



Sustainable Development of Marine Aquaculture Spatial Planning Component

Spatial Perspectives on Mariculture from a Global Viewpoint

Preliminary Results

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by

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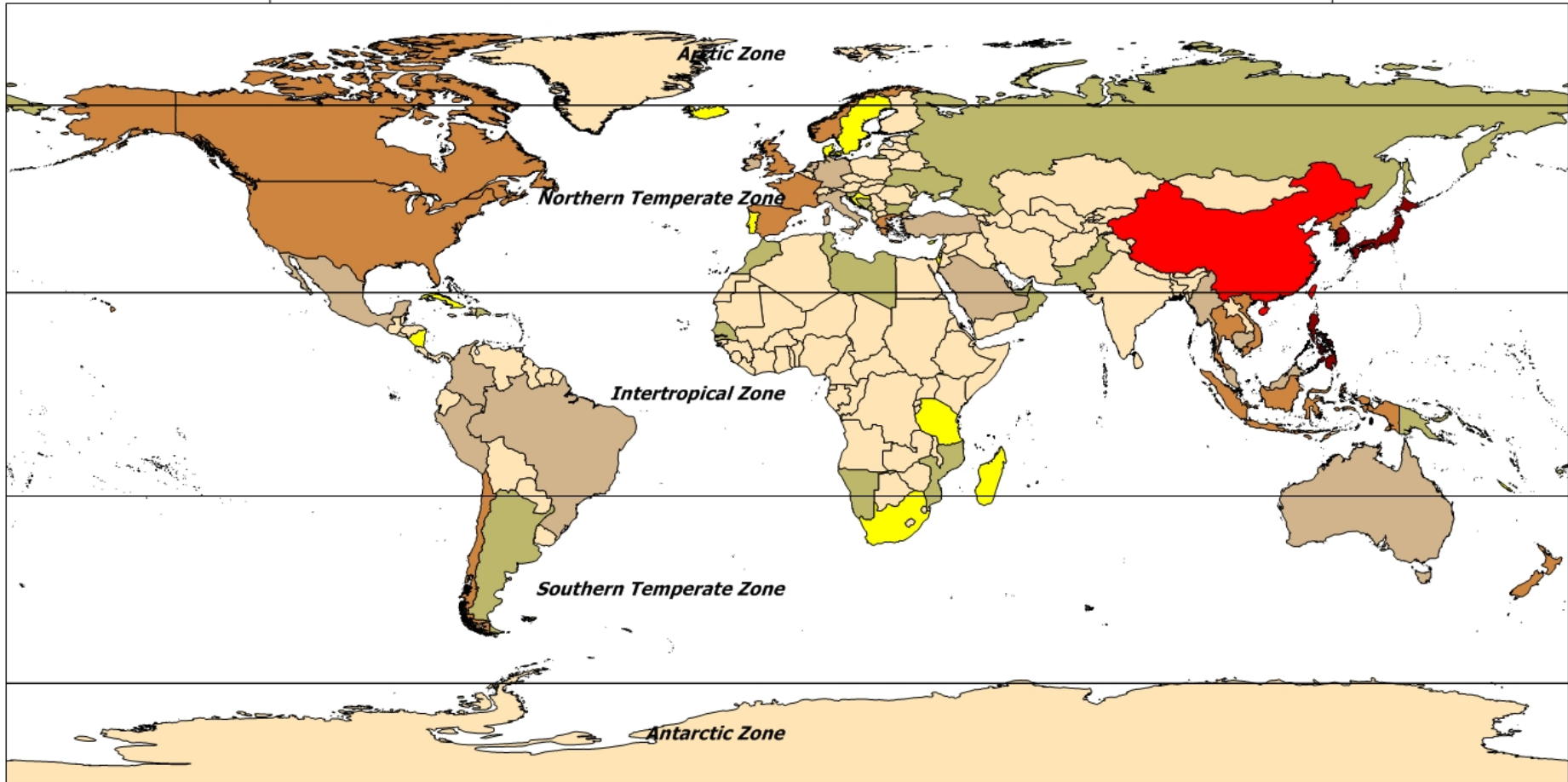
Objective and Overview

- Objective
 - Provide spatial perspectives on mariculture from a global viewpoint in the context of climate zones
- Overview of perspectives
 - Production
 - Coastline length of mariculture countries
 - Intensity of mariculture production
 - Maritime claims
 - Off of the Coast and Offshore Maritime Zones
 - Areas apt for cages and longlines
 - Example of access to ports and travel time/distance
 - Conclusions



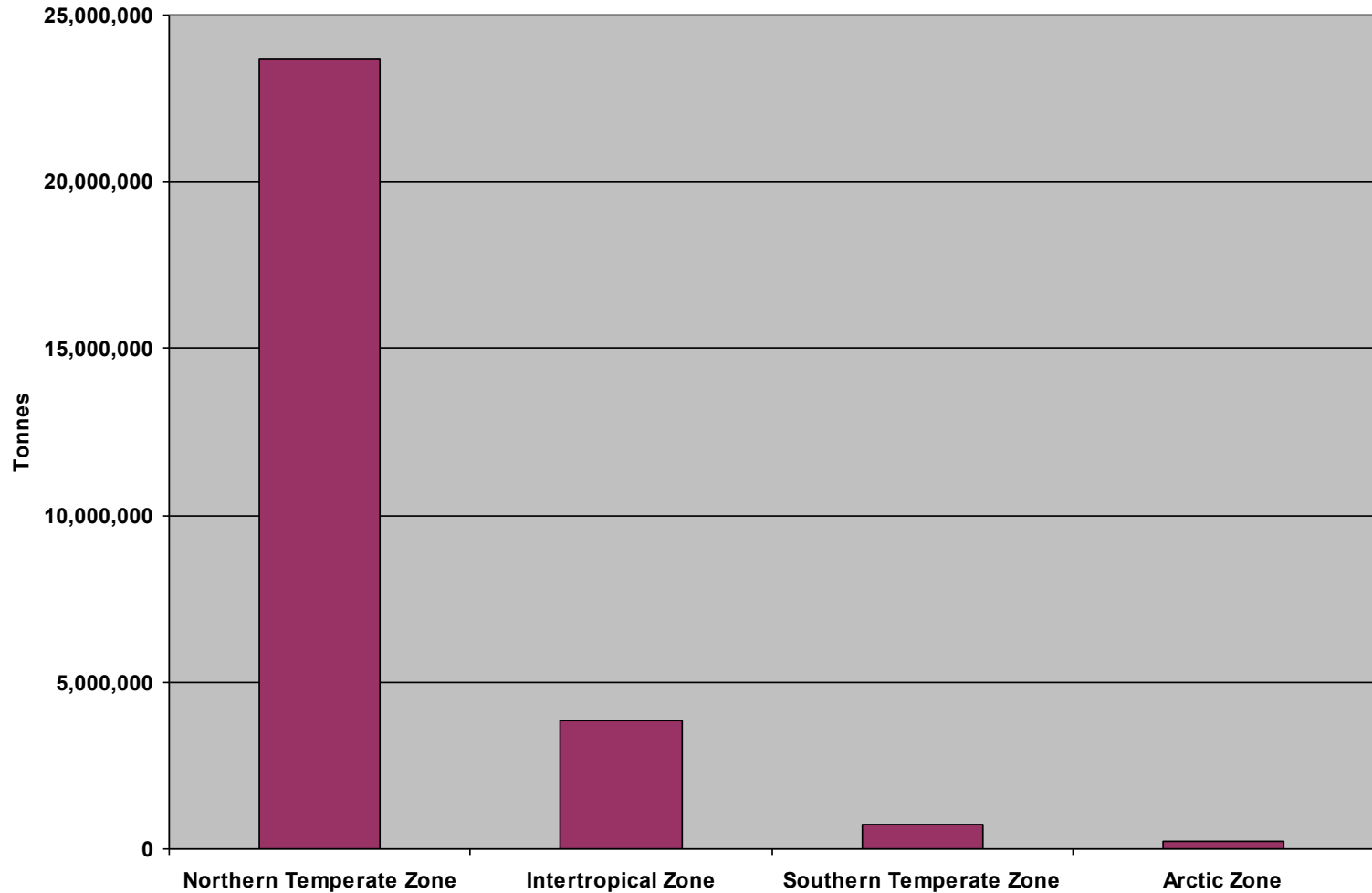
Mean Mariculture Production (2003-2007)

Mean Mariculture Production (2003-2007) in Millions of Tonnes (m) and Numbers of Countries in the Range



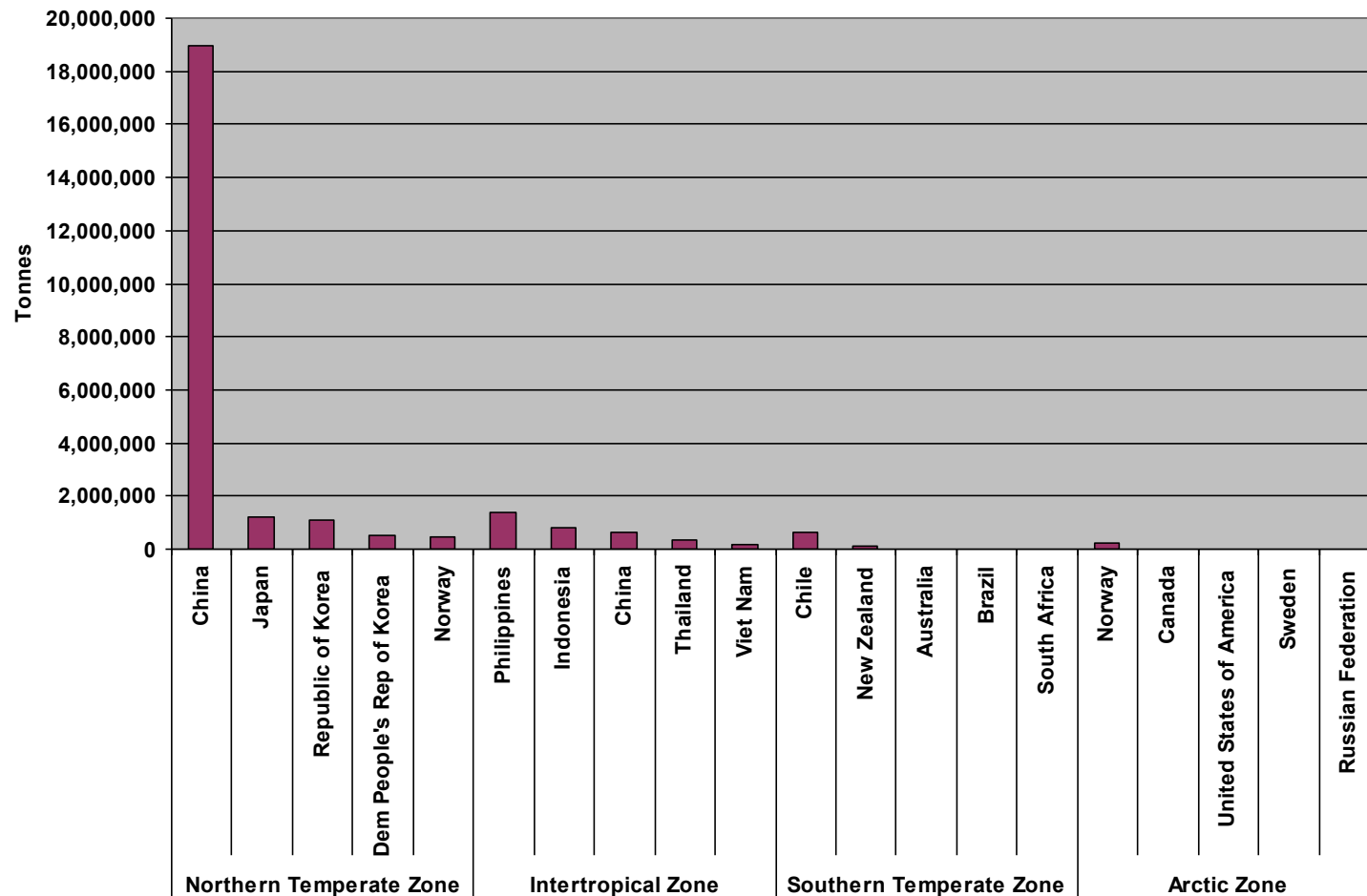
Mariculture Production by Climate Zone

Total Mariculture Production (2003-2007) by Climate Zone

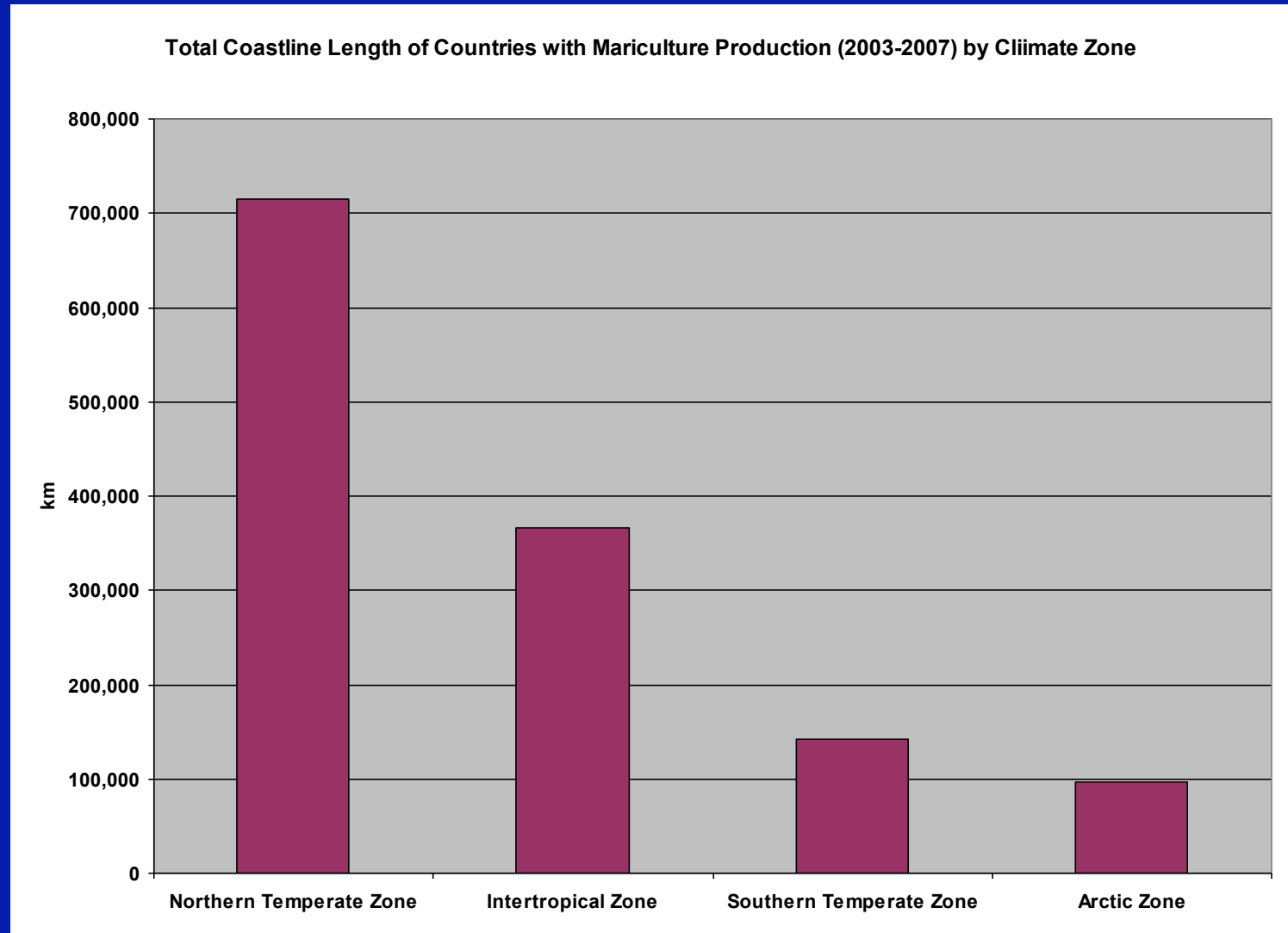


Top 5 Countries in Mariculture Production by Climate Zone

Top 5 Countries in Mariculture Production (2003-2007) by Climate Zone

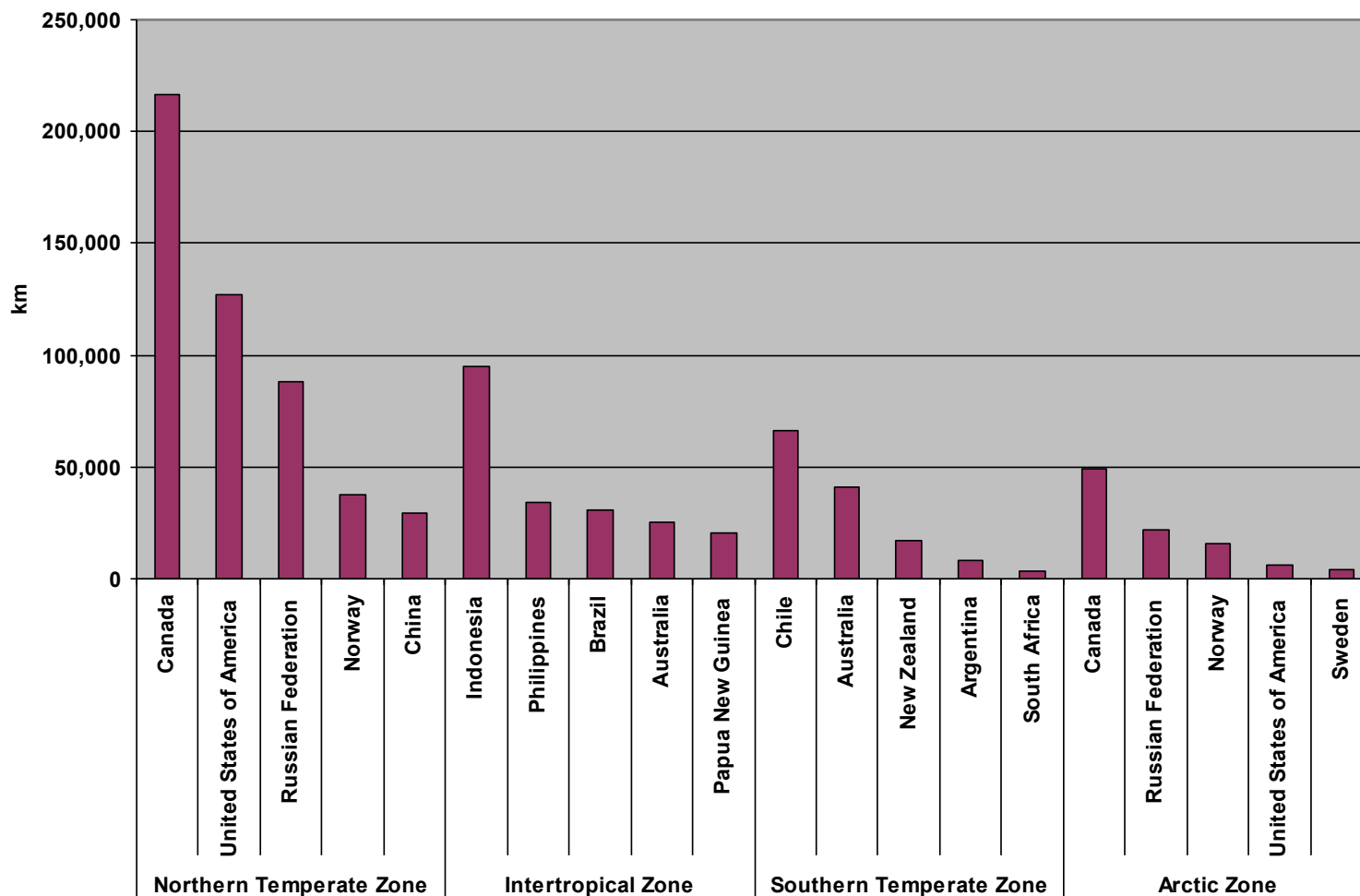


Coastline Length of Mariculture Countries by Climate Zone



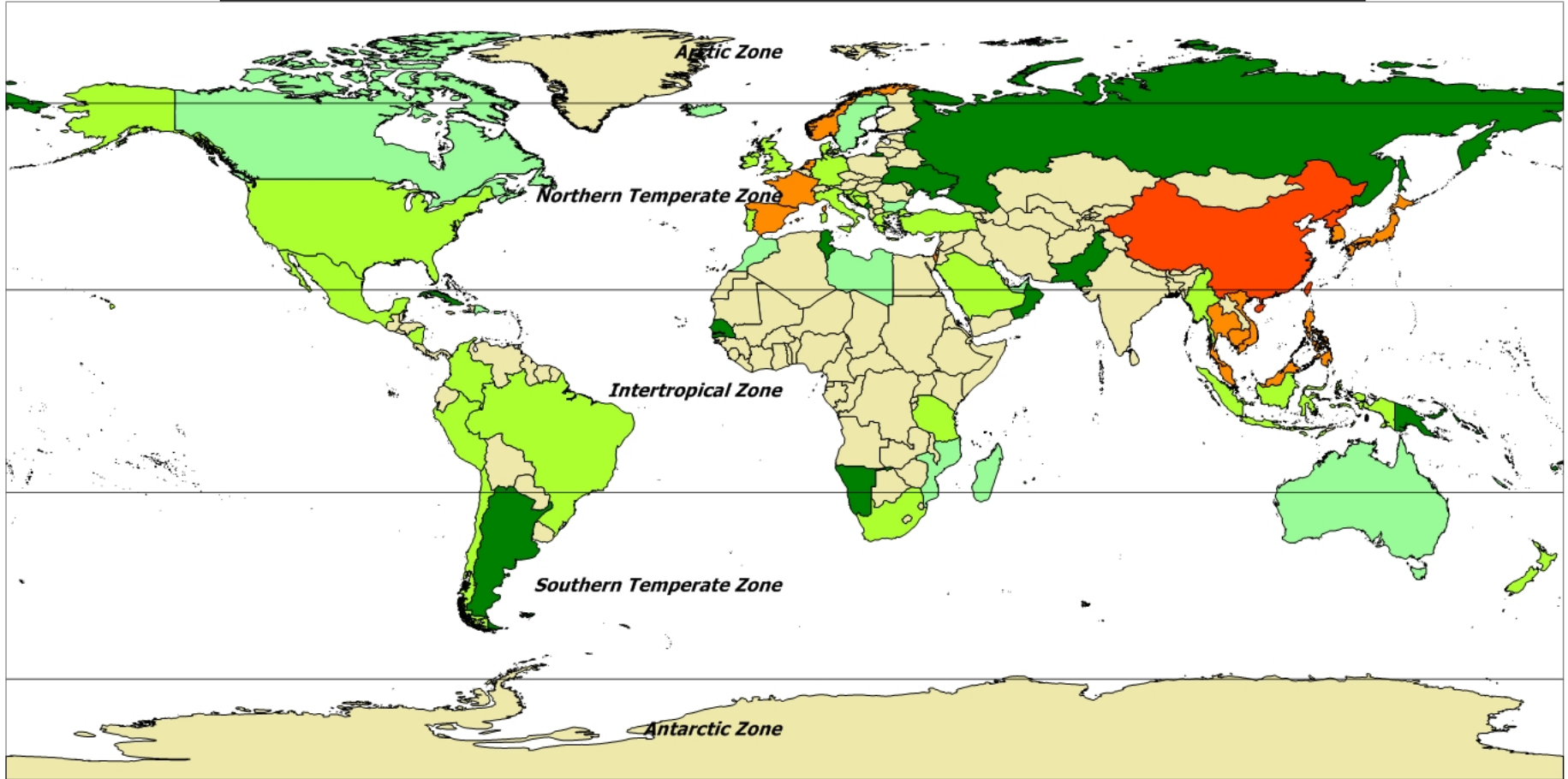
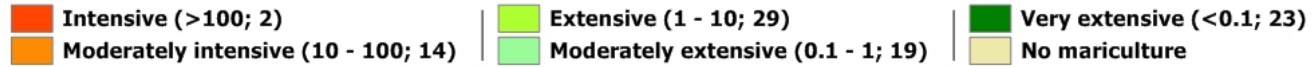
Top 5 Mariculture Countries in Coastline Length by Climate Zone

Top 5 Mariculture Countries in Coastline Length by Climate Zone

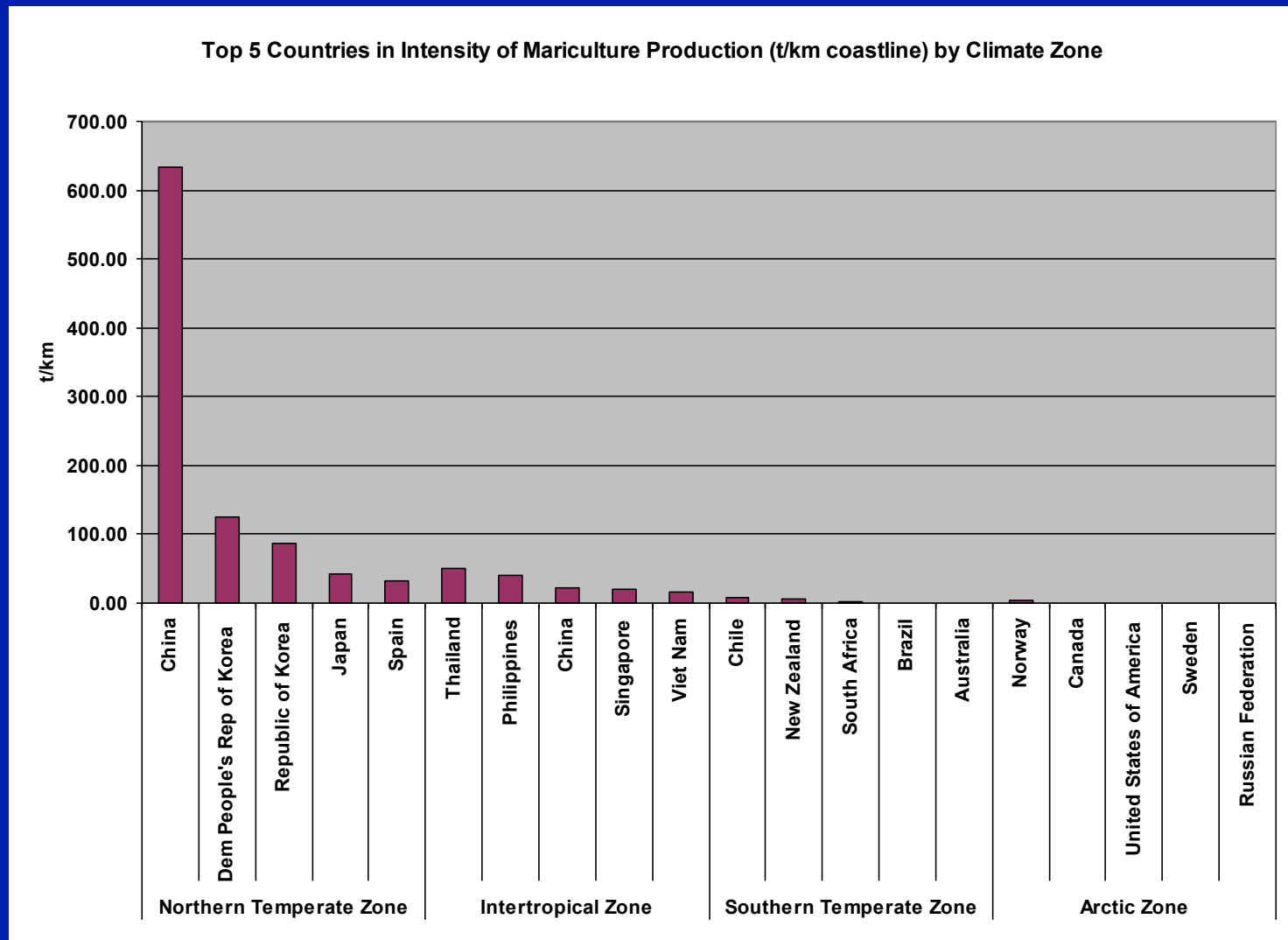


Intensity of Mariculture Production

Intensity of Mariculture Production (Tonnes/km coastline; Number of countries in range)





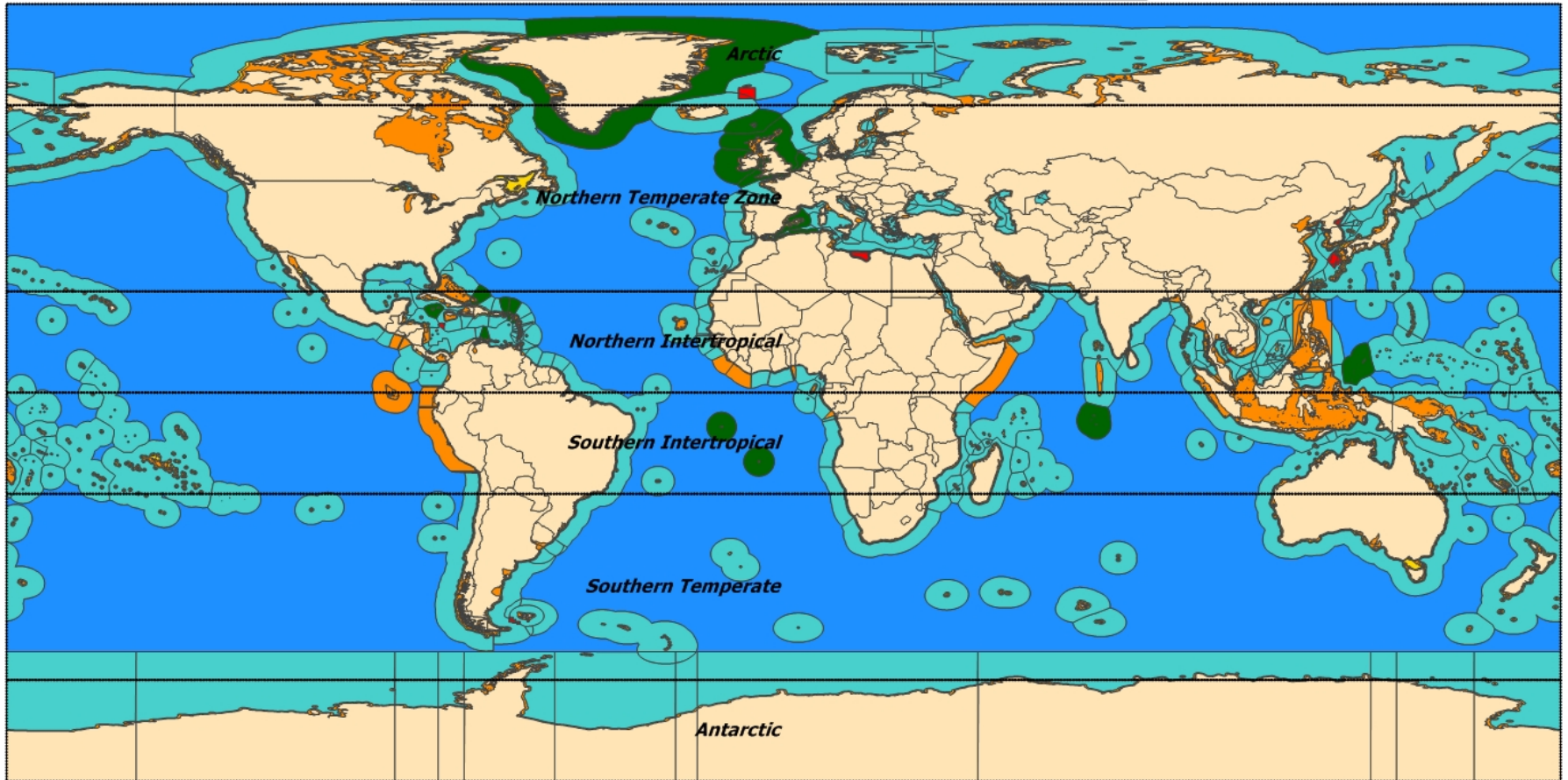
Top 5 Countries in Intensity of Mariculture by Climate Zone



Maritime Claims by Climate Zone

Kinds of Maritime Claims (Global Maritime Boundaries Database)

- | | | |
|---|---|--|
|  TERRITORIAL SEA |  ECONOMIC ZONE |  OTHER CLAIMS |
|  CONTIGUOUS ZONE |  FISHING ZONE |  HIGH SEAS |



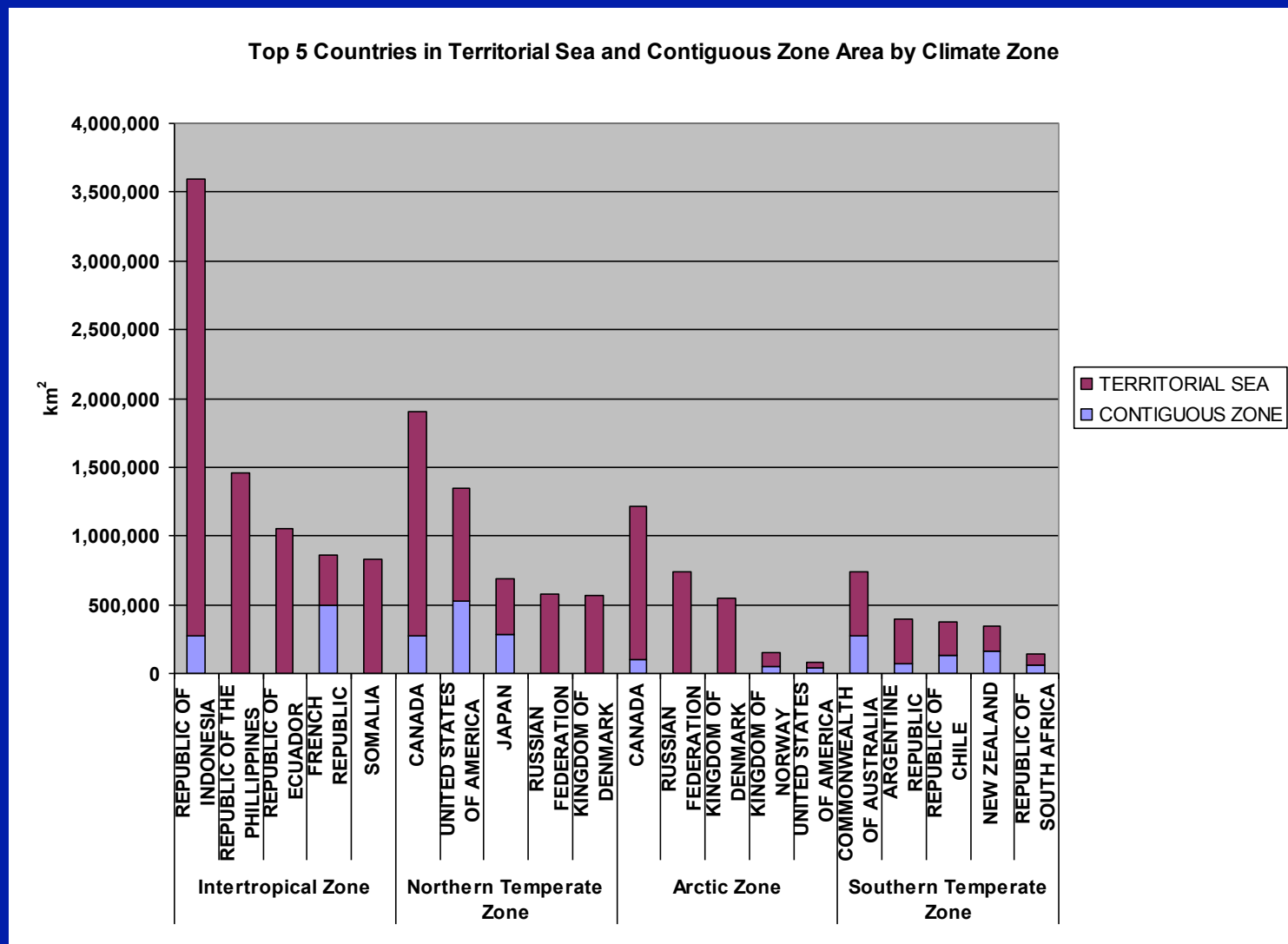
Maritime Claims Relevant to Mariculture

Abbreviated Definitions

- ***Territorial sea*** - the sovereignty of a coastal state extends beyond its land territory and internal waters to an adjacent belt of sea not exceeding 12 nautical miles.
- ***Contiguous zone*** - the zone contiguous to a coastal state's territorial sea not to extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured.
- ***Exclusive economic zone (EEZ)*** - the zone beyond and adjacent to the territorial sea in which a coastal state has: sovereign rights not to exceed 200 nautical miles from the baselines from which the breadth of the territorial sea is measured.
- ***Fishing zone*** - some states (e.g., the UK) have chosen not to claim an EEZ, but rather to claim jurisdiction over the living resources off their coast, normally the same as the EEZ or 200 nautical miles.
- (full definitions at: http://www.exxun.com/aba_notes_defs/nd_maritime_claims.html)

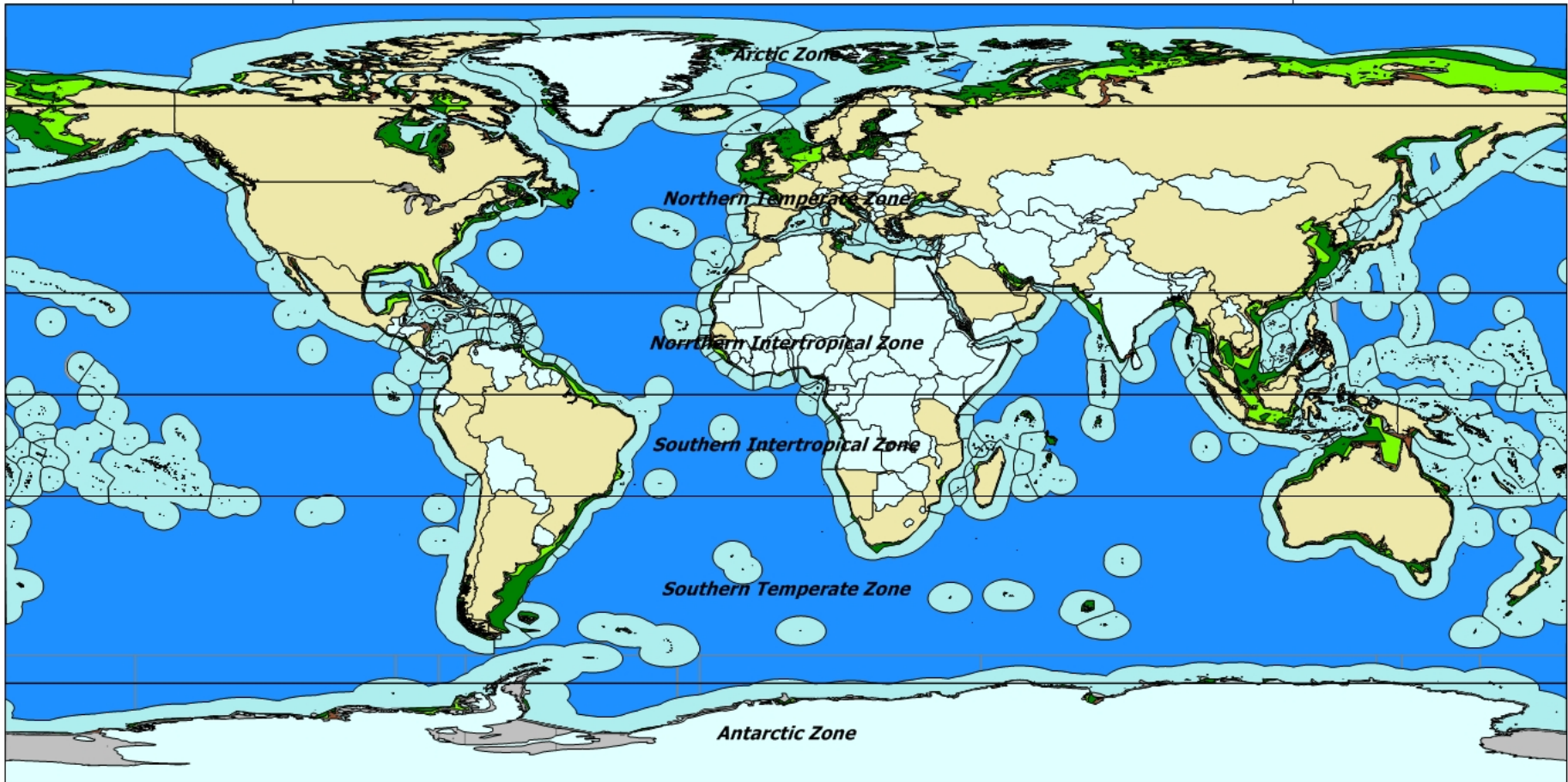


Top 5 Countries in Territorial Seas and Contiguous Zones by Climate Zone



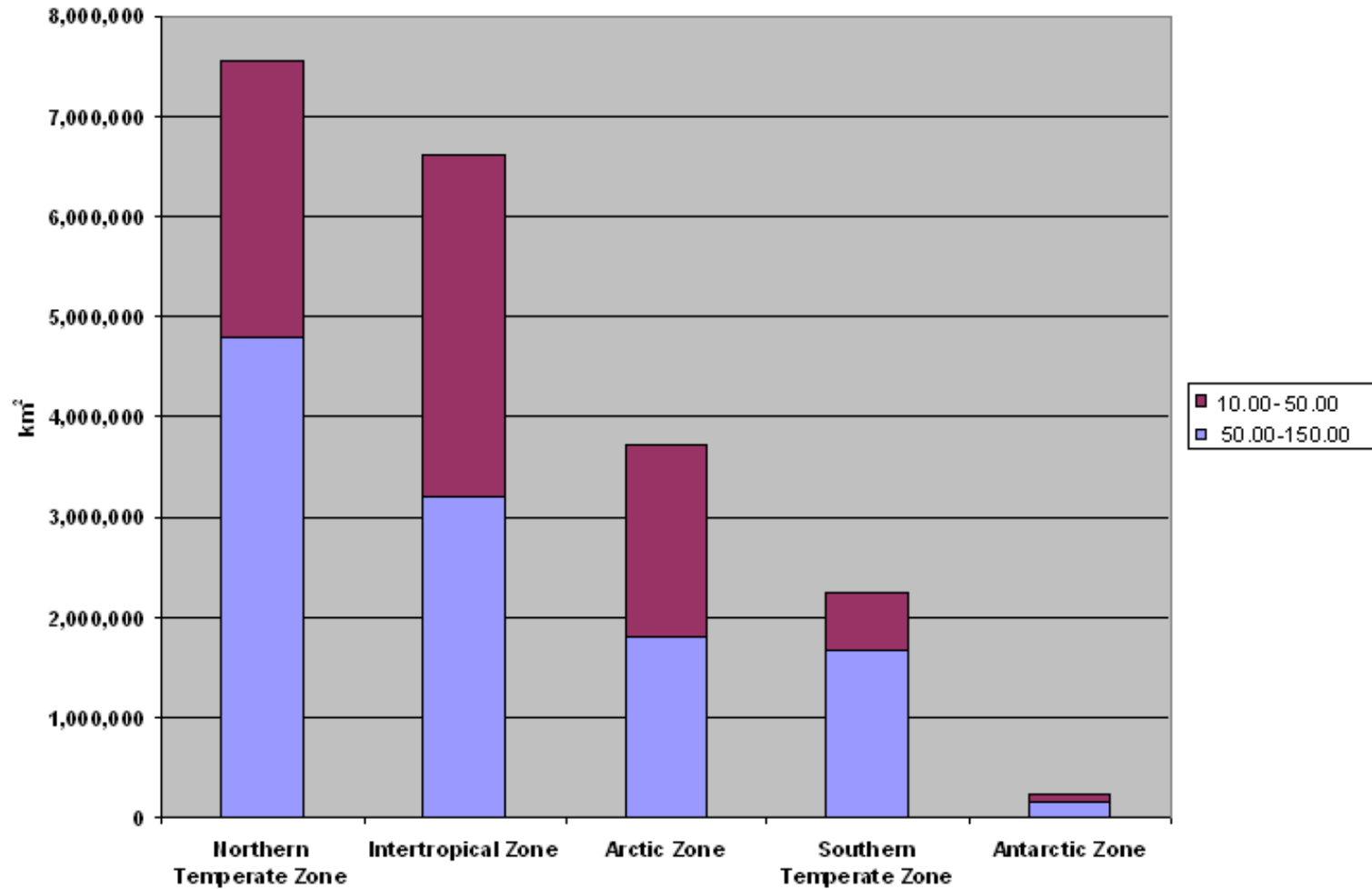
Off the Coast and Offshore Mariculture Zones

Off the Coast and Offshore Mariculture Zones as Defined by Depth



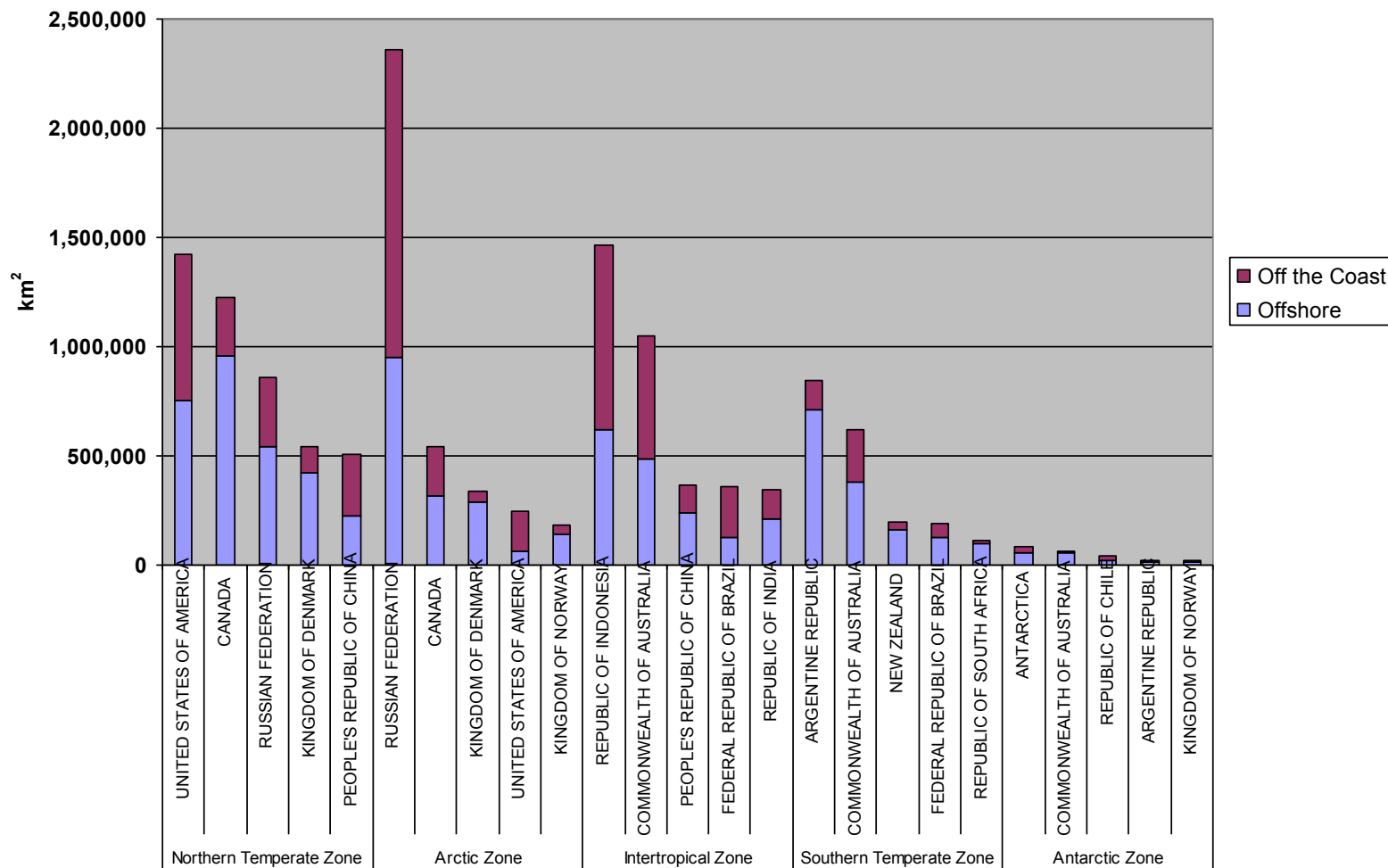
Off the Coast (10-50 m) and Offshore (50-150 m) by Climate Zone

Off of the Coast (10-50 m) and Offshore (50-150 m) Mariculture Zones by Climate Zone



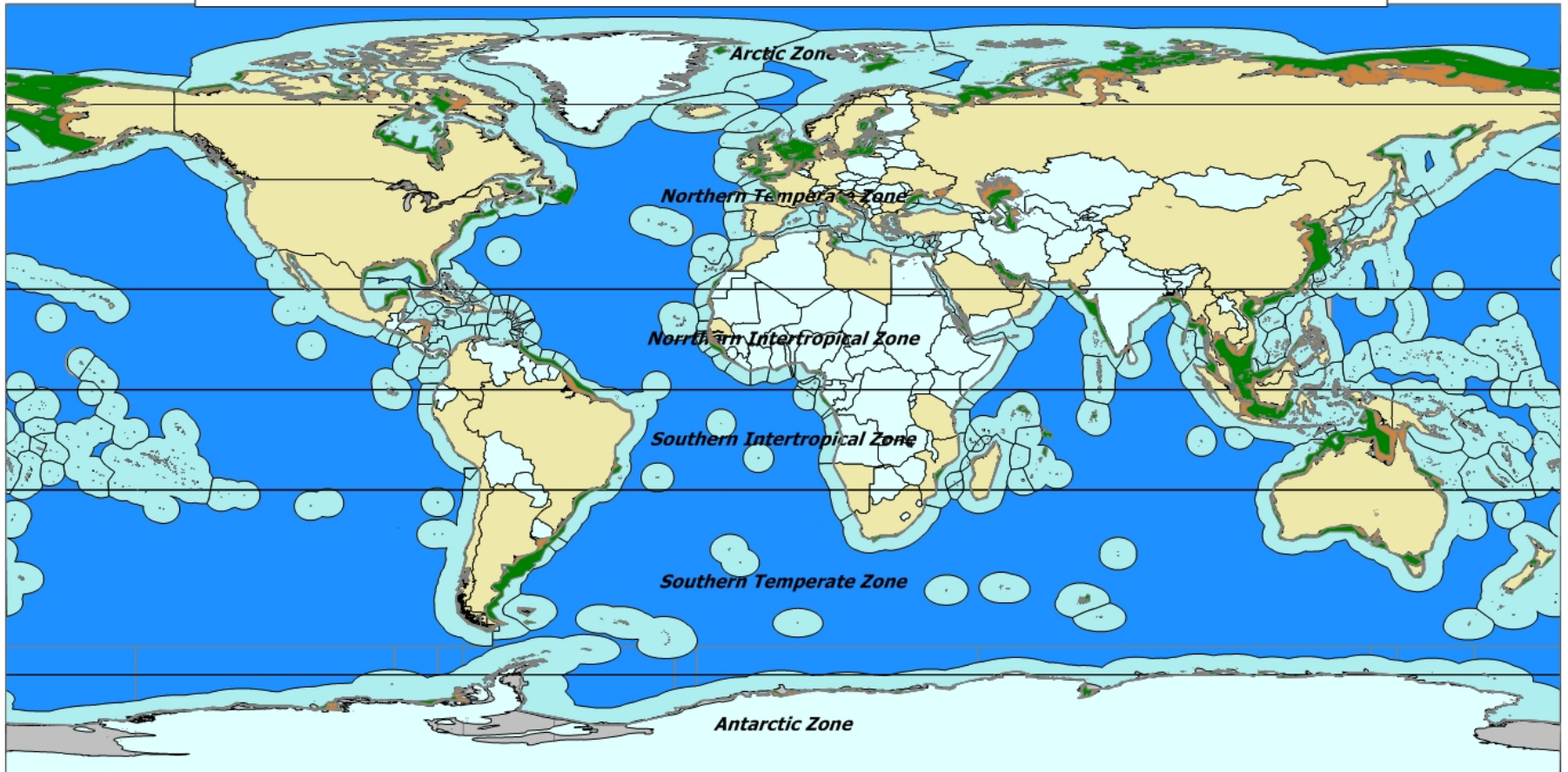
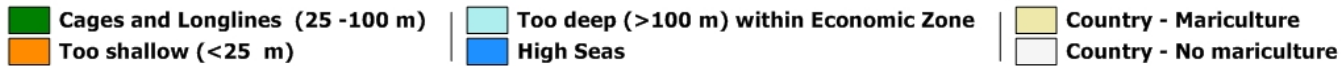
Top 5 Countries in Off the Coast (10-50 m) and Offshore (50-150 m) Area by Climate Zone

Top 5 Countries in Off the Coast (10-50 m) and Offshore (50-150 m) Mariculture Zones by Climate Zone

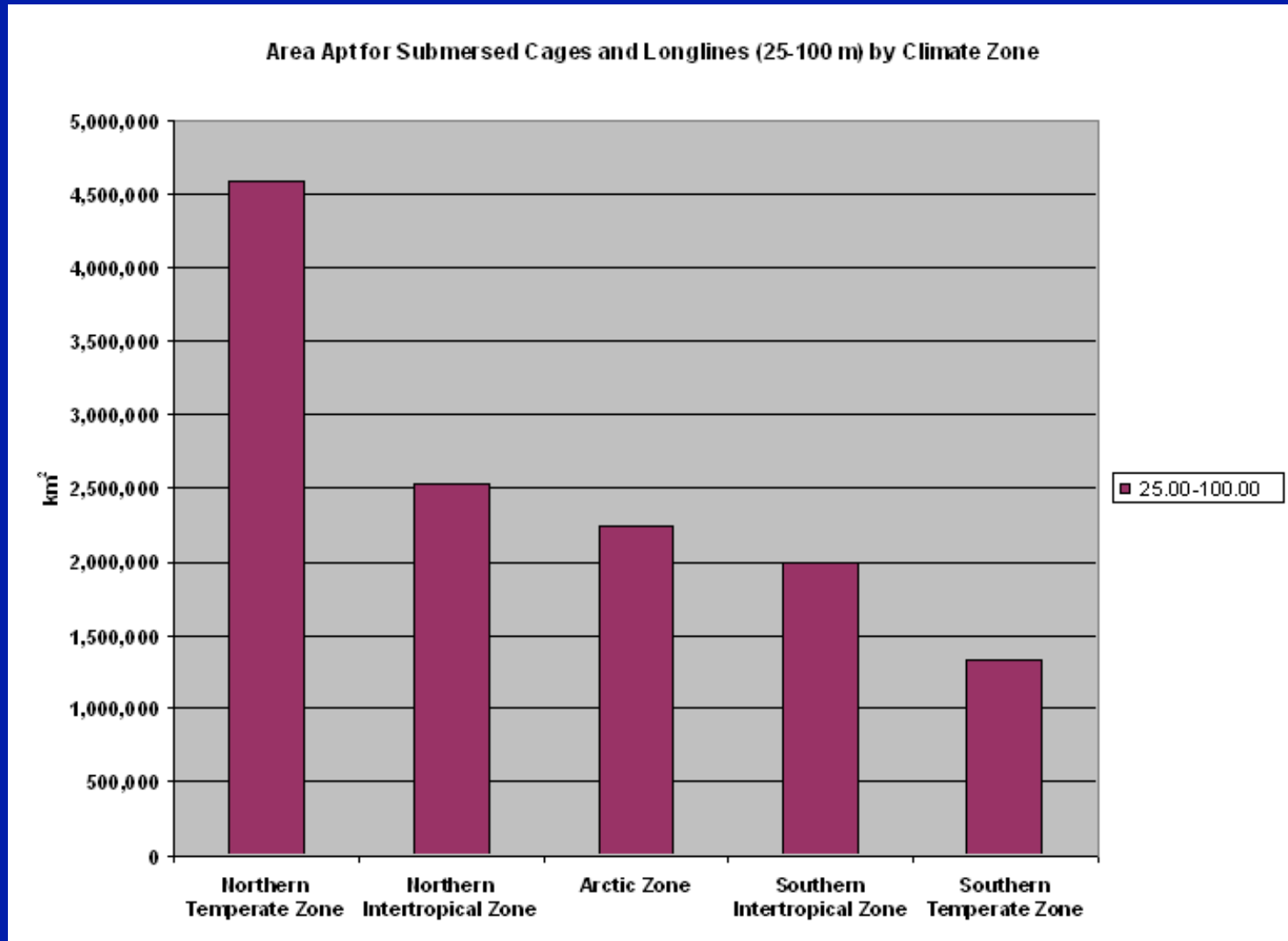


Areas Apt for Submersed Cages and Longlines (25-100 m)

Depths for Submersed Cages and Longlines

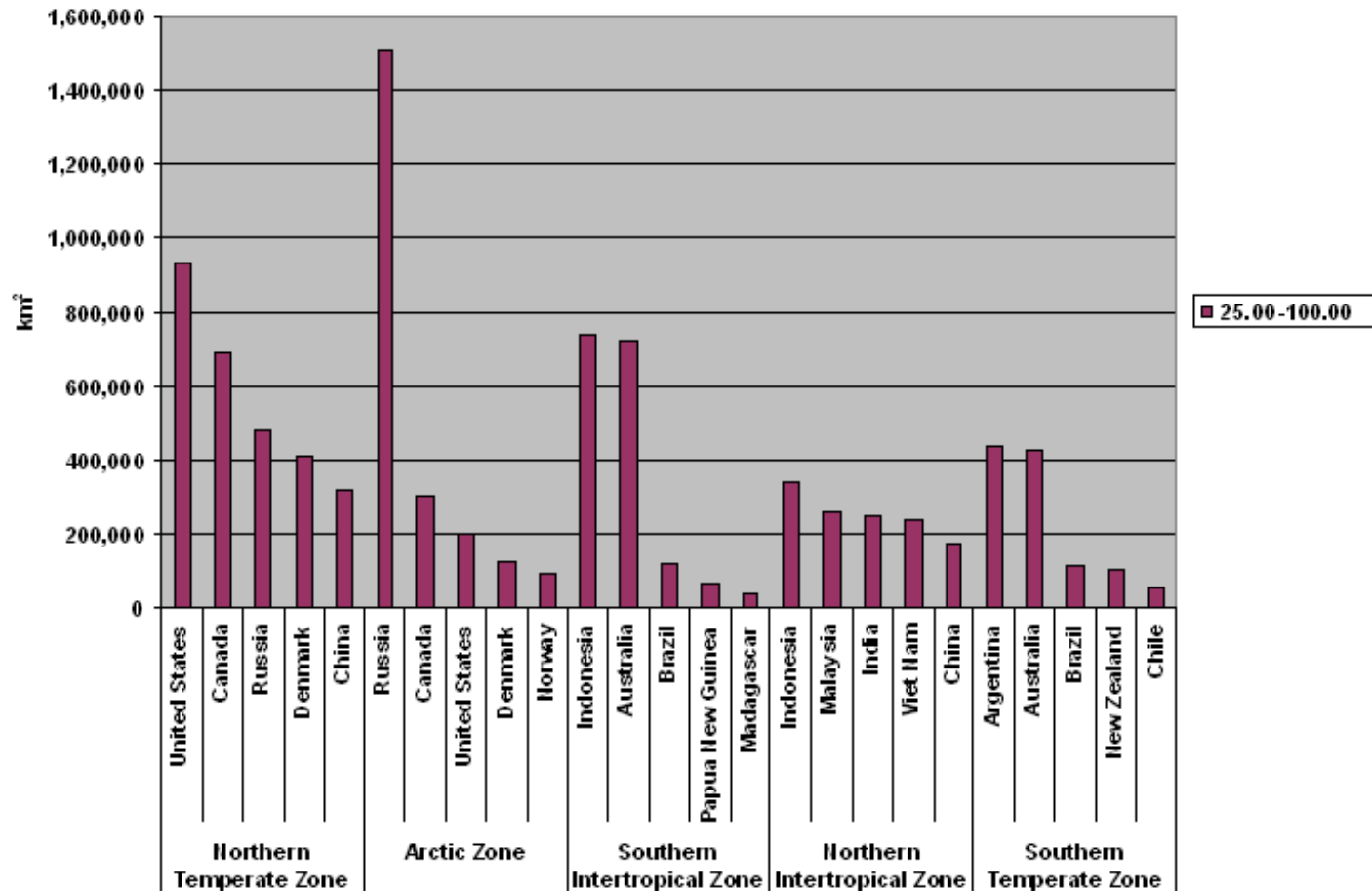


Area Apt for Cages and Longlines (25–100 m) by Climate Zone

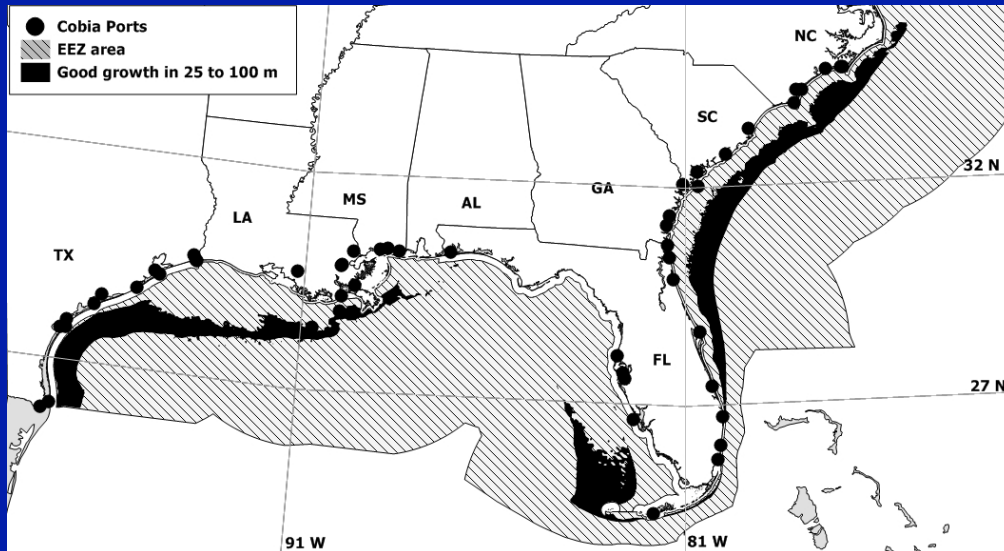
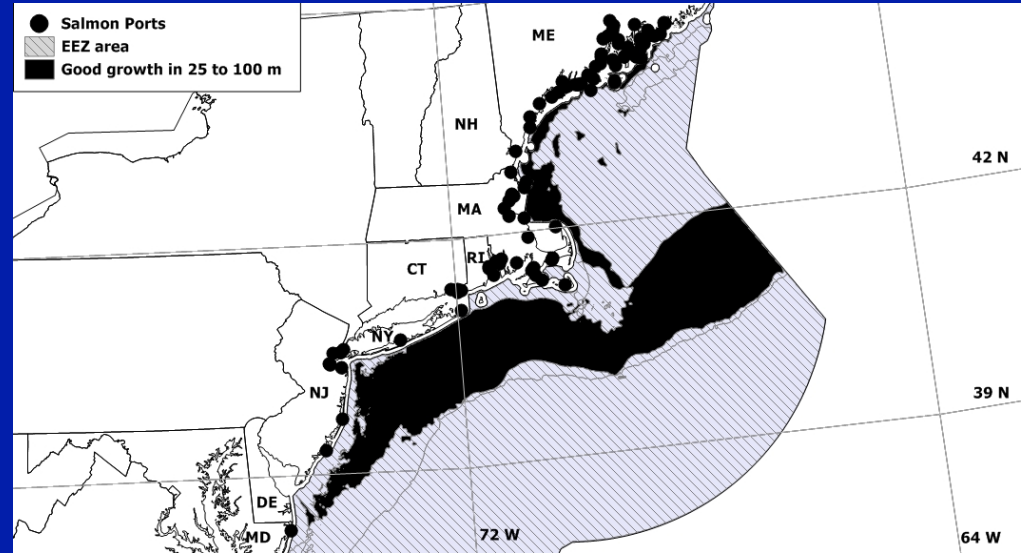


Top 5 Countries in Area Apt for Cages and Longlines by Climate Zone

Top 5 Countries in Area Apt for Cages and Longlines (25-100 m) by Climate Zone



Effect of Port Access and Time/Distance on Mariculture Potential



Conclusions

- The Northern Temperate Zone leads in:
 - Mariculture production
 - Length of shoreline among mariculture countries
 - Countries with the highest intensities of mariculture production (t/km shoreline)
 - Area of Off the Coast (10-50 m) and Offshore (50-150 m) mariculture zones
 - Area apt for cages and longlines (25-100m)
- Availability of ports and associated services and their proximity to suitable culture sites will be key factors determining locations of offshore mariculture



Upcoming Spatial Perspectives on Mariculture Potential:

Present Technologies and Future Systems

- Areas apt for cobia as an example of potential for warm temperate mariculture
- Areas apt for Atlantic salmon and blue mussel in integrated multitrophic mariculture as a cool temperate example
- Improved estimates of production factors including:
 - Use the Hybrid Coordinate Ocean Model (HYCOM) to create a global dataset on current speed and temperature
 - Global chlorophyll-a data set
 - Global access to ports and estimate economic cost components (e.g. increase in costs due to distance from ports and with increase in depths)
 - Incorporate existing models to determine species growth within or outside of the GIS
 - Verification of estimates of potential based on locations of existing aquaculture.
- Thematic maps (e.g., Marine Ecosystems of the World, Natural Disaster Hotspots, The Global 200: Priority Ecosystems for Global Conservation)

