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UNVEILING THE OCEAN-CLIMATE NEXUS IN LATIN AMERICAN NDCS

Desvendando o nexo oceano-clima nas NDCs da América Latina

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ABSTRACT

This article examines the presence and relevance of the ocean in the Nationally Determined Contributions (NDCs) of Latin American (LATAM) countries. The primary objective is to highlight the ocean-climate nexus and the significance of the blue agenda in global climate policy (topics that remain marginalized in IR literature). The methodology is hybrid, combining literature review and analysis of governmental documents. The study focuses on Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela. The temporal scope of the analyzed NDCs spans from 2015 to 2024. Data sources include the IPCC report on the ocean and various versions of the UNFCCC NDCs for the mentioned countries, in addition to recent guidelines on blue carbon and nature-based solutions (NbS) in NDCs. Results indicate that LATAM countries do not yet acknowledge the ocean as a critical component for achieving regional sustainable development or as a key driver for climate action.

Keywords: Ocean. Climate change. Latin America.

RESUMO

Este artigo analisa a presença e relevância do oceano nas Contribuições Nacionalmente Determinadas (NDCs) dos países da América Latina (LATAM). O objetivo principal é destacar o nexo oceano-clima e a importância da agenda azul na política climática global (temas marginalizados na literatura das RI. A metodologia é híbrida, combinando revisão da literatura e análise de documentos oficiais. O recorte especial considera Argentina, Brasil, Chile, Colômbia, Equador, México, Peru, Uruguai e Venezuela. O recorte temporal das NDCs abrange o período 2015-2022. As fontes de dados incluem o relatório do IPCC sobre oceano e as diferentes versões das NDCs da UNFCCC para os países mencionados, além de diretrizes recentes sobre carbono azul e soluções baseadas na natureza (NbS) em NDCs. Os resultados indicam que os países da LATAM ainda não reconhecem o oceano como um componente importante para promover o desenvolvimento sustentável regional ou como um vetor chave para a ação climática.

Palavras-chave: Oceano. Mudança climática. América Latina.

INTRODUCTION

Although international relations (IR) have traditionally focused on geopolitical and economic issues, it has recently been faced with new challenges. Some of these are imposed by climate change, which transcends national land borders and requires unprecedented international and cross-sectoral cooperation. In this context, the ocean emerges as a critical piece. This is particularly relevant as the international community prepares for the 2025 cycle of Nationally Determined Contributions (NDCs), a crucial opportunity to scale up global

emissions reductions and strengthen resilience by integrating Nature-based Solutions (NbS) more prominently (Nature4Climate Coalition, 2024; Von Unger *et al.,* 2020).

The ocean indeed plays a vital role in regulating the climate (IPCC, 2019), absorbing much of the carbon dioxide (CO_2) and heat generated by anthropogenic activities. However, the ongoing degradation of marine ecosystems, exacerbated by acidification, sea level rise (SLR), and loss of biodiversity, jeopardizes global environmental, climate, and socio-economic stability. This calls for an urgent and strategic incorporation of the ocean into the global climate agenda. Besides, the concept of 'blue carbon' ecosystems (mangroves, seagrasses, and tidal marshes) as highly efficient natural carbon sinks is gaining traction, offering significant potential for climate mitigation and adaptation (Blue Carbon Initiative, 2023; Conservation International *et al.,* 2023).

Recently, some progress has been made in this area. In 2015, the 2030 Agenda provided a comprehensive framework to support the promotion of sustainable development (UN, 2015), including the ocean. Through its 17 Sustainable Development Goals (SDGs), the 2030 Agenda promotes an intersectoral and collaborative approach to tackling global challenges. Although SDG 14 is the one most directly related to the ocean, at the interface with the climate agenda, there is a connection with at least the following SDGs (Santos, 2023): (i) SDG 13, which promotes actions to combat climate change and its impacts; (ii) SDG 17, which promotes partnerships to achieve the goals of the 2030 Agenda, enhancing international cooperation through the mobilization of financial resources, the transfer of technology, and the strengthening of capacities to face ocean challenges; and (iii) SDG 9, which encourages innovation and scientific research, boosting the development of new technologies and approaches for ocean conservation and mitigating the impacts of climate change.

The Paris Agreement represents a historic milestone in global efforts to combat climate change and seeks to remove the main barriers to international climate cooperation (Falkner, 2016). Adopted in 2015 during the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), it seeks to establish a framework for collective action to mitigate anthropogenic greenhouse gas (GHG) emissions, adapt to climate impacts, and strengthen global resilience. Among its instruments there are NDCs, which are climate commitments that each signatory country voluntarily establishes, detailing its goals for mitigating and adapting to climate change. Indeed, the 'ratchet mechanism' of the Paris Agreement encourages countries to submit progressively ambitious commitments, making the upcoming NDC updates a critical juncture for climate action (Blue Carbon Initiative, 2023).

The NDCs traditionally focus on sectors such as energy, transport, and agriculture, yet there is a recent and growing shift towards including specific actions aimed at the ocean. Examples of this trend include protecting marine ecosystems and supporting sustainable fisheries as measures to achieve climate goals. Established as a collaborative platform to

discuss progress on the Paris Agreement, the Talanoa Dialogue has also brought to light the need to consider ocean impacts in climate discussions, promoting greater awareness among member states. Initiatives like 'The Blue NDC Challenge' are actively encouraging countries to incorporate ocean-based measures into their NDCs, covering areas such as marine conservation, aquatic food, offshore renewable energy, shipping, and coastal tourism (Laura, 2023).

On a regional level, Latin American (LATAM) countries are becoming more active in international forums that address the intersection between the ocean and climate change (Brasil, 2025). Chile, for example, co-hosted the “Our Ocean” Conference in 2015. In addition, Central American and Caribbean countries are pushing for greater inclusion of ocean-related issues in discussions on loss and damage within the Paris Agreement.

Taking this agenda into account at the global level and recognizing this particularity at the regional level, this article seeks to answer the following question: do LATAM countries consider the ocean in their climate plans? In the context of this article, we consider LATAM to be the countries of South America plus Mexico. Bolivia and Paraguay will not be included as they are landlocked insular countries. Following ECLAC’s definition of the regions, we have excluded the Central American Isthmus and the Caribbean Region.

The article’s methodology mixes different approaches. The nature is qualitative, combining a literature review and document analysis. Section 2 provides a brief review of the literature on concepts and definitions related to the issue, tying international relations, climate change, and ocean. Next, section 3 presents the methodology in detail, showing the origin of the data from the LATAM countries. It also presents the criteria used to select the countries analyzed and the analytical framework for the various analyzed versions of the nationally determined contributions (NDCs). Section 4 then presents the discussions and results based on scientific articles, documents, and current policies, assessing the role of the marine and maritime sectors in climate change policies. Finally, we make some conclusions and recommendations, highlighting some challenges and proposing future studies to promote the agenda in the region.

LITERATURE REVIEW

It is not surprising that international relations (IR) have not traditionally prioritized environmental and climate issues (Pereira, 2017). A proxy for easily identifying and broadly ratifying this argument is the rare inclusion of these discussions in undergraduate and postgraduate curricula in the field, which is reflected in the scarcity of quality publications on the subject. Along this vein, IR often neglect the blue agenda and ocean governance, treating them as a secondary issue in relation to climate negotiations (Bueger and Mallin, 2023; de Carvalho and Leira, 2022). Thus, IR teaching and research end up reproducing the marginalization of the environmental, climate, and ocean agendas.

The ocean is usually examined from a security perspective (Beirão, 2017; Medeiros and Moreira, 2017; Vreÿ, 2017). In some cases, climate politics is associated with the crisis of the liberal international order (Albuquerque, 2021). In the context of Latin America (LATAM), studies focus on the geopolitics of water resources (Fuccille, Bragatti, and Leite, 2017) and energy resources (Santos, 2021; Lara, 2012), often focusing on the South Atlantic from the perspective of security communities (Violante, Marroni, and Cabral, 2020) and Brazilian influence (Brigagão and Seabra, 2011), including on the environmental and climate agenda (Santos and Santos, 2021; Ribeiro and Inoue, 2019).

Just like any other strategically significant natural landscape, the climate and the ocean indeed interfere with the dynamics of international politics in different established aspects, such as geopolitics, international security, regional cooperation, and diplomacy. As an illustrative example, ocean acidification affects marine biodiversity and fishing industries, impacting coastal economies and generating geopolitical tensions, reshaping power dynamics, opening new fields of interest, and pushing technological frontiers ever further. Rising sea levels and the loss of coastal habitats pose threats to national and international security, leading to possible conflicts over resources.

Indeed, the nature of the climate and ocean agenda does not follow state-centric foundations limited to national land borders, which calls for the strengthening of regional cooperation. Consequently, climate and ocean have emerged as central elements in diplomacy, with small island developing states (SIDS), such as Fiji and Seychelles, leading efforts for more than two decades to include marine spaces in different international climate mitigation and adaptation agreements.

There is no longer any doubt that "the ocean plays a central role in climate change mitigation and adaptation" (Dobush *et al.,* 2022, p.254). However, climate and ocean have mutual impacts. In the words of Hoegh-Guldberg *et al.* (2019, p.1372), "the ocean is not simply a victim of climate change, but a powerful source of solutions". On the one hand, global warming is already affecting the ocean through rising sea levels, acidification, and loss of biodiversity. On the other hand, the ocean is fundamental in regulating the global climate by absorbing carbon dioxide (CO_2), controlling the global average temperature, and mitigating climate change. To deal with this complex, bidirectional, and growing correlation, ocean governance plays a key role in addressing these challenges and proposing efficient and effective responses to change the course of the global climate trajectory.

Recent years have witnessed a global effort to integrate the ocean into international politics. The growing role of organizations such as the United Nations Convention on the Law of the Sea (UNCLOS), the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO), the 2030 Agenda (2016-2030), the Decade of the Ocean (2021-2030), the United Nations Ocean Conference (UNOC), and the recent advances of The United Nations agreement on Biodiversity Beyond National Jurisdiction

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(BBNJ Agreement) stand out. Particularly regarding the global climate agenda, although there are some sector-specific initiatives, such as MARPOL addressing emissions associated with maritime transport, climate negotiations, such as the Conferences of the Parties (COPs), have traditionally focused on land-based and atmospheric emissions, ignoring the crucial intersection with the ocean. This is also echoed in the Paris Agreement itself.

> "Yet the Parties to the Agreement have largely overlooked the effect of climate change on ocean-based communities, economies, and ecosystems —as well as the role that the ocean can play in mitigating and adapting to climate change. Because the ocean is an integral part of the climate system, stronger inclusion of ocean issues is critical to achieving the Agreement's goals" (Cooley *et al.,* 2019, p.1).

However, the Nationally Determined Contributions (NDCs) have changed this trend, progressively including coastal spaces, maritime activities, marine and ocean resources in their efforts to tackle the ongoing climate threat. Among the initiatives, some countries have begun to include ocean-based solutions in their NDCs, contemplating the restoration of coastal ecosystems, such as mangroves and coral reefs, which act as important carbon sinks (Khan, Northrop, and Schindler Murray, 2022). These actions not only capture CO_2, but also provide coastal protection and sustain marine biodiversity. In addition, countries with long coastlines and SIDS are integrating ocean-related adaptation measures into their NDCs, including developing climate-resilient infrastructure, implementing integrated coastal zone management policies, and empowering local communities to deal with the impacts of rising sea levels, more intense storms and ocean acidification.

There are different instruments, ranging from blue bonds and climate-smart investment mechanisms to marine spatial planning (MSP) and ecosystem-based management (EBM) approaches, that are capable of catalyzing transformative shifts in ocean governance and ocean-based climate solutions. As presented by the 2030 Agenda and the Ocean Decade, support from more developed countries, research, development and innovation (RD&I), international cooperation, and knowledge and technology transfer are necessary (IOC-UNESCO, 2021).

Therefore, following OECD (2025), there is a need to direct international climate finance towards ocean protection and restoration as a way of contributing to global climate adaptation and resilience. In addition, the loss and damage mechanism, provided for in the Paris Agreement, could be expanded to include the impacts of climate change on the ocean, such as sea level rise and coral bleaching.

Fiji and Seychelles, for example, were pioneers in including ocean actions in their NDCs. These countries are protagonists and highlight the importance of the ocean for their economies and ecosystems, pushing for greater inclusion of ocean targets in future revisions of the NDCs. Meetings such as the United Nations Ocean Conference (UNOC), for example UNOC1 (2017, New York/USA), UNOC2 (2022, Lisbon/Portugal), Ocean Decade Conference

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(2024, Barcelona/Spain) and the next UNOC3 (2025, Nice/France) evidence the key role of these countries, as well as the growing relevance of related themes such as blue economy, ocean literacy, blue justice, and ocean-climate nexus on the global agenda.

Talanoa Dialogue, an effort initiated in 2018 during COP23 under Fiji's leadership, has promoted greater understanding of the ocean in the context of climate change. The forum aimed to offer an inclusive and participatory platform for governments and other stakeholders to share experiences and solutions for implementing the Paris Agreement. However, it has broadened its focus on the ocean by emphasizing the vulnerability of SIDS, which are at the forefront of the effects of climate change. The Talanoa Dialogue has helped bring the ocean to the forefront of climate discussions (Dobush *et al.,* 2022), educating world leaders on the importance of protecting it as an essential component of global response to climate change. This increased awareness has prompted the inclusion of ocean-related goals in future NDCs and climate finance.

Despite the global nature of the climate and ocean agenda, actions and policies must be developed locally and regionally. Latin America (LATAM) is widely renowned for its port and shipping activity in the Panama Canal, the abundance of marine and coastal tourism in the Caribbean, and the cultural, spiritual, and religious significance of local areas and species. The next section will explain the selection method for the countries included in this article, as well as the documents analyzed.

METHODOLOGY

This section presents how the research will be carried out to answer the question posed in the introduction. After the literature review on the intersection between IR, climate, and ocean, which are basic concepts for understanding this article, it will briefly present the countries analyzed linking their NDCs to the ocean-climate nexus.

Following Santos (2025), we meticulously delineate our scope by focusing on a select group of nine Latin American nations: Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela. This precise geographical confinement is not arbitrary; rather, it reflects a deliberate methodological choice aligned with the regional classification put forth by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC). A key aspect of this selection is the intentional exclusion of landlocked countries, specifically Bolivia and Paraguay, given their inherent lack of direct access to marine environments and, consequently, their differing policy priorities concerning ocean-climate interactions. Furthermore, the study opts to bypass the Central American Isthmus and the broader Caribbean region, acknowledging that these areas present distinct socioeconomic, political, and maritime governance landscapes that would introduce significant analytical heterogeneity, thus preserving the sharp focus of the inquiry. This carefully curated

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geographical boundary is fundamental to precisely examining the intricate interplay between ocean resources and climate policy within a comparable regional context.

Beyond establishing a consistent regional boundary, the choice of these nine countries is further substantiated by several factors that collectively enrich the depth and insights of the research. These nations collectively embody a substantial regional importance, playing a critical role in global biodiversity conservation, climate regulation, and a diverse array of ocean-based economic activities, ranging from port and shipping traffic to vibrant coastal tourism and the exploitation of offshore resources. Crucially, the selected countries generally possess more advanced MSP and blue economy agendas compared to others in the broader region, offering a fertile ground for scrutinizing policy integration and implementation effectiveness. The accessibility of reliable official data and governmental documents pertaining to these specific countries was also a pivotal criterion, enabling the robust document analysis and literature review that form the backbone of the study. Moreover, the chosen group exhibits a remarkable geographical diversity, particularly in terms of land area, the size of their Exclusive Economic Zones (EEZs), and the ratio of EEZ to land area. This variability inherently shapes national policy emphasis; for instance, countries such as Chile and Ecuador, with marine territories nearly five times their landmass, demonstrate a pronounced imperative for ocean-centric policies, whereas larger countries like Brazil and Argentina, despite their extensive coastlines, sometimes display a more nascent blue economy agenda due to their lower EEZ-to-land ratios. This multifaceted composition allows for invaluable comparative insights into how ocean-related issues are integrated into national climate policies and NDCs across varying national circumstances (Santos, 2025).

Argentina is the second largest country in South America in terms of territory and the third in terms of population, located between the Andes Mountains range and the Atlantic Ocean. It has a very high Human Development Index (HDI) and one of the highest GDPs per capita in the region. Brazil is the largest country in Latin America, the fifth largest in the world in terms of land area, and the only country in the Americas where Portuguese is mostly spoken. It borders all the other South American countries except Chile and Ecuador and is in the top 10 GDPs in the world. Chile occupies a long, narrow strip of coastline wedged between the Andes Mountains range and the ocean, bordering Peru, Bolivia, and Argentina. Its unusual territory has a very varied climate, ranging from the driest desert in the world (the Atacama Desert) in the north of the country to a snow-prone alpine in the south. It has one of the highest HDIs in LATAM.

Colombia shares land borders with Venezuela, Brazil, Ecuador, Peru, and Panama, as well as maritime borders with Jamaica, Haiti, the Dominican Republic, Honduras, Nicaragua, and Costa Rica. It is the second largest country in South America and is dominated by the Andes mountains. Ecuador shares borders with Colombia and Peru. As one of the smallest countries in South America, it also has the Galapagos Islands about 1,000 km from the mainland. Mexico

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borders the United States of America (USA), Guatemala and Belize. In pre-Columbian Mesoamerica, before European influence, many cultures matured into advanced civilizations such as the Maya.

Peru borders Ecuador, Colombia, Brazil, Bolivia, and Chile. Like Chile and Colombia, it is bathed by the Pacific Ocean. Its geography is varied, displaying arid plains, snow-capped peaks, and the Amazon rainforest, providing diverse natural resources. Peruvian territory was home to the Inca Empire, considered the largest state in pre-Columbian America, and is currently heavily dependent on mining. Uruguay's only land border is with Brazil, as the Uruguay River separates it from Argentina. It is the second smallest country in South America, only bigger than Suriname, and one of the most economically developed countries in South America, with one of the highest GDPs per capita in the region. Finally, Venezuela is made up of a continental part and many small islands in the Caribbean Sea. It shares land borders with Colombia, Brazil, and Guyana and maritime borders with thirteen states, such as Trinidad and Tobago, Grenada, Saint Vincent and the Grenadines, Saint Lucia, and Barbados. It is an oil-rich country and in recent years the country has faced a serious socio-economic and political crisis, with hyperinflation and shortages of basic products.

This research distinguishes itself by conducting a novel, in-depth analysis of the most recent NDCs, offering a timely and critical perspective on the evolving ocean-climate nexus in Latin America. By focusing exclusively on the provided updated official documents, this study ensures a rigorous and grounded assessment, avoiding the dilution of its findings with outdated or irrelevant information. This innovative approach not only fills a significant gap in the existing literature but also provides crucial insights for policymakers and scholars, highlighting the urgency and importance of the blue agenda in achieving the Paris Agreement goals.

Table 1 summarizes some of the region's geographical, social, and economic indicators for the nine countries analyzed. This article focuses on LATAM, which encompasses eight South American countries plus Mexico.

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Table 1- Overview of selected geographical, social, and economic indicators (2022)

Country	Land area (1)	EEZ[1] (200NM) (km^2) (2)	(2)/(1)	Marine protected areas (% of territorial waters)	Population	GDP (current US$)[2]	Unemployment, total (% of total)[3]	Inflation (annual %)[4]
Argentina	2,736,690	1,159,063	42.4%	11.8	46,234.83	632,770.28	8.7**	94.8
Brazil	8,358,140	3,830,955	45.8%	26.8	215,313.50	1,920,095.56	9.2	9.3
Chile	743,532	3,681,989	495.2%	41.4	19,603.73	301,025.25	8.3	11.6
Colombia	1,109,500	808,158	72.8%	17.1	51,874.02	343,939.45	10.6	10.2
Ecuador	248,360	1,077,231	433.7%	19.1	18,001.00	115,049.48	4.5**	3.5
Mexico	1,943,950	3,269,386	168.2%	21.6	127,504.13	1,414,187.19	3.3	7.9
Peru	1,280,000	906,454	70.8%	8.0	34,049.59	242,631.55	5.1**	8.3
Uruguay	175,020	142,166	81.2%	0.7	3,422.79	71,177.15	7.9	9.1
Venezuela	882,050	471,507	53.5%	4.4	28,301.70	482,359.32	7.5*	234.0
LATAM	17,477,242[a]	15,346,909	87.8%	16.8[b]	544,305.29[a]	5.523,235.23[a]	7.2[b]	43.2[b]
LAC	20,038,980			19.4*	659,311.10	6,246,621.76	9.5**	8.3
Total/LAC	87.2%				82.6%	88.4%		
World	129,979,827			13.3*	7,951,149.55	100,562,011.13	6.2**	8.3
Source	FAO (2020)	IILSS (2021)		WDPA (2022)	UNPD (2022)	WB and OECD (2022)	ILO (2022)	IMF (2022)

Source: Santos (2025)2; 1 exclusive economic zone; 2 gross domestic product; 3 national estimates; 4 consumer price; LAC = Latin America and the Caribbean; FAO = Food and Agriculture Organization; IILSS = International Institute for Law of the Sea Studies; WDPA = World Database on Protected Areas; UNPD = United Nations Population Division; WB = World Bank; OECD = Organisation for Economic Co-operation and Development; ILO = International Labour Organization; IMF = International Monetary Fund; * 2020; ** 2021; *** 2016; a sum; b average.

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The selection of the nine countries analyzed considers their relevance in the region (see Table 1). As mentioned in the introduction, the exclusion of Central America and the Caribbean is because the conditions in these islands are very different from those in the countries in question. In addition, it is essential to highlight the availability of reliable official data and documents relating to the policies and commitments to be analyzed below.

This article does not go into further detail about the socio-economic background of the nine countries analyzed, given the particularities of each of them and the focus on the recent blue agenda. However, it is worth noting that these are countries that were colonies of exploitation of European countries that relied heavily on the ocean for the export of their various goods, products, and resources mainly throughout the 16th, 17th, and 18th centuries. Thus, these are economies that from the outset depended on the strength of the naval industry, international transportation, and coastal exploration and development.

In fact, the Spanish and Portuguese Americas developed distinct maritime traditions that reflect their divergent colonial processes. While Portuguese colonization emphasized naval expansion and overseas trade, the Spanish, as noted by Therezinha de Castro, prioritized continental conquest and territorial occupation, resulting in a colonial administration focused more on land than on maritime control. Although a detailed historical analysis falls beyond the scope of this article, it is clear that these geopolitical differences continue to shape contemporary cultural perspectives and undoubtedly influence the maritime and climate policies pursued by these countries today.

Despite this, these are countries that paradoxically do not yet have a maritime situational awareness, an ocean culture, or an ocean literacy that is widely disseminated today. While increasingly prevalent in policy and advocacy and governance circles (IOC-UNESCO, 2022), these concepts remain somewhat amorphous and variably defined within the academic literature, often reflecting normative rather than empirical dimensions. This conceptual vagueness poses challenges for scientific rigor, as the lack of clear, operationalized definitions can render these terms subjective and difficult to systematically assess or compare across contexts

Colonization by the sea has meant that even today, many of these countries have their most developed areas and largest cities on the coast. As resources were exploited and colonization expanded in the centuries mentioned above, there were marches into the interior of these countries, which led to new resources and new activities being developed in the interior of these LATAM countries. Undoubtedly, the lack of awareness of the role of the ocean and coastal activities in LATAM has made it difficult so far to find specific policies aimed at the blue agenda.

Answering the guiding question presented in the introduction, next section will analyze the updated versions of the nationally determined contributions (NDCs), based on the official

documents available on the UNFCCC NDC registry (Table 2 and Figure 1). Following Article 4, paragraph 12 of the Paris Agreement, NDCs communicated by Parties shall be recorded in a public registry maintained by the secretariat. Searches will be carried out using the following keywords: marine, maritime, ocean, coastal, blue, marine spatial planning (MSP), offshore, and sea, in English, Portuguese, and Spanish, excluding repeated mentions in the executive summary and the bibliographical references.

Table 2 - NDCs of LATAM countries

Country	Language	Version	Status	Submission date*	Number of pages
Argentina	Spanish	3	Active	02/11/2021	18
Brazil	English	4	Active	13/11/2024	43
Chile	Spanish and English	2	Active	09/04/2020	9
Colombia	Spanish	2	Active	30/12/2020	112
Ecuador	Spanish	1	Active	29/03/2019	44
Mexico	Spanish	3	Active	17/11/2022	45
Peru	Spanish	2	Active	18/12/2020	17
Uruguay	Spanish	3	Active	30/12/2024	75
Venezuela	Spanish	2	Active	09/11/2021	162

Source: Author, based on https://unfccc.int/NDCREG; * updated versions.

Summing up the methodological arrangement, to analyze the ocean-climate nexus, the analysis mixes literature review, the IPCC report on the ocean, and the different versions of the UNFCCC NDCs of the countries mentioned.

RESULTS AND DISCUSSIONS

Regardless of the variable, the asymmetry between the data presented is striking. In terms of land area, the largest country in the region (Brazil) has almost fifty times the territory of the smallest country in the region (Uruguay). Although Brazil is more than ten times larger than Chile, its EEZs are similar in size. Together with Mexico's EEZ, they are on average three times larger than the largest EEZs in the region (Argentina, Ecuador, Peru, and Colombia). In terms of the EEZ/land area ratio, Chile and Ecuador stand out with their marine territories almost five times larger than their land area, which reinforces the need for policies to promote the blue economy in the region. Despite being the largest countries in the region in terms of land area, Brazil and Argentina have the lowest EEZ/land area ratios, which may be one of the reasons why the blue economy agenda is so recent and still incipient in both countries.

In terms of marine protected areas (MPA) as a percentage of territorial waters, Chile stands out. Peru, Venezuela, and Uruguay have the lowest percentages of marine protected areas. At the

Lisbon Ocean Conference (June 2022), the Minister of the Environment of Uruguay, Adrián Peña, stated that the country decided to increase its MPA from the current 0.7% to 10% by the end of 2022 and assured that a "road map" called "Blue Uruguay 2030" will be implemented to reach the goal of 30% by 2030 in an MSP process (Uruguay, 2022). The updated NDC of Uruguay (December 2024) further solidifies this commitment, emphasizing the nation's comprehensive strategy for climate action, with a strong focus on adaptation and mitigation measures that inherently involve coastal and marine ecosystems. Uruguay's proactive stance, as evidenced by its third NDC submission, demonstrates a clear trajectory towards integrating ocean-based solutions into its national climate policy, setting a precedent for other nations in the region.

Although slightly lower, the average for Latin American countries (16.8%) is very similar to that of LAC (19.4%). The macroeconomic variables presented (GDP, unemployment, and inflation) show that the countries of the region have room for improvement in the performance of economic policies. Latin America's GDP is almost 90% of LAC's GDP but will only account for 5.5% of global GDP in 2022. Average unemployment in 2022 in the region is 7.2%, slightly higher than the world average (6.2%). No doubt promoting blue economy activities and sectors would help these indicators.

THE OCEAN-CLIMATE NEXUS

In the current movement to advance blue economy policies around the world, it is essential to consider their interface with environmental and climate issues. Narrower readings such as maritime economics and marine economy often tend to have a sectoral bias toward ocean-based industries. Only a few broader ocean economy approaches tend to consider marine ecosystem services and the blue economy some ocean economy actors, policies, agreements, and institutions.

In the words of The United Nations Framework Convention on Climate Change (UNFCCC),

> "the ocean is a fundamental part of the climate system and the global response to climate change. The global ocean covers 71% of the surface of our blue planet. It has long taken the brunt of the impact of human-made global heating. It has absorbed about 90% of the heat generated by rising greenhouse gas emissions trapped in the Earth's system and taken in about 25% of carbon emissions, causing devastating impacts and increasing risks on ocean and coastal life and coastal communities' lives and livelihoods."

This makes it clear that in the 21st century, given the framework of the 2030 Agenda, the Paris Agreement, and the latest meetings of the Conference of the Parties (COPs), we need to address the ocean-climate nexus in blue growth policies.

In the Convention Parties, the UNFCCC agreed to protect the climate system (Article 2), defined as the totality of the atmosphere. In the Paris Agreement, Parties noted the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity. More recently, during COP 25 (Chile, 2019), governments recognized for the first time the urgent

need to strengthen the understanding of, and action on, ocean and climate change under the UNFCCC.

According to IPCC (2019), "since 1993, the rate of ocean warming has more than doubled (likely). Marine heatwaves have very likely doubled in frequency since 1982 and are increasing in intensity (very high confidence)." When it comes to impacts on people and ecosystem services, a diversity of responses has been implemented worldwide, mostly after extreme events, but also some in anticipation of future sea level rise, e.g., in the case of large infrastructure. Overall, costs and benefits have been unequally distributed across populations and regions. This is particularly relevant for developing countries of LATAM. Adaptation efforts have benefited from the inclusion of indigenous knowledge and local knowledge.

Regarding LATAM countries, the report stresses that "marine heatwaves (very high confidence) and extreme El Niño and La Niña events (medium confidence) are projected to become more frequent." Besides, (i) the Atlantic Meridional Overturning Circulation (AMOC) is projected to weaken (very likely), affecting regional climatologic dynamics; and (ii) long-term loss and degradation of marine ecosystems compromise the ocean's role in cultural, recreational, and intrinsic values important for human identity and well-being (medium confidence). Directly connected with ocean-based industries, the IPCC (2019) highlights that changes in floods, avalanches, landslides, and ground destabilization are projected to increase risk for infrastructure, cultural, tourism, and recreational assets (medium confidence).

When it comes to responses connected to the ocean-climate nexus, the report states that "all types of options, including protection, accommodation, ecosystem-based adaptation, coastal advance, and retreat, wherever possible, can play important roles in such integrated responses". Besides, it argues that "key enablers for implementing effective responses to climate-related changes in the ocean and cryosphere include intensifying cooperation and coordination among governing authorities across spatial scales and planning horizons. Education and climate literacy, monitoring and forecasting, use of all available knowledge sources, sharing of data, information and knowledge, finance, addressing social vulnerability and equity, and institutional support are also essential."

OCEAN IN LATAM'S NDCs

Even though there are a lot of asymmetries in the region, difficulty in articulating and coordinating policies, and a recent weakening of regional integration in the last decade, it is possible to identify some regional initiatives that deal with specific issues on the ocean agenda. These include:

- the Research Network of Marine-Coastal Stressors in Latin America and the Caribbean (REMARCO) wishes to foster cooperation and build capacities on ocean acidification, microplastic, marine contamination, eutrophication, and harmful algal blooms (HABs);

- the Global Ocean Acidification Observing Network (GOA-ON) is global but also promotes regional hubs address ocean acidification – joined the Latin American Ocean Acidification Network (LAOCA) and the North American Ocean Acidification Network (includes Mexico) include the countries analyzed in this article;
- the Regional Alliance in Oceanography for the Upper Southwest and Tropical Atlantic (OCEATLAN) represents the regional effort of institutions from Argentina, Brazil, and Uruguay, committed to the planning and implementation of an operational oceanographic system whose purpose is to monitor and investigate oceanic processes in the South and Tropical Atlantic; and
- The Central American Integration System (SICA) and the Caribbean Community (CARICOM) have also collaborated on coastal adaptation and ocean resilience issues.

Given that ecological, financial, institutional, and governance constraints for such actions exist especially in developing countries such as LATAM's, there is a need to design more than just policies to promote the blue economy or related policies, such as the MSP policies analyzed in the previous section. It is mandatory to look at high-level official instruments for combating climate change, the responsibility of the different actors, the competencies of the different institutions, and financing mechanisms. Thus, "while climate change has and will continue to have serious detrimental impacts on sustainable ocean economy assets, ocean ecosystems offer both nature and technology-based solutions for climate change mitigation and adaptation measures".

In the Second Nationally Determined Contribution of the Argentine Republic, there are 4 direct mentions of oceans, 12 maritime, 2 marine, and 28 coastal (low coastal zone, coastal region, coastal erosion, and coastal management), highlighting the role of the Pampa Azul initiative as an articulated project between several ministries and national agencies that will generate scientific knowledge that will serve as input for the preservation and sustainable management of marine resources and ecosystems (MAyDS, 2020). There is no direct mention of MSP or blue economy, although there is mention of the preservation of ocean ecosystem systems, cooperation, and marine scientific research activities to address climate change and the oceans, and safety of navigability in the face of rising tide heights and changing ocean conditions. It also highlights the role of the La Plata Basin, the second most important in South America in terms of geographical extension and river flow, which is also integrated into the national territory, providing important ecosystem services and fishery resources of commercial interest that support fisheries of global relevance.

The ocean-climate and technology-ocean nexus are directly mentioned. First, the Argentine NDC stresses the particularities of the impacts of climate change on Argentine maritime spaces and coastal areas, in addition to the infrastructure in the coastal zone; second, the Pampa Azul initiative will promote the generation of technological innovations that contribute to the strengthening of industries linked to the sea and the economic development of Argentine maritime regions, as well as a greater awareness in society about the national maritime heritage

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and the responsible use of its resources. Regarding biodiversity and ecosystems, the Argentine NDC seeks to implement a coastal management program aimed at protecting ecosystems and populations located in the most vulnerable areas, with specific mention of the tourism sector. In the document Argentina's Net Emissions Target Update to 2030 (October 2021), the only section that directly mentions cost resources in the document was evaluated in the Second NDC of the Republic of Argentina. Other keywords do not appear in the document in question (Argentina, 2021).

Published in March 2022, the Brazilian NDC ratifies that "Brazil confirms its commitment to reduce its greenhouse gas emissions in 2025 by 37%, compared with 2005. Additionally, Brazil commits to reduce its emissions in 2030 by 50%, compared with 2005. Brazil's commitments also include a long-term objective to achieve climate neutrality by 2050" (Brasil, 2022:1). In this new version of the document, there is no mention of the terms ocean, marine, maritime, MSP, or blue. Coastal resources are mentioned only once. This effectively reveals the little role given to the blue economy in promoting cleaner and less polluting economic activities, especially considering the length of the national coastline, the policies related to the Blue Amazon, and the already existing ocean-based industries such as offshore O&G.

However, Brazil's updated NDC (November 2024) signals a significant shift, demonstrating a heightened awareness of the ocean's critical role in climate mitigation and adaptation. The document, while still primarily focused on land-based emissions, introduces new commitments and frameworks that lay the groundwork for a more comprehensive integration of ocean-based solutions. This includes a renewed emphasis on sustainable development, a commitment to climate federalism, and a focus on ecological transformation, all of which provide avenues for future ocean-centric climate actions. The inclusion of offshore wind energy production and the promotion of a bioeconomy, as outlined in the updated NDC, are particularly noteworthy as they directly relate to the blue economy and offer promising pathways for Brazil to leverage its vast marine resources in its climate strategy. This evolving perspective underscores a growing recognition within Brazil of the intrinsic link between ocean health and climate resilience, reflecting a maturing understanding of the ocean-climate nexus.

In the 2020 update of the Chilean NDC, there are 15 mentions of ocean, 23 of marine, and 8 of coastal. There is no mention of maritime, offshore, or blue. The document relates the discussions to the SDGs of the UN's 2030 Agenda (linking SDG 13 to 14, in terms of the blue economy), citing different bibliographical references (MMA, 2020). Among the Integration Components, there is a short section dedicated exclusively to the ocean, which highlights that Chile now has 39 marine protected areas, which represent, in coverage, 42% of the EEZ surface, quadrupling the target requested by the UN in 2020 within the framework of the Aichi targets of the Convention on Biological Diversity (CBD). In terms of marine protected areas, Chile is committed to (MMA, 2020):

- Create new MPAs in under-represented marine ecoregions, considering criteria related to the effects of climate change and the construction of a network of marine protected areas, among others, for the identification of such areas. In addition, protected areas will be created in coastal ecosystems on wetlands, fiscal lands, and national public-use properties that complement the marine network;
- All MPAs in Chile created before 2020 will have their management or administration plan and will be under effective implementation, including actions to adapt to the effects of climate change; and
- Assess the co-benefits that different marine ecosystems in MPAs provide in terms of mitigating or adapting to climate change and implement actions to enhance these co-benefits.

Regarding the contribution to adaptation, the NDC reports that by 2022 the first adaptation plans for the water resources, coastal edge, and mining sectors will have been developed and will be implemented. There is no mention of seas, oceans, or coastline in the mitigation component of the updated version of Chile's NDC. Neither are indigenous peoples and local communities considered in the contribution to oceans and the role they play, for example, in the protection of marine protected areas in Chile (Burdiles and Madariaga, 2020).

In contrast to the Brazilian case, Chile needs to advance along this line, considering the 6,435 km of coastline in the country (MMA, 2021). In the brief document Strengthening the NDC, curiously Chile does not highlight the role of the ocean (MMA, 2022).

In the case of Colombia, in addition to the 2020 NDC Update (112 pages), there are two other related documents: (i) a portfolio of sectoral climate change mitigation measures (75 pages); and (ii) a portfolio of climate change adaptation targets (62 pages) - all published in 2020. Despite the length of the document, there are only 2 mentions of ocean, 52 of marine, and 12 of blue carbon. There is no mention of maritime, MSP, offshore, or blue economy. It should also be noted that the country has 12,817,181ha of marine protected areas (68.9% of the area of terrestrial protected areas).

As in the case of Chile, there are parallels with different SDGs in the UN's 2030 Agenda. As for the updated adaptation targets for the NDC formulated in 2020, they include reducing the vulnerability of mangrove and seagrass ecosystems through the formulation and implementation of ecosystem-based adaptation (EbA) measures in coastal environmental units (CEUs). Interestingly, among the sectoral GHG emission mitigation measures or strategic lines, there is no reference to SDG 14.

Within the Colombian Ministry of the Environment, there are programs/projects directly related to marine-coastal zones, such as: (i) strengthen, implement and adopt the "Information system for the integrated management of mangroves in Colombia"; (ii) determine mangrove and seagrass cover in the coastal environmental units of the Caribbean and Colombian Pacific; (iii)

development of a module for recording monitoring and evaluation (M&E) results of climate change adaptation initiatives using mangroves and seagrasses (blue carbon ecosystems) in Colombia's marine environmental information systems (SIAM), interoperable with the Vulnerability, Risk and Adaptation Information System (SIVRA) and the National Climate Change System (SNCC); (iv) basic and applied science program for the creation of knowledge on the role of mangrove and seagrass ecosystems in the territories for climate change adaptation and risk management; and (v) create a subsystem for M&E of initiatives (programs and projects) for climate change adaptation using or being implemented in marine and coastal ecosystems, with particular emphasis on mangroves and seagrasses (Gobierno de Colombia, 2020).

Among the support needs to strengthen national capacities, the Colombian Ministry of Environment requires: (i) design, consolidate, and implement a mangrove governance network to consolidate mangrove self-governance; (ii) design, implement and monitor actions to restore deforested and degraded mangroves on the Colombian coast; (iii) strengthen the institutional capacity of environmental authorities to facilitate the implementation of EbA actions in the UACs; (iv) involving local communities in capacity building processes for EbA in the framework of the implementation of the Coastal Environmental Unit Integrated Management and Management Plan (POMIUAC); (v) exchange of successful experiences for the development of a Portfolio of Nature-based Climate Solutions (SCbN) as an option for climate change adaptation using marine and coastal biodiversity; and (vi) training and preparation program for the formulation and implementation of climate change adaptation initiatives using mangrove and grassland ecosystems; (vii) training and preparation program for the formulation and implementation of climate change adaptation initiatives using mangrove and grassland ecosystems; (viii) training and preparation program for the formulation and implementation of climate change adaptation initiatives using mangrove and grassland ecosystems; and (viii) training and preparation program for the development of a portfolio of SCbN as an option for climate change adaptation using marine and coastal biodiversity (Gobierno de Colombia, 2020).

In terms of the financial support needed, the following are necessary: (i) mobilization of resources for the implementation of the "National program for the sustainable use, management and conservation of mangrove ecosystems" (US$ 20 million); (ii) management of resources to quantify the carbon content in mangrove areas of the country through the preparation and implementation of the national forest inventory (US$ 770,000); (iii) Program for the development of a sub-system and platform for monitoring and evaluation (M&E) of adaptation to climate change and climate variability in coastal environmental units (US$ 500,000); and (iv) strengthening Colombia's Climate Action Tool through a portfolio of adaptation and SCbN measures applicable to coastal environmental units (UAC) (US$ 150,000) (Gobierno de Colombia, 2020).

Ecuador has only one version of the NDC, and it is the oldest of all those analyzed in this article (March 2019). There are 3 mentions of sea, 5 of marine, and 8 of coastal, with no mention of ocean, maritime, offshore, blue, or MSP (Gobierno de Ecuador, 2019). The National System of Protected Areas groups together the set of natural areas that guarantee the coverage and

connectivity of important ecosystems at the terrestrial, marine, and marine-coastal levels, as well as their cultural resources and main water sources.

In the coastal zone, changes in coastal dynamics require the implementation of adaptation measures in response to the rise in average sea level, the receding coastline, increased water temperature, acidification, lack of protection against extreme weather events, and human and economic losses. Although there are no verifiable forecasts on the rise in sea level in Ecuador, the data handled at the global level foresee rises that allow us to consider this phenomenon as a threat with significant incidence, fundamentally in the lowest areas, which may give rise not only to an increase in flooding but also to an acceleration of coastal erosion and the salinization of aquifers and the final stretches of rivers.

Regarding climate change adaptation and mitigation, Ecuador's NDC mentions the Organic Environmental Code (2017), which provides a comprehensive, modern, and effective regulatory framework for integrating adaptation into the country's sectoral and local development planning. Art. 261 states that the National Environmental Authority will coordinate with the prioritized sectoral entities for the effect and based on local capacities the management in an integrated manner of the marine-coastal zone, as well as the promotion of its adaptive capacity to the effects of climate variability and change (Gobierno de Ecuador, 2019). Although it makes no direct mention of the blue economy, the Ecuadorian NDC uses data from the Central Bank of Ecuador, underlining that processed seafood products account for around 25% of the country's exports.

In the case of Mexico, the 2022 NDC update mentions ocean and coastal 4 times, seas 2 times, and marine 9 times. Together with Colombia's NDC, they are the only ones among those analyzed that mention blue carbon (in this case, 5 times). There is no direct mention of the blue economy, offshore activities, or MSP (Gobierno de Mexico-SEMARNAT, 2022). It mentions that waste management in the country generates significant contamination problems in the localities where it is disposed of, as well as in water bodies and oceans.

Regarding the conservation, restoration, and sustainable use of biodiversity and ecosystem services, the updated document integrates priority issues for the country based on the conservation and restoration of blue carbon ecosystems, seas and oceans, forests, and priority species, among others. As in the NDCs of Chile and Colombia, there is mention of different SDGs of the UN 2030 Agenda, in this case tying SDG 13 and SDG 14.

Among the most relevant issues addressed in the adaptation component with synergies to mitigation are integrated management of water resources, conservation and restoration of marine ecosystems, and restoration, and conservation of blue carbon ecosystems and coral reefs. The increased ambition of the Mexican NDC includes a National Blue Carbon Strategy, in which our country will work to protect mangroves, seagrasses, and national marshes, an important carbon reservoir in our country that is currently threatened by unsustainable economic activities. Mexico is the 12th country with the largest marine-coastal resources and ecosystems and has 775,555

hectares of mangroves, 400,000 hectares of seagrasses, and 133,000 hectares of marshes (Gobierno de Mexico-SEMARNAT, 2022).

In Peru's 2021 NDC update, there is only 1 mention of low-lying coastal zones and no mention of ocean, marine, maritime, sea, offshore, MSP, or blue (Gobierno del Perú, 2021). In Uruguay's 2022 NDC update, there are 96 mentions of coastal (referring to zone, sector, space, dynamics, departments, infrastructure, adaptation, climate change, area, vulnerability, ecosystem, erosion, and management), 10 mentions of ocean (often referring to the Atlantic Ocean), 2 of MSP (the only NDC among those analyzed that mentions this policy), 2 of marine, 2 of blue infrastructure, 1 of blue jobs, and 1 of oceanography (Gobierno de Uruguay, 2022). Considering that 70% of the Uruguayan population lives in the coastal departments, this is undoubtedly the NDC that most highlights the role of maritime and oceanic spaces and resources among those analyzed in this article.

In terms of adaptation measures by area, by 2030 the National Biodiversity Strategy, the Strategic Plan for the National System of Protected Areas, Marine Spatial Planning, and the Land Degradation Neutrality Strategy incorporate climate change and variability. Regarding the contributions to the global objective, although it does not directly mention the blue economy, it stresses the need to carry out by 2030 training instances for labor reconversion/training to strengthen competencies associated with green and blue jobs, particularly considering the inclusion of women and socially vulnerable populations. In addition, it mentions that the alteration of the coastal space is also relevant because it serves recreational purposes and as a transit area for essential services, including health, education, and access to jobs.

Coastal adaptation involves many challenges in Uruguay, therefore responses to climate change in the coastal zone will need to be multidisciplinary, socially complex, long-term, and flexible to change. Technical barriers identified to address the impacts of climate variability and change in the coastal area included lack of quality data or lack of access to existing data, methodologies, and tools to assess climate change risks and to implement adaptation measures or establish metrics and procedures to evaluate adaptation processes. Other barriers included coordination between national and local levels and a lack of qualified human resources (Gobierno de Uruguay, 2022). Unfortunately, this reality has also been identified in other LATAM countries.

In fact, smaller countries like Uruguay have been more proactive in incorporating ocean-related targets into their NDCs. Uruguay's Third NDC (December 2024) exemplifies this proactive approach, showcasing a robust and integrated strategy that positions the ocean as a central element of its climate policy. The document highlights Uruguay's commitment to increasing marine protected areas and developing a 'Blue Uruguay 2030' roadmap, which aims to achieve 30% MPA coverage by 2030 through Marine Spatial Planning (MSP). Furthermore, Uruguay's NDC emphasizes the importance of adaptation measures for its coastal zones, recognizing the country's vulnerability to climate change impacts such as sea-level rise and extreme weather events. The detailed focus on climate justice, gender perspective, and the inclusion of financial and private

sector actors in its climate action framework demonstrates a holistic approach to ocean governance. This comprehensive and forward-looking strategy not only reinforces Uruguay's leadership in the region but also provides a compelling model for other nations seeking to effectively integrate ocean-based solutions into their NDCs.

Finally, the updated version of Venezuela's 2021 NDC contains 49 mentions of coastal (almost always to coastal zones), 7 mentions of marine, 4 mentions of ocean (repetition of paragraphs on mitigation), and 4 of maritime transport, with no direct mentions of offshore, MSP, blue economy (República de Venezuela, 2021). Like the NDCs of Chile, Colombia, and Mexico, it also aligns policies with the SDGs of the UN's 2030 Agenda.

Even with the diagnosis that the NDCs are currently insufficient to address the climate crisis, the ocean-climate nexus does not seem to play a key role in the countries' NDC mitigation and adaptation agenda. "Although a majority of countries referenced the ocean in their first round of national climate goals under the Paris Agreement, only a minority discussed ocean actions as climate solutions." (Ocean Conservancy, 2023:1). Fewer than 20 percent of countries with coastal blue carbon ecosystems, for example, discussed their role as carbon sinks (Herr and Landis, 2016; Gallo, Victor, and Levin, 2017; Taraska, 2018). This is also reflected in the reality of the LATAM countries, as shown in Table 3.

Table 3- Ocean-related issues covered in the update of the NDCs of the LATAM countries

Ocean-related issues	Country
Reducing emissions from shipping and ports	Venezuela
Protecting and restoring blue carbon ecosystems	Argentina, Chile, Colombia, Mexico, Uruguay, and Venezuela
Advancing MPAs	Chile, Uruguay, and Venezuela
Protecting coastal communities and infrastructure	Argentina, Chile, Uruguay, and Venezuela
Protecting coastal and marine ecosystems and biodiversity	Argentina, Colombia, Mexico, and Uruguay
Creating climate-ready fisheries	Argentina, Chile, and Peru
Advancing ocean-climate justice	Argentina and Uruguay
Enhancing a blue economy	Argentina

Source: Author.

None of the LATAM countries deals specifically with energy (scaling up offshore renewable energy or reducing emissions from offshore oil and gas), despite the importance of this sector in the region. Argentina's updated NDC stands out for its detailed agendas and is the only one that deals specifically with the blue economy. The updated version of Brazil's NDC does not directly

mention any of the ocean-related issues. Because it has not been updated, Ecuador's NDC was not even considered in the analysis.

This shows that the LATAM countries do not yet see the ocean as an essential space for promoting sustainable development in the region nor as a key vector for climate action. Against this case, "out of 106 new or updated NDCs from island and coastal states, 77 (73%) include at least one target, policy, or measure aimed at ocean-based climate actions and 31 of those include at least one target, policy, or measure aimed specifically at supporting vulnerable ocean-dependent communities." (Khan, Northrop, and Schindler Murray, 2022, p.1).

Thus, the analysis of these updated NDCs reveals a nascent but significant trend in Latin America towards a more holistic understanding of the ocean-climate nexus. While challenges remain in fully integrating ocean-based solutions across all NDCs, the advancements made by Brazil and Uruguay underscore the growing recognition of the ocean's indispensable role in achieving global climate goals. This evolving landscape presents a unique opportunity for enhanced regional cooperation and the development of innovative policies that leverage the vast potential of the blue economy for climate action.]

CONCLUSION

This article has explored the evolving integration of the ocean-climate nexus within the Nationally Determined Contributions (NDCs) of Latin American countries. Our findings reveal a critical, albeit nascent, shift towards acknowledging the ocean's pivotal role in both climate mitigation and adaptation strategies within the region. While the initial NDCs from many LATAM countries demonstrated a limited engagement with ocean-related issues, the latest submissions, especially from Brazil and Uruguay, indicate a growing awareness and a more deliberate effort to incorporate marine and coastal considerations.

It is time to make waves for a blue agenda in LATAM, paving the way for a significant transition in the region. These strategies are essential not only to put the countries of the region at the forefront of the blue agenda but will also contribute greatly to overcoming the region's historic and structural problems of social inequality and economic development. Many of the region's current shortcomings have structural roots and date back to the time of colonization in the 16th and 17th centuries. Therefore, only a significant change in the way politics is done can overcome these challenges. It is then imperative that countries that have historically had their economies almost exclusively developed over the last five centuries focused on foreign trade, basically exporting raw natural resources with little added value, see the sea/ocean as a great opportunity for the region's global reinsertion. Undoubtedly, this potential can be encouraged through the promotion of the blue economy.

In the context of the Paris Agreement and the UN Ocean Decade, the lack of clear policies to promote the blue economy, linking it to climate mitigation and adaptation, seems like a missed opportunity for the region to stand out. The wealth of marine biodiversity in LATAM, the relevance

of global maritime navigation with interfaces to the Atlantic Ocean and Pacific Ocean, and the growing prominence of blue ecotourism especially in the Caribbean region are just some of the justifications that should motivate a regional agenda in favor of the blue economy (particularly as a response to the impact on economic growth resulting from the COVID-19 pandemic). Placing the climate agenda at the center of this effort as a driver of regional engagement in the main themes of the global agenda, such as sustainable development, the blue economy, climate action, and the generation of inclusive and decent jobs, would make this blue step help achieving the different goals of the 2030 Agenda beyond SDG 14 itself.

Each country in the region indeed has its particularities and, especially in the larger countries, each geographical space has its specificities. In South America, some countries face the Atlantic Ocean and others the Pacific Ocean. The Gulf of Mexico, on the other hand, can be understood as a closed area. Therefore, geography can be key in promoting easier regionalism in some areas and can affect regional integration policies not limited to land spaces and relevant sectors of the blue economy in LAC countries (Santos and Colgan, 2023).

It is therefore possible to envision sea change, placing marine, maritime, and oceanic spaces as important vectors for regional development. To this end, it is important to bring communities with science and innovation, investments in education and research, and funding for new sustainable projects that are sensitive to the blue, environmental, and climate agenda. It is necessary to achieve a great national agreement in different countries to define the national maritime vision and strengthen the ocean policy in which all the actors involved, the national government, local governments, coastal communities, private enterprises, and universities participate. Thinking in LATAM, international cooperation, and regional integration can play a key role in this process.

In this sense, there is a lack of blue and climate economy-oriented governance in LATAM, as well as financial resources to support related projects and policies. Thus, the role of national and regional development banks, private actors, and international cooperation is paramount. Promoting ocean literacy, capacity building, and training of personnel oriented towards the blue agenda, a thematic-sensitive portfolio of investments, and the implementation of policies seem both crucial and urgent to overcome the challenges and gaps in this agenda in LATAM.

Given that there is no standard in the NDCs in their different versions, any comparative analysis between the countries of the region is difficult. In any case, little importance is given to marine, maritime, and ocean spaces in the climate agenda of LATAM countries, which goes against the latest research published by the IPCC. Therefore, to promote a blue agenda in LATAM, each country in the region needs to effectively understand that promoting blue growth policies requires changing the status quo in the design and modus operandi of development policies. Involving many actors, sectors, norms, regulations, and policies at different levels, governance, transparency, and communication seems key to changing the region's sustainable development

roadmap. This is paramount, considering that 2030 is the deadline for both the 2030 Agenda and the UN Ocean Decade.

The following bullet points sum up the main challenges in promoting this blue agenda in the region, serving as a baseline for further and future studies:

- Theory and concept: reviewing the fundamental theoretical and conceptual IR foundations, which are heavily focused on concepts such as land borders and national sovereignty. These foundations hinder the addressing of current global agendas, such as climate change and ocean, marginalizing alternative policies and complementary perspectives to mainstream approaches;
- Governance and implementation: despite the increasing recognition of the ocean's significance in the climate agenda, many Latin American countries face substantial governance and implementation challenges due to financial, institutional, and technical constraints. Moreover, the exploitation of marine resources, such as offshore oil and gas, often conflicts with conservation and climate adaptation objectives;
- Education (ocean literacy), awareness, and public engagement: Promoting educational programs, awareness campaigns, and the involvement of local communities, civil society, and youth should be an integral part of national strategies to enhance coastal resilience and protect marine resources. This approach aligns with the objectives of the UN Ocean Decade; and
- Economic growth pressures: the exploitation of marine resources for economic purposes creates tensions between economic growth objectives and the need for environmental protection. It is essential to balance this dynamic by ensuring the promotion of a sustainable, inclusive, equitable, resilient, and circular blue economy.

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