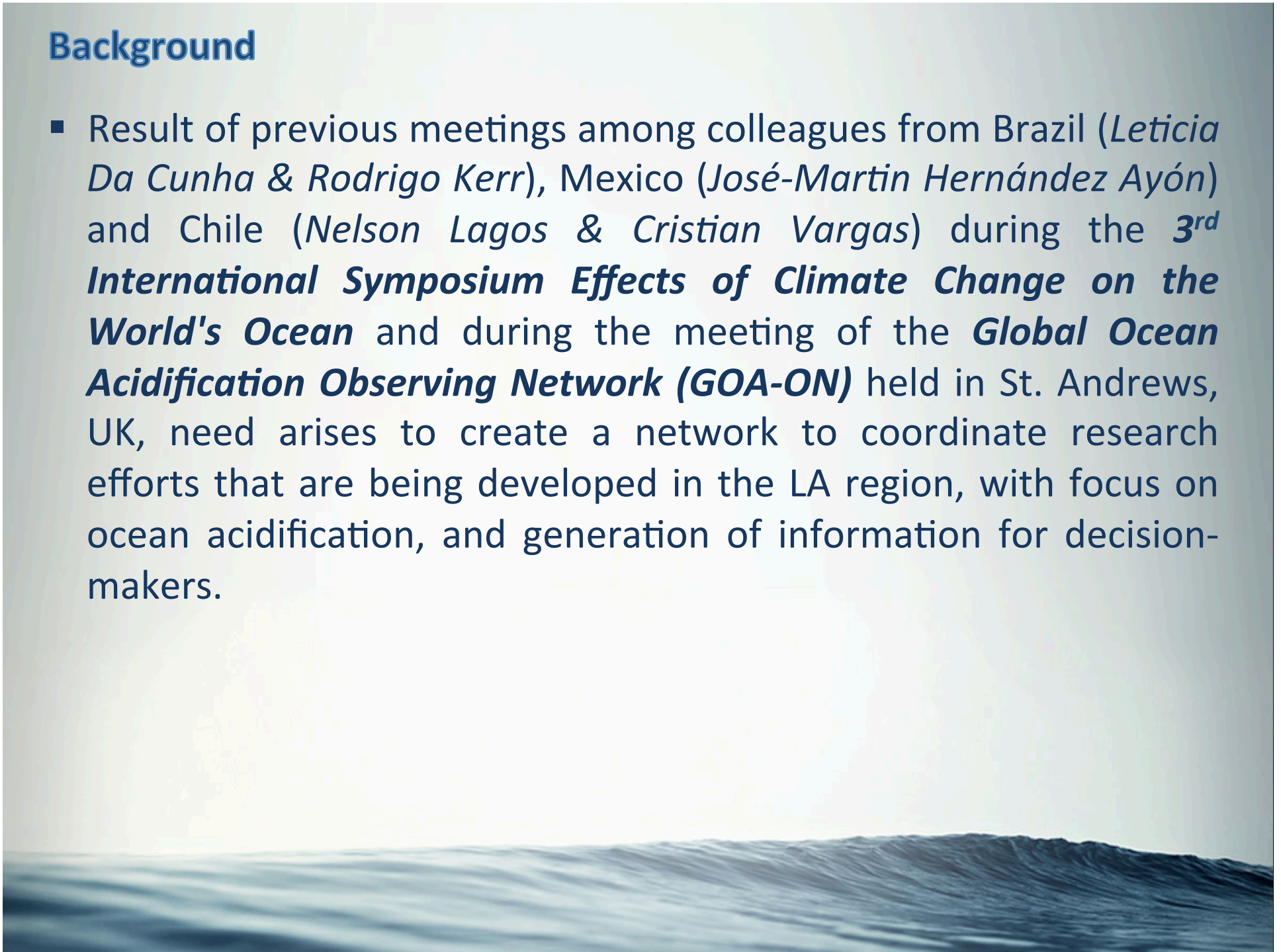
- Only 20 papers in whole the OA community in LatinAmerica, 12 in Chile and 8 in Mexico. What about Brasil, Argentina, Perú, and so on...?
- Is this a lack in the exchange of information with the worldwide community ?

(P. Williamson. Data from the International Atomic Energy Agency (IAEA) Ocean Acidification International Coordination Centre)



## Background

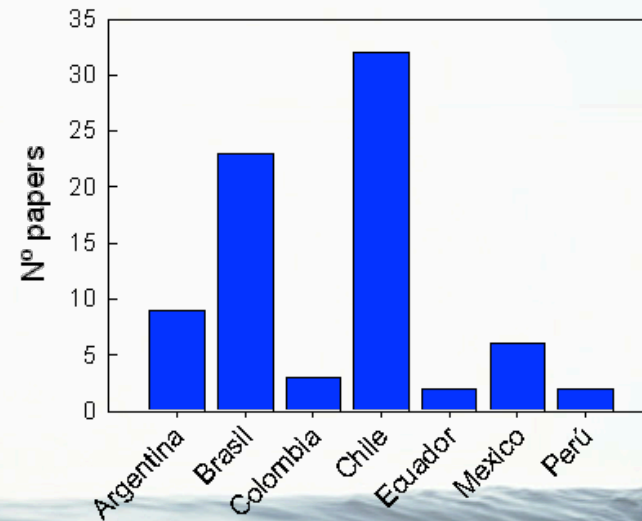
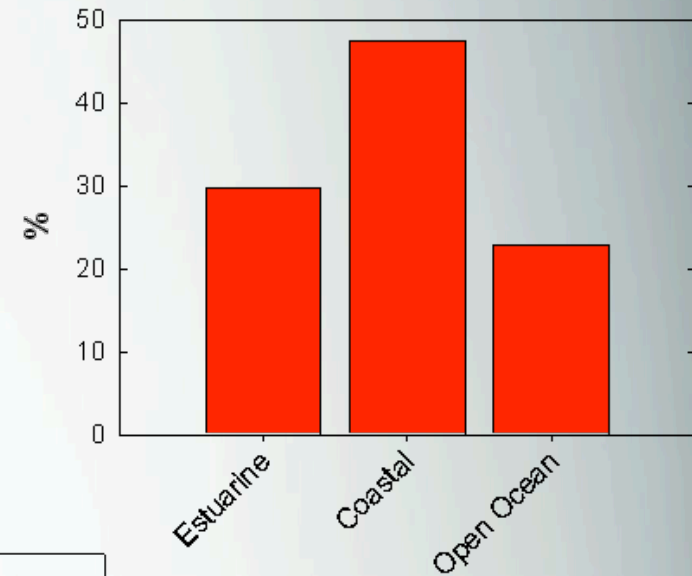
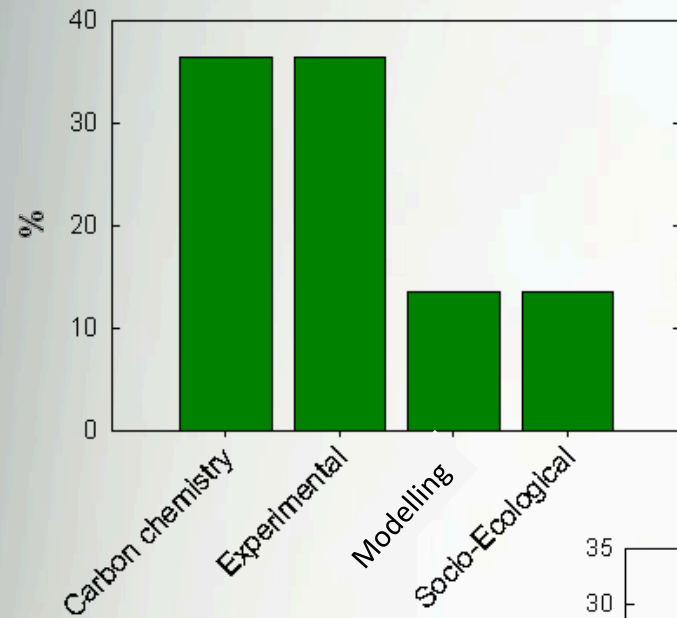
- Result of previous meetings among colleagues from Brazil (*Leticia Da Cunha & Rodrigo Kerr*), Mexico (*José-Martin Hernández Ayón*) and Chile (*Nelson Lagos & Cristian Vargas*) during the **3<sup>rd</sup> International Symposium Effects of Climate Change on the World's Ocean** and during the meeting of the **Global Ocean Acidification Observing Network (GOA-ON)** held in St. Andrews, UK, need arises to create a network to coordinate research efforts that are being developed in the LA region, with focus on ocean acidification, and generation of information for decision-makers.





## The real situation

- **27 formal members...** but 20 scientists agreed, but they still do not sign their affiliation = **47 members**



# The potential for the establishment of LAOCA

- Lines of action includes:
  - (i) the study of the carbonate system in coastal, oceanic and estuarine waters, and its ecological and biogeochemical implications,
  - (ii) modelling and projection of local and regional scenarios of ocean acidification for Latin America based on monitoring at high spatial and temporal resolution,
  - (iii) the experimental evaluation of the biological responses of marine organisms against these scenarios of ocean acidification and its interaction with other climatic and anthropogenic stressors, and
  - (iv) the effect on socio-ecological systems of the participating countries.



# Data base of potential scientists to be incorporated in LAOCA

We are already working in the establishment of a governance plan and basic protocols focused on some requirements to be part of this network, e.g.:

- *Researchers actively working in one of the lines of action in LAOCA (i.e. demonstrated in publications, projects and training students), and*
- *Demonstrate an interest in developing and improving the quality of research on ocean acidification at the regional level, beyond personal interests.*
- *Interest for cooperation and assist those regions with significant research gaps.*

## LISTADO INICIAL GRUPOS DE INVESTIGACIÓN TRABAJANDO EN TEMÁTICAS RELACIONADAS CON ACIDIFICACIÓN DEL OCÉANO EN LATINOAMERICA (Argentina, Brasil, Colombia, Chile, Ecuador, México y Perú)

Hº	Nombre/Name (nome)	Profesión/Profession (profissão)	Institución/Institution (Instituição)	E-mail (e-mail)	Área Investigación/Research Field (Tópicos de Pesquisa)	AO Papers (nº)	País/Country
1	Alejandro BIANCHI	Oceanógrafo Físico Doctor en Oceanografía Física	Servicio de Hidrografía Naval Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires	<a href="mailto:abianchi@hidro.gov.ar">abianchi@hidro.gov.ar</a>	Dinámica Oceánica Ciclo del Carbono	7	ARGENTINA
2	Ana Paula OSIROFF	Oceanógrafa Física	Servicio de Hidrografía Naval	<a href="mailto:aosiroff@hidro.gov.ar">aosiroff@hidro.gov.ar</a>	Dinámica Oceánica Ciclo del Carbono	1	ARGENTINA
3	Lucía C. KAHL	Oceanógrafa Física	Servicio de Hidrografía Naval CONICET	<a href="mailto:ckahl@hidro.gov.ar">ckahl@hidro.gov.ar</a>	Dinámica Oceánica Ciclo del Carbono	--	ARGENTINA
4	Carlos BALESTRINI	Oceanógrafo	Servicio de Hidrografía Naval	<a href="mailto:cfbales@hidro.gov.ar">cfbales@hidro.gov.ar</a>	Modelado físico-biogeoquímico ciclo del carbono y nutrientes, impacto de cambios climáticos	--	ARGENTINA
5	Carla BERGHOFF	Biología, Química	INIDEP	<a href="mailto:carla_berghoff@yahoo.com">carla_berghoff@yahoo.com</a>	Acidificación, ciclo del carbono		ARGENTINA
6	Rodrigo Kerr*	Professor Universitário Biólogo Marinho Doutor em Oceanografia Física, Química e Geológica	Instituto de Oceanografia Universidade Federal do Rio Grande – FURG	<a href="mailto:rodrigokerr@furg.br">rodrigokerr@furg.br</a> <a href="mailto:rodrigokerr@hotmail.com">rodrigokerr@hotmail.com</a> <a href="mailto:broa@furg.br">broa@furg.br</a>	Air-Sea CO <sub>2</sub> net flux (shelf seas and open ocean – Atlantic and Southern Oceans) Anthropogenic Carbon	2 (in prep.)	BRASIL
7	Leticia C. da Cunha*	Professor Universitário Oceanógrafa PhD em Oceanologia – Geoquímica Orgânica	Faculdade de Oceanografia Universidade do Estado do Rio de Janeiro – UERJ	<a href="mailto:lcotrim@uerj.br">lcotrim@uerj.br</a> <a href="mailto:leta_ocn@yahoo.com">leta_ocn@yahoo.com</a>	Air-Sea CO <sub>2</sub> net flux (estuaries, shelf seas and open ocean – Atlantic and Southern Oceans)	1 (in prep.)	BRASIL
8	Ruy K. P. Kikuchi*	Professor Universitário Geólogo Doutor em Geologia	Departamento de Oceanografia Instituto de Geociências Universidade Federal da	<a href="mailto:kikuchi@ufba.br">kikuchi@ufba.br</a> <a href="mailto:ruykenji@gmail.com">ruykenji@gmail.com</a>	OA Experiments – Corals and sediment OA Proxies	1 (in prep.)	BRASIL



## LAOCA comes true !!!!

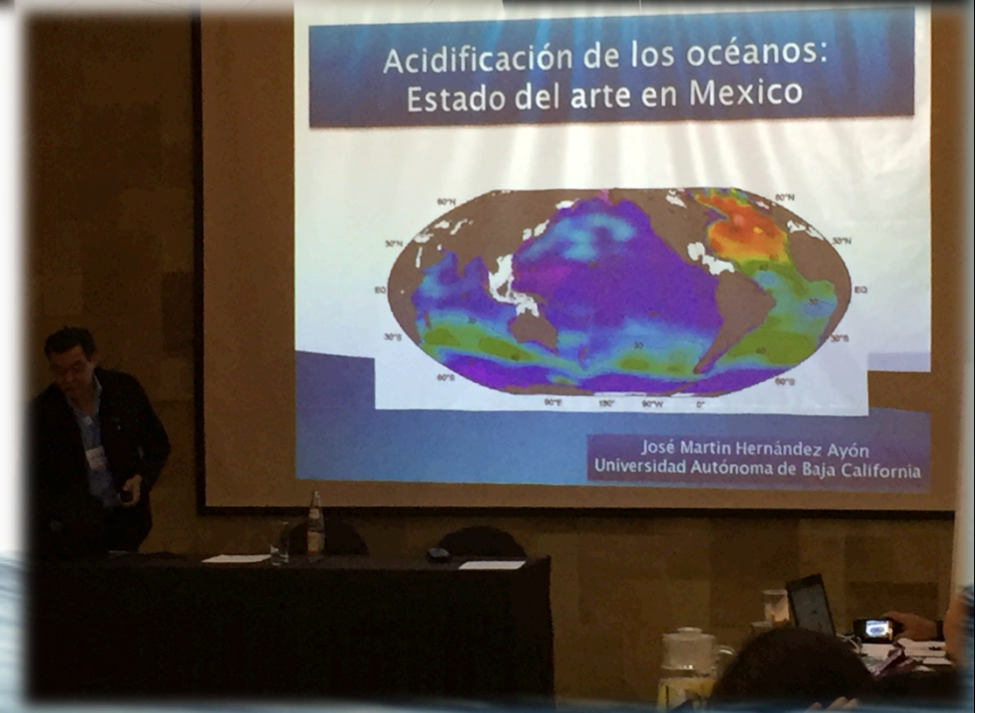
- *This December 15th, 2015, in the city of Concepcion, Chile, it was officially established the Latin-American Ocean Acidification Network (LAOCA Network).*
- *A group of 24 scientists from seven Latin-American countries, including two representatives from; **Argentina, Brazil, Colombia, Ecuador, Peru, Mexico, and Chile**, worked all together on a regional workshop, which was funded by Chilean research centers, Centre for the Study of Multiple-Drivers on Marine Socio-Ecological Systems (MUSELS), and the Millennium Institute of Oceanography (IMO) in Chile, and the Intergovernmental Oceanographic Commission IOC-UNESCO, OA-ICC.*







- *During this meeting we have analysing the “state of the art” regarding our knowledge about carbon chemistry and the impact of ocean acidification on different biological/ecological models.*



# Actual capacities for carbonate system observation in coastal and open ocean. What is good enough?

COUNTRY	COLOMBIA	ARGENTINA	BRASIL	MEXICO	ECUADOR	PERU	CHILE
<b>EQUIPMENTS</b>							
pH	X	X	X	X		X	X
Alkalinity	X	X	X	X		X	X
DIC		X		X			X
pCO <sub>2</sub>	X	X	X	X			
Reference Material	Yes	Yes	Yes	Yes		Yes	Yes
Buoys/time-series/ cruises	X (pCO <sub>2</sub> )	X	X X	X X		X	X X
Data quality	Not- implemented	Weather (pH) Climate (pCO <sub>2</sub> , alkalinity)	Weather (pH) Climate (pCO <sub>2</sub> , alkalinity)	Weather (pH) Climate (Alkalinity)		Weather	Weather (pH) Climate (Alkalinity)
Capacities	Lack of capacitation	Lack of capacitation	Lack of capacitation	Lack of capacitation	No-scientists working in carbon chemistry	Human resources Lack of capacitation	Human resources Lack of capacitation



- We have defined a common criteria for LAOCA' members, which is **to share and make available “protocols” and “data”, including all information on ocean chemistry after two years of collecting the data, and in the same way, we will make available the data generated by experiments with local species. This information will be available through PANGEA. Data from buoys and sensors will be free to use, from the respective websites of observation programs.**



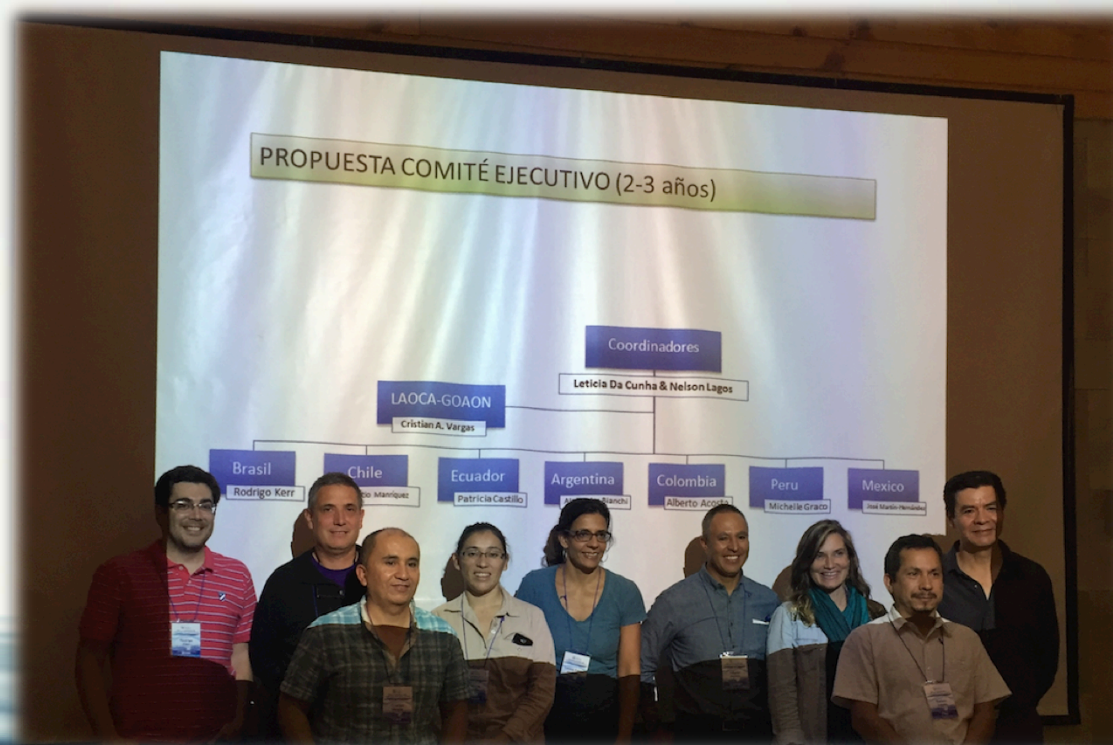
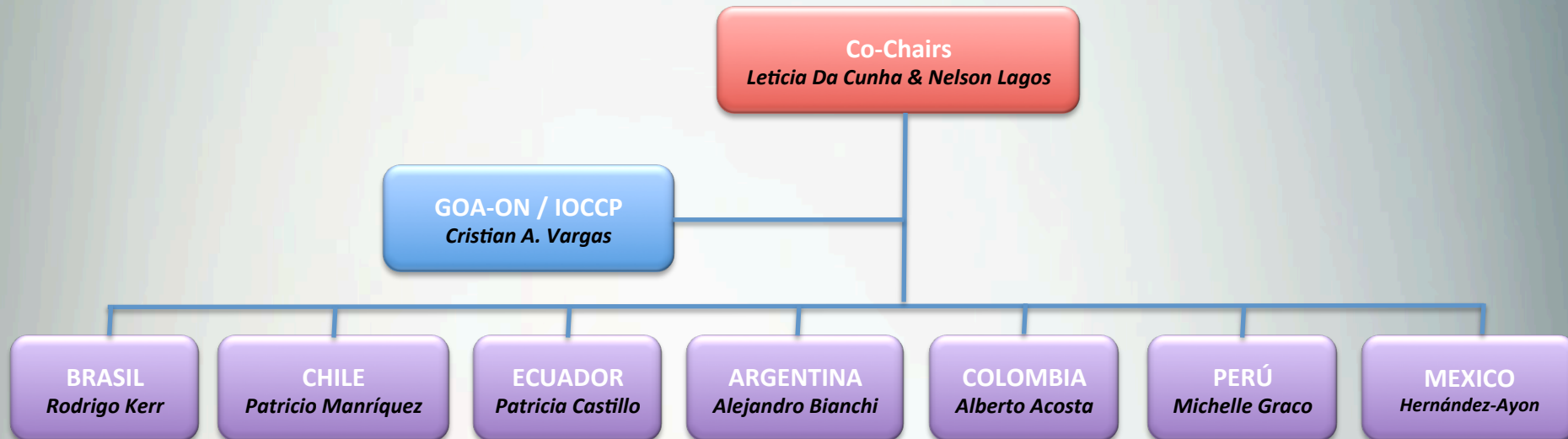


- *Along with this analysis it was defined the mission and goals of LAOCA Network, including ten main objectives;*
  - (i) to synthesize the information about ocean acidification impacts in Latin-American,*
  - (ii) to encourage the implementation, maintenance, and calibration of long-term data-set of carbonate chemistry in Latin-America,*
  - (iii) training of LAOCA members in the different action lines (e.g. observation, experimentation, and modelling),*
  - (iv) to standardize chemical analytical techniques and protocols for experimentation in order to enhance data quality,*
  - (v) to establish a regional node for the articulation and communication between local, regional, and global research programs (e.g. GOA-ON and IOCCP),*
  - (vi) to determine and evaluate local and regional scenarios of Ocean Acidification for different types of marine ecosystems (e.g. estuaries, coastal area, open ocean, etc),*
  - (vii) to enhance student exchange and to facilitate access to infrastructure and equipment among institutions and LAOCA member countries,*
  - (viii) to design an outreach strategy for communicate the problematic of ocean acidification to society,*
  - (ix) to promote the development of cooperation projects between member countries of LAOCA, and*
  - (x) to promote the inclusion of the problematic of Ocean Acidification on the political agenda of member countries, and even through the pursuit of cooperation agreements among LAOCA members.*





# Executive Council LAOCA 2016 - 2018



## LAOCA Agenda 2016: Needs and opportunities

- **1<sup>st</sup> Executive Council Meeting:** Lima, Perú, 9-10 June 2016.
- **Training:** Training Course for technician and lab managers on carbonate system measurements, incl. sampling, preservation, analysis, protocols, calibration of sensors, use of reference material. December 2016.
- **Intercalibration exercises:** Intercalibration among different LA laboratories (AT and DIC) and foreign Labs (GOA-ON?). March 2017.
- **Outreach:** We are organizing the “1<sup>st</sup> LAOCA Symposium” for April 2017, including all the OA community from Latin-American countries.
- **Publication:** A paper/review regarding biological responses of marine organisms upon OA in coastal and open ocean for Latin-American countries will be written during 2016/2017.
- **Funding:** Application to national and international calls for funding networking, focused on the establishment of an observing system. At this initial stage we will focus in those countries with a significant research gap about carbonate chemistry and biological responses, e.g. Ecuador (Galapagos Island), Colombia (Caribbean island), Chile (Eastern Island), etc. A pre-proposal was already submitted (*PI: Dr. Cristian A. Vargas & Nelson Lagos*).

## What about our regional needs?

- *Difficult to assess if we don't consider LAOCA' priorities and our collaborative purpose...*



- *There're some specific/regional research gaps and geographic areas, which needs to be considered as priorities (e.g. oceanic islands, Ecuador, Colombia, etc)... and we need to push up all together as a LA community !!!*



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# LAOCA Agenda 2016: Needs and opportunities



## **LATIN AMERICAN OCEAN ACIDIFICATION NETWORK REQUIREMENTS AND GOVERNANCE PLAN**

1<sup>st</sup> Workshop of the LAOCA NETWORK

Argentina, Brasil, Chile, Colombia, Ecuador, Mexico and Peru

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latin american  
ocean acidification  
network

LAOCA