

Climate Change and the Law of the Sea: Adapting the Law of the Sea to Address the Challenges of Climate Change

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Conference Report

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The Centre for International Law (CIL) at the National University of Singapore (NUS) hosted a two-day international conference on Climate Change and the Law of the Sea: Adapting the Law of the Sea to Address the Challenges of Climate Change on 13-14 March 2018. The objective of the conference was to bring together leading legal and scientific experts to discuss the impacts of climate change on the marine environment and on uses of the sea and the challenges they pose to the law of the sea. The conference also aimed to examine how the law of the sea could be used both to respond to climate change impacts on the oceans and also to support mitigation and adaptation measures.

Panel 1 – Fundamentals: Science and Law

The first panel introduced to the participants the fundamentals of both climate change science and the climate change legal regime. Professor Lisa Levin from the Scripps Institution of Oceanography gave a presentation on 'The Changing Ocean, Ecosystem Consequences and Solutions'. Professor Levin explained how human activities are increasing the concentration of greenhouse gasses (GHG) in the atmosphere at an unprecedented rate with a corresponding rise in global temperature. The oceans experience both direct and indirect effects of climate change. Professor Levin described the role of the oceans in absorbing most of the heat resulting from GHG emissions, with the effect that the oceans have measurably warmed, yet not in a uniform way. This increased ocean temperature has caused species to move towards the cooler water near the Earth's poles, as well as coral bleaching. Another effect of a warming ocean is its reduced capacity to hold oxygen, forcing species to move closer to the surface where they are more exposed to fishing and predators, making them vulnerable to overfishing and further depletion. Warmer water also leads to increased stratification, meaning that there is less mixing between layers of the ocean and reduced food supply to the deep sea. The natural absorption of carbon dioxide by the ocean leads to acidification, an effect of which is the dissolution of the structures of organisms made out of calcium carbonate (such as hard corals). Professor Levin described how these climate change impacts are amplified by the multitude of stressors on the oceans from a variety of human activities such as fishing, mining and litter. Professor Levin also discussed the results of a study into the content of Paris Agreement Nationally Determined Contributions (NDCs), 70% of which included marine actions. The states with the greatest focus on marine actions in their NDCs were small island developing states or states with large low-lying coastal populations. Industrialised states and those with economies in transition placed far less focus, or no focus at all, on marine actions in their NDCs. A key message from Professor Levin's presentation was that the ocean is the greatest climate change mitigator, and that we need to think creatively on how to address climate change in order to be in a position to keep benefiting from the ecosystem services it provides.

Associate Professor Jolene Lin from the Asia-Pacific Centre for Environmental Law at the NUS Faculty of Law gave a presentation on the international climate change legal frameworks and institutions. She introduced the general principles of the climate change legal regime such as the 'common concern of humankind', 'common but differentiated responsibilities and respective capabilities' and 'equity'. Professor Lin gave an overview of the Paris Agreement,

which as the major binding international agreement operationalising states' climate change mitigation and adaptation obligations also has important implications for the law of the sea. The core objectives of the Paris Agreement are to keep temperatures well below 2°C above 1990 levels while making efforts to stay below 1.5°C; to increase the ability of the global community to adapt to climate change; and to transform finance flows towards low-GHG emission economics. Rather than a top down system, the Paris Agreement mitigation obligations are to be implemented at the national level through NDCs. Parties are to submit their NDCs every five years, and each NDC must represent a progression over the previous NDC. The Global Stocktake is an aggregate study that assesses whether the entire international community is on track to achieve the overall target of below 2°C. More so than earlier climate agreements, the Paris Agreement makes adaptation a priority. Transparency is also emphasised in the Paris Agreement, with a transparency framework in order to build mutual trust and confidence in the GHG mitigation and adaptation measures undertaken and to track the money received from developed nations. Professor Lin also discussed the Kyoto Protocol's Clean Development Mechanism, by which developed states with emission reduction targets could pay developing states to carry out climate mitigation projects in exchange for carbon credits. Professor Lin compared this mechanism to that under the Paris Agreement, which provides that both developed and developing states may host projects and use mitigation outcomes to achieve their NDCs.

During the discussion session, comments and questions focussed on the relationship between UNCLOS and the climate change regime. The question was raised whether the obligations in UNCLOS are stronger than under the Paris Agreement, and whether law of the sea could be used to strengthen the Paris Agreement. The inclusion or lack of inclusion of climate change in the BBNJ negotiations was also discussed, with one response being that although climate change may not be directly mentioned, marine protected areas (MPAs) increase resilience and can be a way to address climate change impacts. It was also raised that environmental impact assessments (EIAs), another major aspect of the BBNJ discussions, can reduce stressors on the marine environment by assessing cumulative effects thus also helping to build resilience. Questions and comments were also made about finance mechanisms established under the agreements and whether these came to fruition and had an impact on commitments made. It was accepted the oceans have been neglected somewhat in these mechanisms with a possible reason being that it is difficult to account for resources in the absence of jurisdictional boundaries. It was also noted that the climate change negotiations and agreements have historically been dominated by government agencies from the forestry or environment ministries rather than the ministry responsible for oceans, which could also explain why oceans do not feature prominently in the finance mechanisms.

Panel 2 – Regional Perspectives

The second panel narrowed the scope of the discussions to examine how climate change affects a particular region, Southeast Asia, and how a particular region, the Pacific, is using the law to respond to climate change. Mr Clement Yow Mulalap, of the Permanent Mission of the Federated States of Micronesia to the United Nations, gave a presentation on how Pacific Small Island Developing States (PSIDS) are using or planning to use the law of the sea to address climate change and related natural phenomena. Mr Mulalap began by describing the effects of climate change and how they particularly affect the PSIDS due to their vulnerability to weather events and close relationship to the marine environment for survival and way of life. For example, climate change alters winds and waves which will impair the ability of Pacific Islanders to use traditional instrument-free navigation. The PSIDS in 2017 made a proposal to the International Law Commission (ILC) for a new topic of work on the legal implications of sea level rise. The Federated States of Micronesia built on this proposal and submitted a formal national communication to the ILC covering four non-exhaustive questions of international law raised by sea level rise: the implications for maritime zones; implications for statehood; implications for human rights; and implications for human migration. Mr Mulalap outlined the work being undertaken by the PSIDS in other arenas including through the High Ambition Coalition for Shipping calling for reductions in GHG emissions from shipping at the International Maritime Organization (IMO). Despite the discussions during Panel 1 regarding the absence of climate change in the BBNJ discussions, the PSIDS have been active at the BBNJ negotiations, where they made a submission including linkages between climate change and the BBNJ effort, particularly in relation to area-based management tools. The Global Pact for the Environment is an initiative championed by the French government to develop an international instrument enshrining fundamental principles of international environmental law. The PSIDS are interested in whether this initiative could harmonise climate change law and the law of the sea. Finally Mr Mulalap discussed the ILC's work on the identification of customary international law, in relation to particular custom, and whether traditional and historical knowledge and practices of PSIDS had become rules of regional customary international law.

Assistant Professor Danwei Huang from the NUS Department of Biological Sciences built on the earlier presentation given by Professor Levin to outline how marine ecosystems in Southeast Asia are affected by climate change. He began by introducing the participants to the importance of the marine environment in Southeast Asia as the global centre of biodiversity, with one third of the world's coral. Like Professor Levin, Professor Huang separated the impacts of climate change on the oceans into direct and indirect categories. A direct effect of CO₂ introduction into the ocean is acidification, which as Professor Levin also described, leads to erosion of carbonate structures including coral. Southeast Asia's coral will also be affected by warming water temperatures which has already caused observable coral bleaching. Professor Huang stated that although corals will survive climate change, they will move from the equator to cooler waters and there will be a loss of their ecosystem services in Southeast Asia. On a more positive note, in areas such as Japan and South Korea there will be benefits from the expansion of coral into the region. Corals are also affected by rising sea

levels, as reduced access to sunlight adversely impacts their development. Professor Huang highlighted MPAs as a way to manage ecosystems in Southeast Asia in response to climate change. He however stated that there is limited MPA coverage in Southeast Asia and there is therefore a need to expand its extent and effectiveness. Professor Huang put the global climate mitigation efforts into perspective by describing the severe effects of a 0.8°C temperature rise on coral, and questioned how relevant the Paris Agreement target of below 2°C is for coral reefs.

In the question and answer session, questions were raised regarding how the Global Pact for the Environment would be able to harmonise climate change law and law of the sea. The response given was that it would allow states to grow links between climate change and the law of the sea and to identify commonalities and encourage parties to the Pact to harmonise their efforts internally as well as externally. Principles and concepts identified through the Pact process would allow them to be used in different fora. The concept of particular custom was also raised, with the participants and speakers discussing what the content of the customary law obligation would be. It was suggested that Pacific island nations have adopted laws that deal with the ocean in particular ways, and to the extent that these laws have been endorsed by non-Pacific states they would then be bound by these particular customary rules. However the point was made that the ILC commentary adopted in 2016 along with the draft conclusions regarding the identification of customary international law stated that the application of the two-element approach (state practice and *opinio juris*) is stricter in the case of particular rather than general customary international law. The work of the International Law Association (ILA) on international law and sea level raise was also mentioned, as well as the potential for the ILC to include that topic on its agenda in the future.

MPAs as a tool to protect the marine environment were discussed, and it was agreed that connectivity is an important element to consider when planning such measures. Another issue relating to MPAs was whether climate change-related changes in ocean circulation would have an impact on connectivity patterns. While it has not been studied extensively to date in the South China Sea or the Pacific region, it was considered that changes in ocean circulation will affect population connectivity. However it is not known how this will affect where MPAs are sited. The size of MPAs was also discussed, with larger areas in theory better able to protect the entire development cycle of organisms. It was also pointed out however that with larger MPAs it is important to be careful to not just have an MPA on paper, and that proper management is essential.

Panel 3 – Climate Change: Impacts on Baselines and Maritime Boundaries

Panel 3 focussed the discussions on the effects of climate change on coasts, particularly due to sea level rise, and the resulting legal issues. Professor Clive Schofield from the Australian National Centre for Ocean Resources and Security at the University of Wollongong gave a presentation on ‘Dynamic Coasts and Sea-Level Rise: Geographic Aspects of Shifting Baselines’. In his presentation Professor Schofield not only covered changes to coastlines due to sea level rise, but also highlighted the dynamic nature of coasts, which may change for a variety of reasons. Professor Schofield questioned whether the rise in mean sea level rise of up to 0.98m by 2100 as predicted by the Intergovernmental Panel on Climate Change’s (IPCC) Fifth Assessment Report is overly conservative, as the rise could be up to 2m. There is uncertainty also regarding the scale and speed of the rise, and there will be significant spatial and temporal variability on a global scale. A factor increasing pressure on coasts and coastal ecosystems is the increasing concentration of population and development in the coastal zone, a phenomenon known as ‘coastal squeeze’. At a simplistic level, rising sea levels will mean recession of baselines, which are generally considered to be ambulatory. Therefore not only will states lose land territory, but they will also lose areas of maritime jurisdiction, which will be particularly dramatic for maritime entitlements from small features. However Professor Schofield explained that the simplistic view of sea level rise ‘marching up the contours’ ignores the complex interactions between gradient compositions and morphologies. He also stressed that relative sea level rise is critical, with the impacts of sea level rise varying depending on the gradient of the coast and also on coastal ecosystems such as coral reefs, mangroves, dunes, seagrass beds and salt marshes. These ecosystems provide key ecosystem services and can provide protection to the coast. Ecosystems such as mangroves and salt marshes are able to move landward with sea level rise or may increase their vertical elevation through sedimentation, however landward movement is not possible when the coastline is affected by coastal squeeze. Professor Schofield also highlighted the historical resilience of reefs, which have to date been able to adapt through fast upward growth, though it is questionable whether reefs will be able to keep up with accelerated sea level rise, compounded by ocean acidification. He concluded by stressing that when projecting sea level rise we are interested in relative sea level rise and must consider the localised coastal context. While coastal management and mitigation efforts to allow coastal ecosystems to adapt autonomously are crucial, the potential impact of sea level rise on maritime entitlements is dire.

Professor David Freestone, Co-Rapporteur of the ILA Committee on International Law and Sea Level Rise and of George Washington University Law School and the Sargasso Sea Commission gave a presentation on ‘Impacts of Sea Level Rise on the Limits of Maritime Zones and Maritime Boundaries’. In 2012 the ILA Baselines Committee concluded that the normal baseline is ambulatory, and called for the establishment of a committee for the purpose of addressing the concerns that arise from that conclusion. Accordingly the Sea Level Rise Committee was tasked with the mandate to study the impacts of sea level rise and the implications under international law, and to develop proposals for the progressive development of international law in relation to the possible loss of all or parts of state

territory and maritime zones. Professor Freestone identified the two key law of the sea issues as the implications for the outer limits of a state's maritime zones proclaimed in reliance upon a normal baseline, and the negative impacts on existing maritime boundaries. In the first report of the Sea Level Rise Committee, presented in 2016, the Committee considered the options of either recognising ambulatory baselines, fixing baselines, or fixing outer limits. The Committee also considered whether Article 62 of the Vienna Convention on the Law of Treaties regarding fundamental change of circumstance applies to maritime boundary treaties, and if so whether sea level rise is a fundamental change of circumstances. Professor Freestone discussed the emerging pattern of practice amongst Pacific island states of permanently fixing their baselines, limits and boundaries. In the 2015 Taputapuātea Declaration, seven leaders of Polynesian states and territories declared the permanent establishment of their baselines in accordance with UNCLOS, without taking into account sea level rise. States such as the Marshall Islands are publicly and unilaterally declaring their permanent baselines, limits and boundaries to provide clarity and certainty. Professor Freestone outlined the two options currently being considered by the ILA Sea Level Rise Committee: freezing baselines as they are, with internal waters landward of the baselines expanding with sea level rise; or the freezing of outer limits of either the territorial sea (which would expand) or the EEZ (which would expand). The first option would be contrary to the finding of the ILA Baselines Committee that baselines are ambulatory and would create areas of internal waters that may pose risks to the safety of navigation. Freezing the outer limits of either the territorial sea or EEZ would allow the baselines to reflect the actual coastline and they would be ambulatory in accordance with the majority view of the law. However, either the territorial sea or EEZ would exceed the limit in UNCLOS. Professor Freestone acknowledged that either option would breach UNCLOS in some way. Other issues that the Committee is considering are how to deal with existing excessive claims, and what significance to place on the principle of 'land dominates the sea'. An issue separate to that of maritime entitlements is that of the implications of sea level rise for maritime boundary agreements. Professor Freestone asked the question whether it is a problem if a maritime boundary between opposite states ended up being more than 200 M from the coasts. In the case of a boundary between opposite states 400 M apart, if the baselines and maritime zones retreat landward, an area of high seas would grow between the two states. The ILA Sea Level Rise Committee is generally in favour of certainty and stability. If the Committee recommends the freezing of baselines or outer limits then the question of effects on maritime boundaries is solely academic.

The point was raised during the discussion session that with regard to the Vienna Convention and the rule on fundamental change of circumstance, land boundaries only concern two states, but some maritime boundaries have the international community as the absent third party. The comment was made that freezing baselines or maritime zone limits would disregard the rights of the rest of the world. Although disappearing islands are a result of sea level rise, features may also appear or grow due to other reasons. It was therefore asked how international law should respond to the growth and appearance of features, in the context of freezing entitlements due to loss of land territory. It was also highlighted that international law has many principles that serve to preserve stability of land boundaries, with the question

asked whether the ILA Sea Level Rise Committee had considered the application of these principles to their context.

The matter of the wider policy implications of setting boundaries aside for sea level rise was also raised. It was asked whether it is a good idea to set aside treaties already made without complaint by other states. As it is not questioned that states have the right to prevent erosion of existing features by physical means, could it also be accepted that states could defend their features by non-physical means? This was also considered a matter of fairness and equity – is it equitable that states that can afford to do so may physically defend their territories, but those without the means must lose both their territory and maritime zones? As UNCLOS is very difficult to amend, it was suggested that customary law may be the best way to change the law regarding recession of maritime entitlements. A comment was also made that each proposal has pros and cons, and that no matter which is decided, there will be opposition from some states and commentators. The principle of 'land dominates the sea' was also raised during the discussion session. It was suggested by one participant that this principle was relied on for baselines because land was generally permanent. However, now that land is changing due to climate change, it was questioned whether the principle should still be relied on in the same way.

Panel 4 – Climate Change: Status and Entitlement of Offshore Features

Panel 4 focused specifically on the legal issues relating to climate change and offshore features. Professor Rosemary Rayfuse from UNSW Sydney and Lund University gave a presentation on 'Legal Aspects of the Status and Entitlement of Offshore Features or the Law of Diminishing Status'. Professor Rayfuse began by introducing the various types of offshore features. Historically no distinction was made between natural and artificial islands, however starting from the 1958 Convention an island has been defined in the law of the sea as 'naturally formed', as well as surrounded by water and above water at high tide (UNCLOS, Article 121). The general rule is that islands generate the full suite of maritime zones just as continental territory does, however Article 121(3) of UNCLOS includes the category of 'rocks which cannot sustain human habitation or economic life of their own' which are only entitled to a territorial sea. 'Low tide elevations' are above water at low tide but submerged at high tide and do not generate entitlements, but if located within 12 M of the coast, they may be used as a basepoint for measuring the breadth of the territorial sea. Professor Rayfuse summarised this introduction by placing offshore features into four categories: islands (full entitlement to maritime zones), rocks as a subset of islands (territorial sea only), low tide elevations (territorial sea basepoint only), and artificial islands, installations and structures (no entitlements). From this point Professor Rayfuse outlined the implications of sea level rise in terms of maritime zone entitlements for each of the categories of offshore features. Islands risk being downgraded to rocks thereby losing their EEZ and continental shelf, rocks risk becoming low tide elevations and losing their territorial sea, and low tide elevations that disappear under water may no longer be able to be used as territorial sea basepoints. Archipelagic states may no longer meet the requirements of that status, and island states may lose all their entitlements.

Professor Rayfuse then discussed the legal effect of changes to the size of offshore features by natural processes as opposed to by human intervention. Regarding changes by natural processes, if an accretive (slow) change happens to a feature then the status of the feature is changed. However in theory if the change is avulsive (fast) such as from a volcanic eruption, then there should be no change to the legal nature of the feature. In reality however states do change their claims based on avulsive changes. As discussed during Panel 3, preservation by human means does not deprive a feature of its status, but building a feature up will also not change its status (for example from a rock to an island). Enlargement of a natural feature by artificial means may extend the zones that the feature was already entitled to, but it cannot gain new zones it was not previously entitled to. Changes to the status of or disappearance of features may mean that archipelagic states no longer satisfy Article 47 of UNCLOS, and would therefore no longer be able to draw archipelagic baselines enclosing their islands. If all islands of a low-lying state are rendered uninhabitable, that state may lose its status and entitlements, or in an extreme case may lose its statehood.

Professor Rayfuse concluded by discussing possible answers to these serious issues. She stated that sea level rise is avulsive not accretive, and that the disappearance or diminishment of features is caused by artificial means and against the will of the state. Professor Rayfuse

stated that therefore perhaps features at risk from sea level rise should not lose their status. This is supported by the finding in the South China Sea arbitration that it is the natural state of the feature that determines its status. Professor Rayfuse concluded that legal status is *prima facie* ambulatory, however status can be maintained but not enhanced by human intervention. Where this is not possible due to financial circumstances or practical reasons, there are legal arguments to support the maintenance of the status and entitlement of naturally occurring offshore features.

Second to speak on Panel 4 was Professor Nilüfer Oral of Istanbul Bilgi University and member of the International Law Commission. Professor Oral's presentation on 'International Law, Adaptation to Sea Level Rise and Disappearing Islands' built on the presentation given by Professor Rayfuse, focusing particularly on the legal regime for adaptation. She began by referring to the IPCC definition of 'adaptation' which includes '[a]n adjustment in natural or *human systems* in response to actual or expected climatic stimuli or their effects'. Professor Oral raised the question of whether 'human systems' could include legal systems, so that changing the law in response to climate change could qualify as 'adaptation'. Adaptation can be *in situ* or *ex situ*, and can involve natural adaptation measures such as replanting mangroves or artificial measures such as construction of sea walls. Adaptation can also include island building or preservation and the construction of artificial islands. Professor Oral gave examples of adaptation in practice, such as Singapore's 2011 policy to raise the minimum land reclamation level from 3 to 4 metres above sea level, sea dikes in the Netherlands, and a large-scale artificial island construction project in the Maldives.

Since the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, its states parties have successively adopted agreements and measures to facilitate and encourage adaptation measures. Under the UNFCCC all parties are required to facilitate adequate adaptation to climate change, with developed countries obligated to assist in meeting the costs of adaptation by particularly vulnerable developing countries. In the Cancun Framework adopted under the UNFCCC in 2010, the parties recognised the urgent need to cooperate on adaptation, including supporting the needs of particularly vulnerable developing countries. In 2013 the parties to the UNFCCC adopted the Warsaw International Mechanism for Loss and Damage, which contains the financial component for developed countries to help developing states adapt to climate change. In the Paris Agreement (2015), adaptation was particularly highlighted. However Professor Oral identified a problem with the UNFCCC adaptation regime, that it is too focused on cooperation alone, which will not be sufficient to deal with sea level rise. Instead, Professor Oral questioned whether UNCLOS, although it is a pre-climate change instrument, could provide the legal foundation for adaptation to sea level rise, such as relating to islands and baselines. UNCLOS does not have provisions expressly referring to climate change or adaptation, though it does provide for offshore features including artificial islands as discussed earlier by Professor Rayfuse. Professor Oral highlighted adaptation initiatives including floating city projects, which could be classified as artificial islands. Although the coastal state has jurisdiction under UNCLOS to establish artificial islands, they do not come with any entitlement to maritime zones. The question is whether construction to preserve a naturally formed feature could serve as a legal measure of adaptation to sea level rise. Although the UNFCCC provides a broad framework

for adaptation, it does not address specifically the legal aspects of these measures related to sea level rise. Professor Oral concluded by posing the question whether considering the serious consequences of sea level rise for many states, can international law, such as UNCLOS, adapt to meet this challenge?

During the question and answer session the participants and speakers had a discussion relating to the issue of climate change adaptation measures themselves having an adverse impact on the environment. This was described as a 'clash of precautions', whereby a choice must be made between responding to climate change, or protecting the environment. It was also highlighted that changes to the coast by efforts to protect features can have unexpected consequences, such as changes to sediment transfer. However the point was made that fortification measures could actually have positive environmental impacts as it is an opportunity to improve infrastructure such as sewerage that may currently be inadequate. Island building and fortification may have adverse impacts on the environment, and measures such as sequestering carbon underwater could be in breach of the obligation in Article 195 of UNCLOS not to transform one form of pollution to another. The question of whether Article 212 of UNCLOS contains a legal obligation to take adaptation measures was raised, however the consensus was that that provision was more focussed on mitigation measures. It was agreed amongst the speakers and participants that climate change falls under the definition of marine pollution in UNCLOS. A question was raised whether anyone had considered the fact that warming might be causing changes such as through the dissolution of corals, which would lead to a loss of territory but not due to sea level rise. A related point was that sea level rise may also be due to other causes such as subsidence and extraction of oil and gas or water.

Panel 5 – Shipping and Climate Change

Rather than considering the effects of climate change as the previous panels had done, Panel 5 turned to consider a cause of GHG emissions, being international shipping, and how its emissions can be mitigated through regulation. Professor Aldo Chircop from Dalhousie University and the Centre for International Governance Innovation gave a presentation on 'The Regulation of Greenhouse Gas Emissions from International Shipping: A long-term Challenge for International Maritime Law and the Law of the Sea'. Although it does not specifically address shipping or aviation, the Paris Agreement sets out the overall mitigation goal to keep global temperatures well below 2°C and the shipping industry is expected to do its fair share to meet the long term goal, even in the absence of a specific obligation. He then outlined the relevant provisions in UNCLOS, including the obligation in Article 212 to prevent, reduce and control pollution through the atmosphere and to establish global and regional rules and standards to that end through the IMO. Studies conducted by the IMO show that even with enhanced energy efficiency, emissions from shipping will increase by 50-250% by 2050 on a business as usual scenario. In response to the Paris Agreement, the IMO has developed a roadmap and initial strategy for 2018-2023, which is to be adopted at the meeting of the Marine Environment Protection Committee (MEPC) in April 2018. A long-term strategy will commence in 2023, with the ideal long-term goal being decarbonisation. The key question posed by Professor Chircop in his presentation was 'how is the maritime regulatory system positioned to enable the IMO to lead its membership and the industry towards the long-term goal?' He identified several features of the shipping industry that make the regulatory challenge particularly complex, such as that ships are highly mobile property, there is a diversity of actors, the issue of speed and the need to ensure just-in-time arrival, the long time period needed to recover the cost of ships, and the unequal capabilities amongst national maritime administrations. Professor Chircop also discussed the fact that in the climate change regulatory space there is a convergence of global regimes, namely international maritime law, international trade law, international law of the sea and international environmental law.

He then outlined the fundamentals of the maritime regulatory system, with policy principles of universality, uniformity and no more favourable treatment, and prescriptive principles of compelling need, consistency, proportionality, resilience, clarity and non-retroactivity. Principles specific for GHG regulation include effectiveness, bindingness and equal applicability to all flag states, and cost-effectiveness. One difficulty that arises when regulating GHG emissions in the maritime sphere is how to reconcile the principle of common but differentiated responsibilities with the principle of no more favourable treatment. Professor Chircop then described the regulatory structure and process within the IMO, which consists initially of data gathering, then data analysis, then decision-making, and then potentially review. The work on GHG regulation is carried out by working groups under the MEPC. There are numerous instruments adopted under the auspices of the IMO, both mandatory and non-mandatory, focused on goal and performance based regulations. Industry self-regulation also plays an important role. GHG regulations have already been adopted by the IMO as MARPOL Annex VI and under the International Organisation for

Standardisation (ISO/TC8). The idea of market-based measures has been discussed over recent years, however this is a contentious topic and it remains to be seen whether such measures would be adopted. Professor Chircop discussed the emerging strategy at the IMO and its possible contents and goals. In terms of review, monitoring and compliance of the GHG regulations that the IMO adopts, it will be included in the Paris Agreement five-yearly Global Stocktake, and will be governed by the UNCLOS jurisdictional framework. International maritime law will play a role through the IMO Strategy periodic reviews, port inspections including the port state control memoranda of understanding system, capacity building and other measures.

Professor Chircop concluded by stating that the maritime regulatory system is largely well-positioned to deal with the issue of GHG emissions. Facilitating factors include the large membership of the IMO, the fact that MARPOL Annex VI can be amended by tacit acceptance, the compliance system in place, and the self-regulation of the shipping industry. Constraining factors are however that the process is highly political, there is a debate between aspirations and targets, the principle of compelling necessity could impede the precautionary approach, and that the lowest common denominator may prevail. Although some are concerned that industry is too much in control of the IMO, Professor Chircop stated that environmental NGOs have also been important in the IMO's work to date.

Dr Sun Zhen of CIL gave a presentation entitled 'International Regulation of Arctic Shipping – Polar Code and Further Development'. Dr Sun began by introducing the effects of climate change on the Arctic, not only in terms of temperature rise and melting ice, but also the corresponding effects of increased human activity in the Arctic. With increased access to the Arctic ocean there has been a growth in interest in the area, particularly in oil and gas, and these industries require support from ships. There are many challenges for shipping in the Arctic, including natural hazards, lack of facilities, lack of accurate data and mapping, and lack of experience in polar operations. Shipping also poses risks to the Arctic environment such as potential pollution from oil and other substances, through the introduction of invasive species, and by underwater noise and airborne emissions. Dr Sun displayed a map showing the location and type of the many shipping accidents or incidents that have taken place in the Arctic in recent years. She then outlined the types and number of vessels that have recently transited the northern sea route (NSR), the most used passage through the Arctic, to show that very few full transits take place. Most shipping is instead destinational. Dr Sun then turned to discuss the framework for the regulation of Arctic shipping, which, as was recognised by the Arctic coastal states in the 2008 Ilulissat Declaration, is UNCLOS. The general rules apportioning jurisdiction under UNCLOS apply to the Arctic as they do in every other ocean, however the Arctic has a specific provision in Article 234. This article provides coastal states, if a series of conditions are met, with jurisdiction to adopt and enforce unilateral laws and regulations to prevent, reduce and control vessel-source pollution in ice-covered areas. Canada and Russia have both used article 234 to adopt such regulations, including mandatory reporting systems, the requirement of a permit to transit, and somewhat controversially a requirement that ships use Russian icebreakers through the NSR. As national laws however these regulations have limitations such as being open to challenge by other states, lack of global consistency and they apply only within the EEZ and territorial sea.

The IMO as the competent international organisation for shipping has adopted numerous major global instruments such as SOLAS,¹ MARPOL² and the STCW convention³ that all apply in the Arctic. Additionally, since the early 1990s the IMO has been active in preparing special rules for the Arctic (and Antarctica) reflecting the particular vulnerability of the region and the risks that it poses to, and that are posed by, shipping. From the 2002 IMO Guidelines for Ships Operating in Arctic Ice-Covered Waters there has been a gradual expansion in the development of regulations, leading to the 2009 IMO Guidelines for Ships Operating in Polar Waters and finally the mandatory Polar Code adopted in 2014-15 and 2016. The Polar Code generally applies in waters above 60°N, with deviations to include the south coast of Greenland and to avoid the warmer waters near Iceland and mainland Norway. It generally applies to ships subject to SOLAS/MARPOL whilst in those waters engaged on international voyages. The Polar Code is holistic, goal-oriented and risk-based and includes mandatory and recommendatory measures on safety, pollution prevention and training and qualification. National regulations adopted under Article 234 are widely considered to continue to operate despite the introduction of the Polar Code. The Polar Code represents significant progress towards the goal of safe and sustainable Arctic shipping however there is further work to be done both in terms of implementation and adoption of further rules. The development of further Polar Code regulations is known as 'Phase Two'. Dr Sun highlighted several matters that may be addressed during Phase Two such as extending the application of the Polar Code to non-SOLAS vessels and vessels engaged in domestic voyages, area-based management tools, specific regulations for the use of antifouling paints and ballast water management, and a ban on the use and carriage of heavy fuel oil. A potential ban on heavy fuel oil is a controversial topic as it is the major fuel being used in the Arctic and there are important interests at stake both environmentally and commercially. It remains to be seen how the Polar Code will be reviewed, amended and updated in future to reflect the changing considerations.

During the question and answer session a discussion took place regarding the progress made by the IMO on the regulation of GHG emissions, and the role of the IMO in relation to climate change. A comment was made that considering that both UNCLOS and the UNFCCC designate the IMO as the competent organisation for the regulation of shipping, and that the obligation to make progress on GHG reduction is over 20 years old, perhaps the IMO has not been as effective on this topic as had been suggested. It was agreed that the IMO is challenged by the regulatory challenge, however it was considered important by some that the IMO retain leadership of the issue. Further, the progress that the IMO has made since its initial founding as a consultative organisation was emphasised, with it now considered to be a highly adaptive organisation. It was also suggested that the IMO has been reluctant to apply the precautionary approach, and has been absent from the BBNJ negotiations. It was agreed that precautionary measures are a major challenge for the IMO, and particularly for the GHG issue

¹ International Convention for the Safety of Life at Sea, opened for signature 1 November 1974, 1184 UNTS 1 (entered into force 25 May 1980).

² International Convention for the Prevention of Pollution from Ships (as Modified by the Protocol of 1978 Relating Thereto), opened for signature 2 November 1973, 1340 UNTS 184 (entered into force 2 October 1983).

³ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, opened for signature 7 July 1978, 1361 UNTS 190 (entered into force 28 April 1984).

as there is a high degree of uncertainty which is hard to reconcile with ship financing and the need for long term clarity. It was questioned whether, considering the comparative progress made by the aviation industry, the shipping industry is more challenging to regulate. However comments were made to the contrary that the aviation industry has adopted a market based mechanism that only exports the problem. A comment was made that there is a demarcation between what the IMO is for and what we can reasonably expect from it, and what other bodies are perhaps better placed to deal with this issue. However the point was made that the IMO is essentially its member states, which are also party to the other relevant agreements, and may have different positions depending on the forum. The international community has competing interests.

Regarding the regulatory regime for Arctic shipping, it was questioned why the Arctic states are adopting separate instruments rather than adopting them through the IMO, such as the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic and the 2011 Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic. It was suggested that these instruments, which are not Arctic Council instruments but merely adopted under its auspices as multilateral agreements, are Arctic-specific and focused on cooperation, and therefore it is appropriate to limit them to the Arctic. The regulations adopted under Article 234 were also discussed, particularly in relation to the issue of lack of transparency such as regarding the decision of how much to charge ships to pass through the NSR and which ships require icebreaking assistance.

The discussions in the IMO regarding whether to pursue aspirations or targets were considered by the participants and speakers. The question at the IMO is regarding what the level of commitment should be to the long term goal that is adopted, essentially should there be a carbon neutrality target or merely aspiration? The question of possible uneven impacts on geographically distant developing states, in terms of increased costs, was also considered. A possible solution would be to use the income from a potential levy to assist the disproportionately affected states, and there has been no opposition to this at the IMO to date.

Panel 6 – Living Marine Resources, Marine Environment and Climate Change

Professor Ronán Long from the Global Ocean Institute at the World Maritime University gave a presentation on 'Due Diligence, Climate Mitigation Measures, the Law of the Sea and the Paris Agreement'. Professor Long first addressed the question of what is the content of the obligation of due diligence to protect and preserve the marine environment. At a basic level it is an obligation of conduct, not result, and the conduct of a responsible citizen or government. The ILA Study Group on Due Diligence in its second report in 2016 stated that due diligence is a standard of care against which fault may be assessed. It is a standard of reasonable care and can refer to an act or omission. Professor Long stated that due diligence is a key component of the obligation to prevent harm in international environmental law, as espoused in the ICJ *Pulp Mills* decision. The obligation of due diligence was substantially developed in the International Tribunal for the Law of the Sea (ITLOS) Seabed Disputes Chamber Advisory Opinion, when the Chamber held that due diligence is an obligation on states to ensure that actors under their jurisdiction and control comply with their obligations to protect the marine environment. The obligation 'to ensure' is not one of result but one of conduct and due diligence, with states obliged to deploy adequate means, to exercise best possible efforts, to do the utmost, to obtain this result. Professor Long then outlined the attributes of due diligence. The context of the obligation matters enormously and can vary over time, the obligation is relative to the risk, and the precautionary approach is integral. The obligation is supplemented by the requirement to deploy best environmental practices including EIA. In the context of deep seabed mining, the general provisions on responsibility and liability apply equally to all sponsoring states whether developed or developing. A state is only liable if it failed to carry out due diligence. The full bench of ITLOS gave an Advisory Opinion on the obligations of flag states regarding prevention of illegal, unreported and unregulated (IUU) fishing four years after the Seabed Advisory Opinion. In that Opinion the Tribunal found that the obligation of flag states to ensure that their vessels are not engaged in IUU fishing is an obligation of due diligence, and that the duty to cooperate is a general rule of international law. Agreeing with the Seabed Disputes Chamber, the Tribunal found that the liability of the flag state arises from a failure to comply with due diligence obligations. In the South China Sea Award, the arbitral tribunal found that due diligence is informed by other rules of international law, and requires not only adoption of appropriate rules and measures, but also enforcement and the exercise of administrative control.

The second question addressed by Professor Long was whether the requirement of due diligence under UNCLOS creates an obligation to mitigate the adverse impacts of climate change on the marine environment. A related question was, how can we use UNCLOS to advance the climate change agenda? Professor Long, agreeing with earlier discussions, stated that it is now widely accepted that the definition of marine pollution in Article 1 of UNCLOS is wide enough to cover greenhouse gas emissions. The general obligation in Article 194 of UNCLOS to take all measures to prevent, reduce and control pollution of marine environment from any source is one of due diligence, and includes the obligation in Article 194(5) to protect rare or fragile ecosystems such as coral reefs. There are many articles in Part XII of UNCLOS relevant to climate change in addition to the general obligations, such as Article 207 on land-

based sources of pollution and Article 212 on pollution through the atmosphere. Professor Long stated that the applicable rules of international law with respect to GHG marine pollution would be the UNFCCC objective of stabilisation of GHG in the atmosphere. The objectives under the Paris Agreement to hold global temperatures to well below 2°C and make efforts to limit to 1.5°C and to pursue domestic mitigation measures also apply. Professor Long then considered what the UNCLOS due diligence obligations require in relation to mitigation measures. The standard of conduct is very general under Articles 194 and 212, and the question is whether Part XII requires states to take measures beyond what is required by the Paris Agreement. Such an argument, of attempting to hold a state responsible to a higher standard under UNCLOS than under a subsequent agreement between the parties, was rejected in the *MOX Plant* case and may be unlikely to succeed. Further, attempting to enforce obligations stricter than the Paris Agreement would mean overcoming sustainable development and sovereign rights over natural resource arguments. However, Professor Long noted that due diligence is a variable concept and the obligations may vary over time with new scientific knowledge and technology, and that domestic mitigation measures will be assessed against the overall goal in the Global Stocktake. He concluded stating that much depends on how far states go to adopt specific measures pertaining to climate change and the ocean.

Finally Professor Long discussed the question of the legal duties to restore the marine environment, by referring to the numerous legal instruments and cases that impose obligations to restore the environment such as in the CBD,⁴ OSPAR,⁵ CMS⁶, the Fish Stocks Agreement and UNCLOS. He highlighted the recent decision of the ICJ in *Costa Rica v Nicaragua*, in which the Court awarded compensation to indemnify for the impairment or loss of environmental goods and services and payment for the restoration of the damaged environment. The judgment recognised that natural recovery may not always be able to restore the environment to its previous state and therefore payment to enable active restoration may be awarded. The Court found that international law does not prescribe any specific method of valuation. Professor Long also discussed the role of the BBNJ ILBI in providing for ecological restoration, particularly in relation to area-based management tools, EIAs and strategic environmental assessments (SEAs), and liability and compliance. Professor Long concluded by stating that in order to demonstrate that it has acted diligently, a state must at least minimise the risk of significant damage to the marine environment from climate change. All states must take measures that are reasonably appropriate in respect of the marine environment to meet climate change obligations. Finally he raised the possibility of dispute settlement under UNCLOS, and suggested that there may be considerable scope for an advisory opinion on this topic.

⁴ Convention on Biological Diversity, opened for signature 5 June 1992, 1760 UNTS 79 (entered into force 29 December 1993).

⁵ Convention for the Protection of the Marine Environment of the North-East Atlantic, opened for signature 22 September 1992, 2354 UNTS 67 (entered into force 25 March 1998).

⁶ Convention on the Conservation of Migratory Species of Wild Animals, opened for signature 23 June 1979, 1651 UNTS 333 (entered into force 1 November 1983).

Professor Johann Bell from Conservation International and ANCORS at the University of Wollongong gave a presentation on 'Addressing the Effects of Climate Change on Fisheries', with a particular focus on the Pacific island region. He began by introducing the global evidence to show that climate change is having effects on fisheries. The Pacific island region depends on fish for food security more than anywhere else in the world, and most fishing effort is for subsistence. Many people in the region depend on fish for jobs, particularly tuna, such as in processing tuna, working on tuna vessels or helping to manage tropical tuna fisheries. The selling of licences to distant water fishers is also a major source of government revenue for Pacific island states, representing for example 63-84% of Kiribati's government revenue. Professor Bell stated that the eight Pacific island states have established an effective collective management system that is based on the number of vessels and days each country may fish rather than a fishing quota scheme. Having a collective management system means that regardless of where the fish are caught, everyone benefits. It also means that fish that move due to ocean currents can remain within the same scheme. Collective management has also led to increased licence fees, and Professor Bell considers that the system has managed to achieve very good sustainable and economic benefits. He then addressed how climate change could affect the system and the plans that have been put in place to manage the Pacific island fisheries. Over time skipjack tuna is moving further to the east, and there will be a greater proportion of tuna on the high seas which will mean a loss of revenue from the sale of fishing licences. It will also mean that onshore related industries such as canneries will lose business. In terms of implications of climate change for food security, most of the fish that the population of Pacific island nations eat comes from coastal coral reef fisheries. Increased coral bleaching will lead to reduced production of reef fish, and tuna will have to fill the gap for domestic food security. Professor Bell outlined the investments that will be required to inform adaptation measures, such as the need to map and identify the spatial stock structure and the need to separate modelling for each separate population. The creation of large MPAs could be a potential adaptation measure, however would be dependent on obtaining information on the stock to be protected. Practical adaptation solutions suggested by Professor Bell include adding value to tuna products through different preparation methods, distributing small tuna from transshipping operations in urban centres, and transferring some of the fishing effort in coastal communities from coral reefs to tuna.

Ms Youna Lyons from CIL gave a presentation on 'Protecting Coral Reefs and other Sensitive Marine Areas from the Impacts of Climate Change and Ocean Acidification'. She began by introducing the concept of resilience through the example of the 1755 Lisbon earthquake, tsunami and fires, which would not have caused so much damage if the city had been planned better. She defined resilience as 'the magnitude of the disturbance that a system can absorb without fundamentally changing', and raised the question of whether the international legal framework is supporting resilience building of sensitive areas. There are many legally adopted scientific criteria for the identification of sensitive marine areas, with Ms Lyons focussing on those adopted under conservation instruments and instruments relating to sea uses. Criteria developed with a conservation focus include wetlands of international importance under the Ramsar Convention, including 44 coastal and marine sites in Asia, UNESCO World Cultural and Natural Heritage sites, including 22 marine and coastal sites in the Asia-Pacific, and

Ecologically or Biologically Sensitive Areas under the CBD. There are 55 marine migratory species in the South China Sea listed under the Convention on Migratory Species. Scientific criteria developed in the context of agreements for sea uses include special areas under MARPOL, Particularly Sensitive Sea Areas under the IMO, Vulnerable Marine Ecosystems under the UN Food and Agriculture Organisation, and Areas of Particular Environmental Interest under the International Seabed Authority.

Ms Lyons then identified the criteria that are generally shared across legally developed sets of criteria. These include areas that are unique or rare, that support critical life-history stages, that contain habitat of threatened, endangered or declining species, that contain sensitive habitats or fragile species, that contain high diversity, that have a high degree of naturalness or ecological integrity, and also the biological productivity of an area or its ability to support large aggregations. Criteria less commonly shared across sets of criteria include representativeness, connectivity, refugia, geomorphological importance and structural integrity. Ms Lyons emphasised the importance of refugia, which protect species from climate change by serving as a refuge in times of environmental stress. Turning to consider the legal aspects of these criteria, Ms Lyons discussed how the legal status of other criteria can be increased, as some criteria have a greater legitimacy from an international legal perspective. There is abundant scientific literature on desirable ecological criteria, however very little focusing primarily on legally defined scientific criteria. In order to be successful it is important that scientific proposals for criteria take into account the existing political and legal consensus. Ms Lyons then outlined the obligations of states under each instrument, with identification of sensitive areas an explicit obligation under some but not all instruments. Most conservation-driven instruments include an obligation to monitor impacts in these areas and also an obligation to report. The status of the area may be lost if activities interfere with its characteristics. Finally Ms Lyons discussed the obligations of states under UNCLOS with respect to protecting sensitive marine areas. UNCLOS applies to all components of the marine environment, and its obligations are informed by and interpreted with reference to other international legal instruments, such as those earlier discussed by Ms Lyons. For example, other instruments can inform the obligation in Article 194(5) to protect rare or fragile ecosystems and the habitat of depleted, threatened or endangered species, as well as the content of the due diligence environmental obligations discussed earlier by Professor Long. With its binding dispute resolution system and customary law status, UNCLOS can provide the teeth to the scientific criteria adopted under other instruments. Ms Lyons concluded with some recommendations, suggesting that we work with the existing legal framework (in addition to the new ILBI), that missing criteria be identified or changes made to criteria where needed to account for climate change and to build resilience, and finally that more areas in Southeast Asia that meet the criteria should be identified.

During the discussion session a major topic was the relationship between UNCLOS and the Paris Agreement, and how the Paris Agreement can be read into the UNCLOS Part XII obligations. The fundamental question was asked of whether the Paris Agreement obligations are obligations of conduct or result, and whether it is the temperature goal or the national mitigation measures that is relevant in the UNCLOS context. It was agreed that UNCLOS obligations are obligations of conduct, and also that the Paris Agreement has a results-based

temperature objective. The point was made that the Paris Agreement was intended to be a bottom-up approach based on NDCs. On the reading of one participant, the obligation in the Paris Agreement is to prepare an NDC and achieve its objective, not to achieve the temperature goal. A comment was made regarding how to identify the standard of care in the context of UNCLOS and the Paris Agreement and climate change due diligence obligations. Looking at the standard of care in light of the Paris Agreement, and in the context of reasonableness, does common but differentiated responsibility become imported into the Paris Agreement? It was considered that the standard would be reasonable, appropriate care. It was also noted that the Seabed Disputes Chamber in its Advisory Opinion found that capacity is not a justification for weaker obligations in the context of deep seabed mining. The more sensitive the area, the riskier the activity and the higher the standard of care. However, some participants considered that the seabed context is different. The Paris framework of NDCs was considered to be quite problematic by some in terms of the application of the due diligence principle by courts and tribunals. Some also considered that the Paris Agreement could perhaps undermine the UNCLOS standards, as both advisory opinions and the South China Sea Award were clear on the content of the UNCLOS Part XII obligations. While some thought that perhaps it would have been better to have Kyoto style targets rather than the NDCs, it was mentioned that Paris had succeeded in obtaining ratifications at a level that Kyoto had failed to, and that if the Kyoto approach had been taken again, Paris may not have been successful at all.

Another issue was how would responsibility or liability be apportioned in the event that the 2°C temperature limit is exceeded. It was asked whether, considering that the Paris Agreement seeks to limit warming to within 2°C, whether it is implied that a certain amount of harm to the marine environment has been accepted by the international community? And further, how does that influence how we interpret UNCLOS obligations such as Article 192 and how we define pollution of the marine environment? The panellists were asked about the harm caused to the environment in the context of a 1.5°C rise compared to now, and then the harm caused to the environment in the 2°C scenario compared to the 1.5°C scenario. It was agreed that there would be widespread degradation whether the temperature rises by 1.5°C or 2°C, and also that one cannot separate harm due to temperature from harm caused by other activities. The use of an average temperature rise measurement at all was considered deficient, as temperature rise will vary globally and an average temperature rise is not an accurate indication of global climate change. The atmospheric temperature measurement was described as only a proxy for climate change and a bad one at that. Measuring CO₂ was considered to be a better option, however it was acknowledged that the world reacts more to temperature rise than other measurements.

Panel 7 – Development and Adaptation of UNCLOS to Address the Impacts of Climate Change

Professor Alan Boyle of Essex Court Chambers gave a presentation on ‘Addressing Climate Change Impacts through UNCLOS Part XV Dispute Settlement Mechanisms’. He began by introducing the value of litigation. He stated that litigation can have a transformative effect by strengthening the hand of weak states and may put pressure on UNCLOS parties to deliver on their climate change obligations. However he cautioned that litigation can be politically difficult and expensive, and that it is risky as the applicant may lose. Professor Boyle outlined the three types of possible cases, being non-compliance with UNCLOS pollution control obligations, non-cooperation as required by UNCLOS, or damage to a coastal state caused by a violation of UNCLOS obligations. Regarding the threshold question of whether climate change is marine pollution as defined in UNCLOS, Professor Boyle considered that it clearly is, either in the form of direct introduction of CO₂ as a ‘substance’ into the oceans or as ‘energy’ due to temperature increase. He also concluded that there is an abundance of scientific evidence to establish deleterious effects from either the direct or indirect effects of GHG emissions. Professor Boyle then outlined the relevant obligations in UNCLOS, already discussed by other presenters, including Articles 192, 194, 207 and 212. He stated that there is no doubt that UNCLOS deals with marine pollution coming from the air, and that it does not matter which of these provisions is relied on to found a case. Articles 207 and 212 require states, in adopting laws and regulations to prevent, reduce and control pollution, to take into account internationally agreed rules, standards and recommended practice and procedures. In the climate change context, the internationally agreed rules and standards are found in the Paris Agreement, and therefore Professor Boyle concluded that UNCLOS requires states to comply with the Paris Agreement. The fundamental duty of cooperation is also interpreted in the context of the Paris Agreement, so that parties must cooperate to implement the Paris Agreement.

Having identified the content of the UNCLOS climate change obligations, Professor Boyle turned to apply the UNCLOS Part XV system. An issue arises concerning whether an UNCLOS climate change case would in fact be a dispute concerning the interpretation or application of UNCLOS or whether it would be more properly characterised as a UNFCCC case. Professor Boyle stated that there would be a case under both UNCLOS and the UNFCCC, and therefore the question is which case prevails. There is no compulsory dispute settlement jurisdiction under the UNFCCC and therefore the UNCLOS dispute settlement system is comparatively attractive. Following the approach taken by the South China Sea arbitral tribunal, only an express agreement excludes the jurisdiction of UNCLOS Part XV, and provided that the case is pleaded as an UNCLOS case, an UNCLOS court or tribunal has jurisdiction to hear the case. A violation of UNCLOS could be argued by reference to the Paris Agreement, which is in accordance with Part XII’s expectation that its obligations be interpreted and applied in accordance with other instruments. Professor Boyle identified two further issues, first the need to establish that a dispute exists, and second the question of whether it is necessary to sue all GHG emitting parties. These issues arose in the recent cases initiated by the Marshall

Islands at the ICJ, where there was found to be no dispute between the various parties prior to the commencement of the case. Further Judge Tomka in the case against the United Kingdom concluded that the obligations the subject of the proceedings were not of a bilateral nature between the Marshall Islands and the UK, as there were many other states whose conduct was the same as that of the UK. Similar issues could arise in the context of a climate change dispute.

Under UNCLOS there is a choice of forum, with ad hoc arbitration being the default option. Most developing states have opted by default for ad hoc arbitration, which presents issues as it is more expensive than a standing court or tribunal, and each party has the right to appoint an arbitrator, meaning that there could potentially be a large number of arbitrators. Although the ICJ or ITLOS would be a better option for a case with multiple respondents, ad hoc arbitration due to its default status is likely to be the only realistic option unless the parties agree to a transfer. On the question of who would be able to initiate the proceedings, Professor Boyle stated that the obligations in UNCLOS Part XII are *erga omnes* and therefore any party can sue. Finally turning to remedies, Professor Boyle identified options including negotiation, restitution, or the most useful outcome of an order to comply with the obligations. Regarding the potential for damages, Professor Boyle considered that there would be multiple problems, such as joint responsibility, proving causation and proving damage. He also stated that potentially it would only be damage caused beyond a 1.5°C temperature rise that would be relevant. Professor Boyle ended by concluding that UNCLOS Part XV would provide a compulsory mechanism for a climate change case and would not be trumped by the UNFCCC if pleaded properly. A case alleging non-compliance with UNCLOS climate change obligations would likely be the best option, with a non-cooperation case likely to be without practical utility.

Professor Catherine Redgwell of the University of Oxford gave a presentation on 'Treaty Evolution, Adaptation and Change: Is UNCLOS 'enough' to address Climate Change Impacts on the Oceans?' In her presentation Professor Redgwell recognised the central role of UNCLOS in addressing impacts and consequences of sea level rise, warming and acidification. She described UNCLOS' provisions as ambulatory and capable of dynamically evolving. Complemented by an array of other instruments, UNCLOS does not stand in isolation. Professor Redgwell began by briefly outlining the relevant UNCLOS provisions including Articles 192 and 194 and the definition of marine pollution in Article 1. Like the other speakers she concluded that climate change is clearly marine pollution. The obligations in UNCLOS Part XII must be read in light of external rules and standards. For provisions such as 207 and 212, the benchmark is very weak, with states only required to take into account external rules and standards. For Article 211 the benchmark is much stronger as the laws must have at least the same effect as the international rules and standards. Further, for example in the context of pollution from land-based sources (Article 207), the benchmark is meaningless as there are no generally accepted international rules and standards to take into account at all. For Article 212 (pollution through or from the atmosphere) the independent source of the legal obligation, whether or not the UNCLOS party is party to it, would be the UNFCCC or the Paris Agreement. Compliance with the UNFCCC and Paris Agreement is relevant for the interpretation and application of Article 212. Professor Redgwell stated that the NDC

obligation in the Paris Agreement is one of conduct, but the temperature goal is one of result. On the other hand the NDCs and compliance with them is clearly tied to each state, whereas the temperature target is more difficult to extrapolate in terms of individual obligations. Professor Redgwell stated that perhaps the global stocktaking may lead to a merging of the two different situations.

Professor Redgwell then highlighted several examples of environmental developments linked to Part XII of UNCLOS that directly or indirectly serve to mitigate climate change impacts. The Polar Code was adopted to address the effects of international shipping, however indirectly it is reducing stressors on vulnerable ecosystems. PSSAs designated by the IMO are contributing to adaptation and enhance resilience, and are linked to the obligation in Article 194(5) relating to rare and fragile ecosystems. The establishment of MPAs more generally can be considered as an important measure to enhance resilience of marine ecosystems. Area-based management tools including MPAs and also EIAs could be a significant tool to emerge from the BBNJ negotiations. Professor Redgwell then discussed the development of the law of the sea outside of UNCLOS, including through the UN General Assembly annual review of the state of the oceans and the law of the sea, with its annual resolution reiterating concerns over current and projected climate change. The UN plays a catalytic role in raising awareness of the impact of climate change on the oceans, as a global forum for law of the sea issues as a surrogate for a regular UNCLOS COP, and through dynamic evolution of UNCLOS such as the adoption of the 1994 Implementing Agreement and the BBNJ negotiations. Professor Redgwell also discussed the ongoing work of the ILA Sea Level Rise Committee that had been discussed by earlier presenters. She outlined the possible mechanisms to respond to the issue of climate change and the oceans such as development of customary international law, a new protocol to the UNFCCC, an amendment of UNCLOS or a decision of the UNCLOS states parties. She stated that other treaty instruments can be influential in their own right such as the CBD, including the decision of its COP on the designation of MPAs as a strategy to adapt to climate change. Professor Redgwell concluded by stating that UNCLOS is central to the regulation of the impact of climate change on the oceans but it is not enough. External rules and standards can be brought within UNCLOS given its inclusive language to effectively regulate for climate change mitigation and adaptation.

During the discussion session the point was made that although UNCLOS has long been read by reference to other instruments, it would represent a quantum leap to read in the substantive Paris Agreement obligation directly into UNCLOS as an obligation enforceable under Part XV compulsory procedures. A comment was made on the need for UNCLOS states parties to revisit their dispute settlement choice under UNCLOS so that they are cognisant of the choice that they have made and its implications. The idea of using special chambers as a more cost-effective option than ad hoc arbitration was also mentioned. The practical question of whether states would in practice bring a case such as this to an international court or tribunal was also raised. It was acknowledged that in many situations an UNCLOS climate change case would involve the applicant suing a state that they do not want to sue due to political or other reasons.

Regarding the issue of obligations of conduct in UNCLOS and obligations of result in the Paris Agreement, it was not considered to necessarily be an issue, as although UNCLOS is fundamentally conduct-based there are some result-based obligations such as the prohibition on dumping. The question is how to identify the obligation, and whether the UNCLOS and Paris Agreement obligations are different. The point was raised that at a 1.5°C temperature rise we are not 'protecting and preserving the marine environment', however the international community at the Paris Conference has accepted this increase. In *MOX Plant* the court did not accept the argument that UNCLOS meant stricter obligations than had been agreed to under OSPAR, and a similar outcome was reached in the *Pulp Mills* case. The possibility of suing under UNCLOS procedural obligations such as EIAs, rather than substantive obligations, was raised as a greater avenue towards success or awareness, and potentially a way around the relationship between UNCLOS and the Paris Agreement.

The prospect of incorporating regional agreements on climate change into UNCLOS was discussed, with no barrier identified for doing so. Regarding the work of the ILA Sea Level Rise Committee, comments were made about whether rules in UNCLOS on the EEZ and territorial sea that are recognised to be customary norms will evolve to reflect the new reality. The question was asked how important the breadth of those zones is to the customary rule. The option of organic evolution of UNCLOS by practice or interpretation as a middle ground rather than seeking to establish a new general or regional customary rule was suggested. Pursuant to Article 311(3) a new agreement on baselines could be concluded on a regional level provided that the rights of third states are not affected. However it was also commented that it is clearly undesirable to have different rules on something as fundamental as baselines.

Panel 8 – Regional Cooperation as a Pathway Forward

On the final panel of the conference Ambassador Arif Havas Oegroseno, Deputy Coordinating Minister for Maritime Affairs gave a presentation on 'Regional Cooperation or Initiative to Address Climate Change'. He began by introducing the Southeast Asian context as a maritime region largely covered by water and the global centre of marine biodiversity. He then outlined the threats of climate change to the region, including rising sea level and temperature, coral bleaching, ocean acidification, extreme weather events, displacement of people and economic activities, and the costs of adaptation and mitigation. ASEAN is one of the regions most at risk from climate change impacts. Ambassador Oegroseno stated that Indonesia is already losing land territory due to sea level rise, and the government is actively pursuing adaptation measures. Communities have already been required to move as their villages become uninhabitable. Impacts will also be suffered by the fishing industry in Southeast Asia, with a significant decline in revenue expected. Although tuna fisheries are expanding into Indonesia, there is currently insufficient cold storage to take advantage of the opportunity. Regarding cooperation in ASEAN on climate change, all ASEAN members are party to the Paris Agreement, and there is an ASEAN working group on climate change to oversee the ASEAN action plan. However to date these measures have focused on forestry due to the portfolios with responsibility for the issue. Ambassador Oegroseno highlighted the Coral Triangle Initiative as a possibility for cooperation on climate adaptation, such as through the adoption of MPAs, promotion of blue carbon and promotion of sustainable fisheries and food security. The key initiatives being pursued in Indonesia include a blue carbon initiative on coral reef, mangrove and sea grass restoration, cooperation through the Archipelagic and Island States Forum, and the development of a regional plan of action of marine plastic debris. Ambassador Oegroseno stated that Southeast Asia has rich blue carbon resources as it is home to 35% of the world's mangroves and has the highest seagrass diversity in the world. Despite these rich reserves there has not yet been proper accounting to determine its value. The World Bank is supporting Indonesian action on blue carbon, with potential key activities including mapping of the actual condition of blue carbon, calculating blue carbon ecosystem services, blue carbon restoration and incorporation of blue carbon preservation and protection into the Indonesian NDC on adaptation/mitigation.

Ambassador Oegroseno also highlighted the Archipelagic and Island States Forum which includes over 50 archipelagic and island states that are facing common challenges from climate change. It aims to serve as a catalyst that translates challenges and opportunities. It will be supported by the establishment of a trust fund to facilitate projects relating to climate change. Marine plastic debris is another serious threat facing Indonesia and Southeast Asia, which intensifies the adverse effects of climate change. Indonesia has developed a national plan of action to reduce plastic debris by 2025 and in doing so will increase the resilience of the marine environment. Ambassador Oegroseno concluded by discussing the potential of regional cooperation for marine environment protection in Southeast Asia in relation to land based pollution, sea based pollution and pollution from offshore platforms.

During the question and answer session after Ambassador Oegroseno's presentation there was a discussion about the advantages of international cooperation for the marine environment without regard to national boundaries. The threats facing the marine environment are not confined to within national boundaries and therefore states within a region can be more effective to protect their common interests when they cooperate. Ambassador Oegroseno used the example of tuna and other living resources in Asia-Pacific region, and highlighted the importance of protecting the natural habits of these living resources, such as coral reefs. The possibilities for further integration of the oceans into the international climate change regime were also discussed. It was suggested that the oceans were more prominent at the Bonn COP 23 discussions than they were at the Paris Agreement negotiations and that there could be potential to increase the focus on oceans through that avenue. The possibility of utilising the Green Climate Fund for the initiatives in SEA was also discussed. Ambassador Oegroseno indicated that as the GCF alone is not sufficient, Indonesia is exploring alternative financing resources, such as private foreign investment. Indonesia's practical efforts to protect the marine environment were also discussed, such as addressing land-based pollution, proposing the adoption of IMO routing or discharge measures, preparing guidelines on a sub-regional level for preventing pollution from offshore platforms, and developing reception facilities on Bintan and Batam and other centres for shipping. The role of existing and potential future ASEAN bodies on climate change and marine biodiversity was highlighted. Ambassador Oegroseno also explained Indonesia's practice of addressing social and legal issues associated with internal migration due to the loss of land after natural disasters.

The final speaker of the conference was Mr Clark Peteru, of the Secretariat of the Pacific Regional Environment Programme. Mr Peteru gave a presentation on 'Regionalism in the Pacific – Perspectives from SPREP'. He began by introducing the climate change impacts of most concern to the Pacific region, namely sea level rise, increased temperatures in sea and on land, more highly intense weather events, changes in rainfall patterns and ocean acidification. Although the Pacific states are recognised as being highly vulnerable to climate change, Mr Peteru emphasised that within the region different states and people will be affected to different degrees. He stated that these varying impacts must be addressed when considering appropriate responses to climate change. Mr Peteru outlined the geographical and population contexts of the Pacific island states, with all except for Papua New Guinea having land areas of less than 30,000km² and populations below 1 million. Amongst the Pacific island states there is a wide variation in geographical formation, with some states comprising of atolls both low and high, and others comprised of volcanic islands. There are approximately 200 high islands and 2500 low islands and atolls, and therefore most islands are highly vulnerable to sea level rise. Further, even though some islands may be high, such as volcanic islands, their populations are often concentrated along the low-lying coastline. Considering the small population of each separate state, the Pacific island states have recognised the value of regional organisations to share resources and officials. There are around 10 regional organisations working in the Pacific, with Mr Peteru's organisation, the Secretariat of the Pacific Regional Environment (SPREP), being one. SPREP is based in Samoa and was established in 1993. It provides support to 21 Pacific island states and territories regarding

environmental challenges, and has Australia, France, New Zealand, the UK and the USA as its five metropolitan members. SPREP plays a supporting role in assisting Pacific island states in the UNFCCC process in a variety of ways including negotiations training, policy and legal support and advice, and technical support for mitigation and adaptation projects. SPREP takes its lead from its members' priorities, which for the UNFCCC negotiations are food security, water resources management, and coastal zone protection. Mr Peteru also highlighted several cooperation mechanisms in the Pacific related to climate change, such as the Regional Climate Change Portal, the Regional Technical Support Mechanism, the Climate Change Roundtable and the Pacific Climate Change Centre. The Pacific Climate Change Centre is currently being constructed and will be a centre of excellence on climate change research funded by Japan and Samoa. Mr Peteru concluded by raising the two international law issues of most interest or concern to his organisation, being the ambulatory nature of baselines and the ramifications for island states, and the question of particular international customary law that was also discussed by Mr Mulalap during the first day of the conference.

During the question and answer session, the role of SPREP as an accredited agency under the UNFCCC Green Climate Fund was discussed. SPREP is a supervisor for funds under the Green Climate Fund and is currently overseeing a project in Vanuatu, with another proposed for the Marshall Islands. The point was also raised that the amount of money in the Fund currently is far below what had been expected to be contributed from the states parties. The possibility of Pacific islands states initiating dispute settlement proceedings under UNCLOS was discussed, however the point was made that in doing so, a state that provides support and resources to the region may be sued, which would be politically undesirable. It was questioned whether despite the numerous organisations operating in the region it is difficult to keep knowledge and resources within the region. Maintaining institutional knowledge was recognised as a problem, however software and technology has helped to prevent loss of knowledge.

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