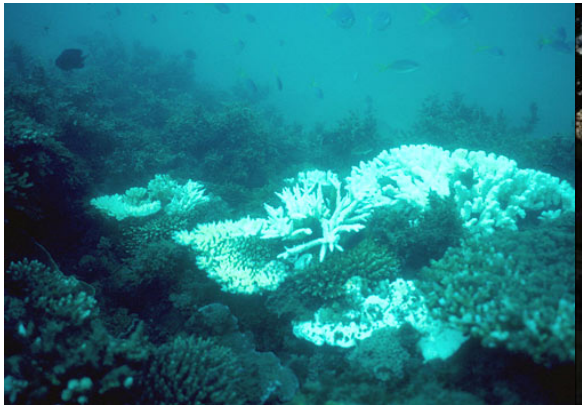
Climate change and ocean acidification in an ocean and law of the sea context



Mr. Vladimir Jares, Deputy Director
Division for Ocean Affairs and the Law of the Sea
Office of Legal Affairs

DIVISION FOR OCEAN AFFAIRS AND THE LAW OF THE SEA
UNITED NATIONS

Outline of Presentation

1. Overview of the impacts
2. Legal and policy frameworks
   I. Relevant United Nations General Assembly resolutions
   II. Legal framework for oceans and seas
   III. Synergies between the law of the sea and the climate change frameworks

Overview of the impacts

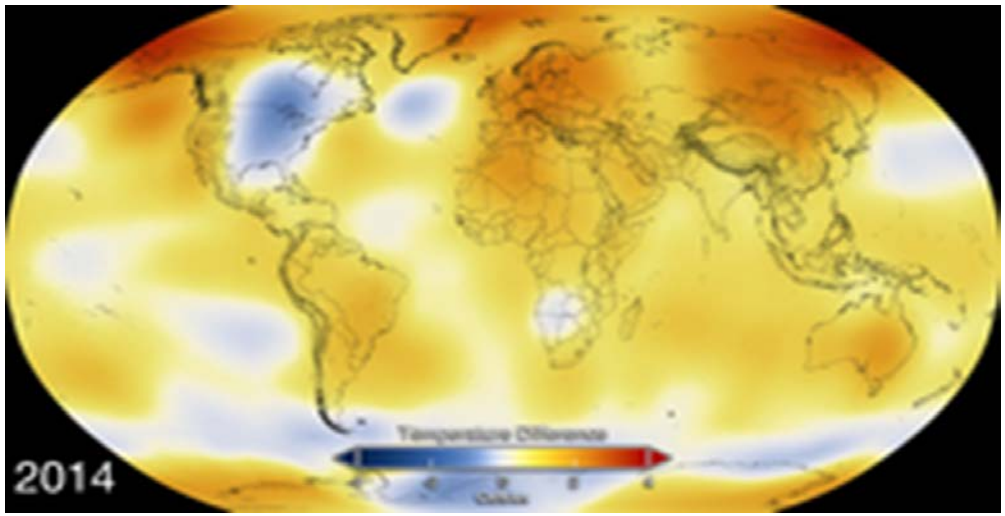
"[…] Sea level rise, loss of polar ice, extreme weather events, ocean warming and ocean acidification are causing, inter alia, destruction of property and loss of lives, changing coastlines, coral bleaching, displacement of fish stocks and ecosystem degradation, all of which affect the food security, livelihood and development of communities."

(*Source: Secretary General's report*)

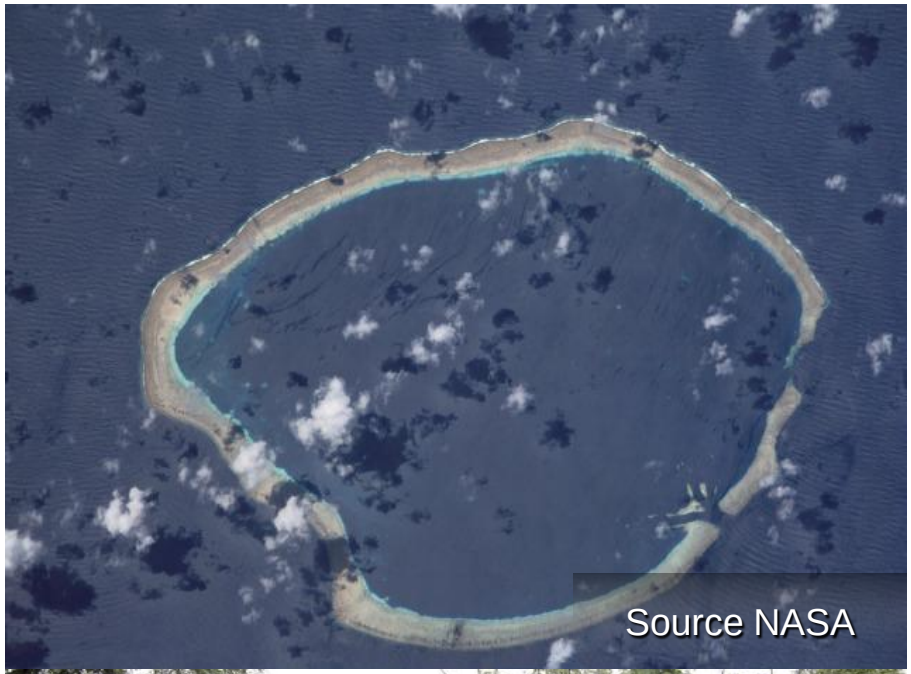
Ocean Warming

- Dominates the increase in energy stored in the climate system, more than 90 % of the energy accumulated between 1971 and 2010

  (Source: IPCC AR5 2013)



Ocean warming → Sea-level rise



- Expansion of the water owing to ocean warming
- Melting of glaciers and ice sheets
- Sea-level rise since the mid-19th century greater than the mean rate during the previous two millennia
- Expectation of a continued rise, exceeding the level observed during the period 1971-2010

(Source: IPCC AR5 2013)

Ocean warming → Marine species redistribution

- Redistribution of marine species and reduction of marine biodiversity in climate change sensitive regions
- Result: challenge for the sustained provision of fisheries productivity and other ecosystem services
  - Effects on fishers, fish farmers and coastal inhabitants
  - Effects on livelihoods and food security
  - Increase of species richness and fisheries catch potential at middle and high latitudes, decrease at tropical latitudes

(Source: IPCC AR5 2013)

Ocean warming → Impacts on marine ecosystems

- Loss of 19% of the original area of coral reefs; serious threat to 15% with loss within the next 10–20 years; and threat of loss of 20% in 20–40 years
- Current rates of climate change - greatest threat to the long-term sustainability of coral reefs and human coastal communities

(Source: GCRMN, Status of the Coral Reefs of the World: 2008)

Ocean warming → Loss of Polar Ice

Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent.

(*Source: IPCC AR5 2013*)

DIVISION FOR OCEAN AFFAIRS AND THE LAW OF THE SEA
UNITED NATIONS

Oceans as carbon sinks

- 30 % of emitted CO2 is absorbed by the oceans
- Example: coastal wetlands (salt marches, mangroves, and sea grass beds)
  - Sequestration of carbon at a rate two to four times greater than mature tropical forests
  - Provision of essential ecosystem services for food security, livelihoods, disaster reduction and adaptation
  - Increasing pressure from coastal development projects
  - Loss of ecosystem services, emission of large quantities of stored CO2
- Possible capital through climate finance mechanisms

Ocean acidification

- Both climate change and ocean acidification are caused by increasing carbon dioxide concentrations in the atmosphere
- Chemical and biological transformations in the oceans through CO2 absorption
- Consequences:
  - Reduction of the chemical capacity of the near-surface ocean to take up more CO2 - down to only 20 % by the end of the twenty-first century
  - Effect on marine organisms - response of calcifying organisms and related loss in food production and livelihoods

Ocean acidification and climate change

Ocean acidification is…

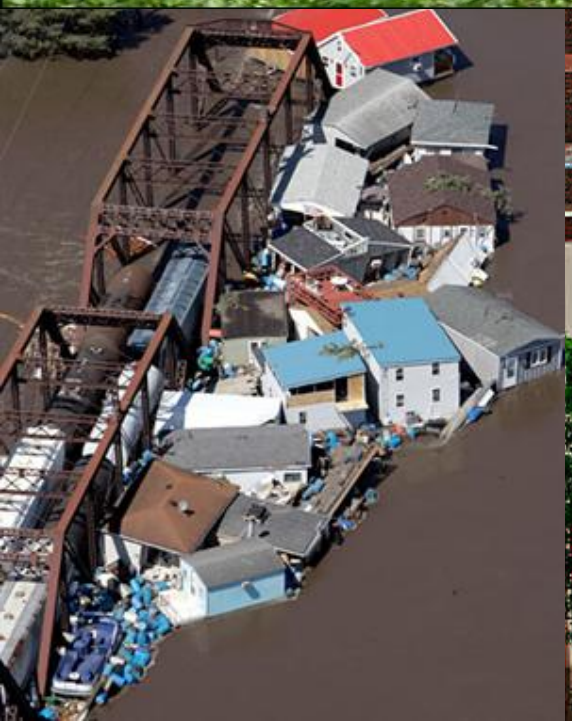
… NOT caused by climate change

… an impact concurrent with the impacts of climate change

… caused by a common root problem: ongoing anthropogenic CO2 emissions

DIVISION FOR OCEAN AFFAIRS AND THE LAW OF THE SEA
UNITED NATIONS

Extreme weather events – linked to surface water temperature



Science and observation

- Need for further coordinated, worldwide information-gathering on the impacts of climate change on oceans and of ocean acidification
- Systematic ocean observation, including monitoring of:
  - Global sea surface temperature
  - Oceanic currents
  - Ocean-based sources and sinks of CO2
  - Sea-surface salinity
  - Sea-level rise
  - Acidification

(Source: GOOS website)

Legal and policy frameworks at the global level

- General Assembly
- UNCLOS
- UNFCCC
- Synergies UNCLOS/UNFCCC
- Other developments

United Nations General Assembly

- Encouraged States to enhance scientific activity to better understand the effects of climate change on the marine environment and marine biodiversity and develop ways and means of adaptation
- Stressed the importance of scientific understanding of oceans/atmosphere interface
- Recognized the importance of raising awareness of the adverse impact of climate change on the marine environment and marine biodiversity
- Called for improved efforts to address coral bleaching

United Nations General Assembly

- **Informal Consultative Process (ICP) in 2013**: addressed ocean acidification
- **The General Assembly in its oceans and law of the sea resolutions**:
  - Encouraged States and competent international organizations and other relevant institutions, individually and in cooperation to:
    1) urgently pursue further research on ocean acidification; and
    2) increase national, regional and global efforts to address levels of ocean acidity and the negative impact of such acidity on vulnerable marine ecosystems, particularly coral reefs
  - Based on findings of the IPCC on ocean acidification, expressed concern over the substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, and the potentially detrimental consequences for fisheries and livelihoods
  - Expressed concern over the increase in the acidity of ocean surface waters since the beginning of the industrial era and urged to make significant efforts to tackle the causes of ocean acidification
  - Urged to enhance the sharing of relevant information

United Nations General Assembly

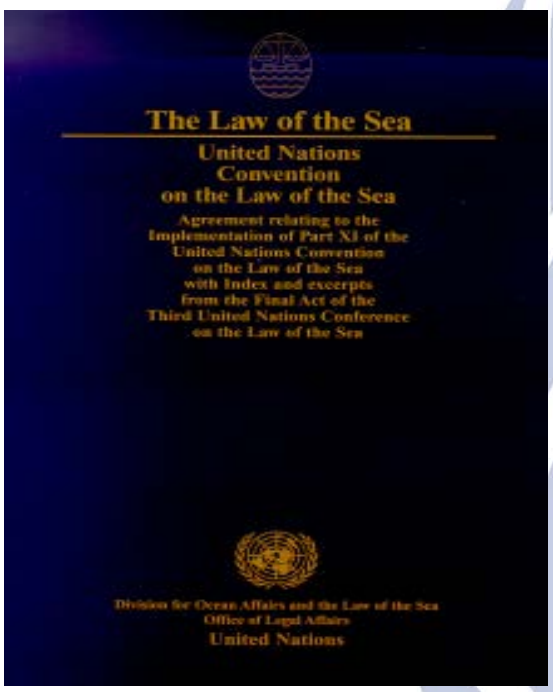
Transforming our world: the 2030 Agenda for Sustainable Development (A/69/L.85, adopted on 25 September 2015)

- Goal 13. Take urgent action to combat climate change and its impacts

- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS sets out the legal framework within which all activities in the oceans and seas must be carried out and is of strategic importance as the basis for national, regional and global action and cooperation in the marine sector, and that its integrity needs to be maintained



UNCLOS and its Implementing Agreements

UNCLOS (10 December 1982): 157 Signatories, 167 Parties; Entry into force on 16 November 1994

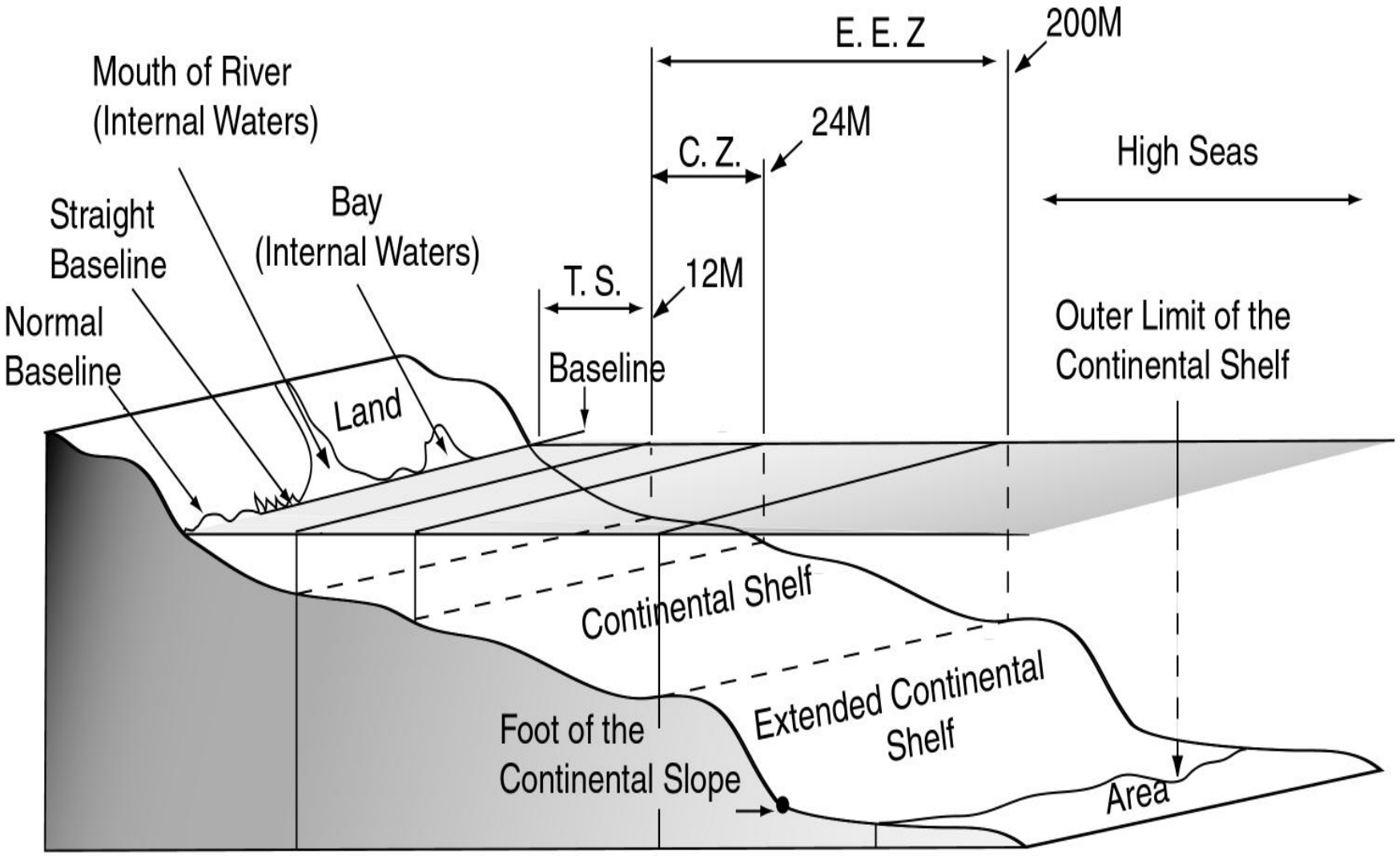
Agreement relating to the implementation of Part XI of UNCLOS (28 July 1994): 79 Signatories, 147 Parties; Entry into force provisionally on 28 July 1996

The United Nations Agreement for the Implementation of the Provisions of UNCLOS relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (4 August 1995): 59 Signatories, 82 Parties; Entry into force 11 December 2001

UNCLOS framework

- Maritime zones
- Coastal States' sovereignty, sovereign rights and jurisdiction in the maritime zones
- Flag States' rights and duties, such as
  - Navigational and overflight rights
  - Right of passage through straits
- Protection of marine environment
- Conservation and management of living marine resources
- Legal status of resources on the seabed beyond the limits of national jurisdiction
- Marine scientific research regime
- Settlement of disputes between States

UNCLOS – maritime zones



UNCLOS - Protection and preservation of the marine environment

Article 1 (4) of UNCLOS:

"Pollution of the marine environment" means the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction amenities.

Protection and preservation of the marine environment

Article 194 of UNCLOS:

- States shall take all measures necessary to prevent, reduce and control pollution of the marine environment from any source
- Sources of pollution
  - Pollution from land-based sources
  - Pollution from or through the atmosphere
  - Pollution by dumping
  - Pollution from vessels
  - Pollution from seabed activities
  - Pollution from other installations and devices operating in the marine environment
  - Pollution from activities in the Area
- The measures shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life

Protection and preservation of the marine environment

- International rules and standards to prevent, reduce and control pollution of the marine environment must be implemented in national legislation either as:
  - Minimum standards (pollution from vessels, dumping, seabed activities, activities in the Area), or
  - Guiding principles (pollution from land-based activities and atmosphere)
- And be subsequently enforced

Protection and preservation of the marine environment

- The indirect **introduction by man of energy into the marine environment**, which drives the increase in energy stored in the oceans and its associated impacts, including ocean warming, sea level rise, marine species redistribution, impacts on ecosystems

"Pollution of the marine environment"

- The indirect introduction of **anthropogenic carbon dioxide into the marine environment**, which causes ocean acidification

"Pollution of the marine environment"

Conservation and management of marine living resources

Impacts of climate change

Conservation and management measures

United Nations Framework Convention on Climate Change (UNFCCC)

Objective – "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system to, *inter alia,* allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened"

(Article 2 and draft negotiating text)

United Nations Framework Convention on Climate Change

UNFCCC

United Nations Framework Convention on Climate Change

Article 4 (d) of the UNFCCC – All Parties are required to "promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems."

Mitigation action aimed at cutting CO^2 and other greenhouse gases emissions and adaptation efforts

Important step in meeting relevant obligations of States under UNCLOS

Implementation of the provision of UNCLOS on the protection and preservation of the marine environment and on the conservation of marine living resources

Important for the achievement of mitigation and adaptation goals, by building resilience to the effects of climate change

Thank you for your attention!