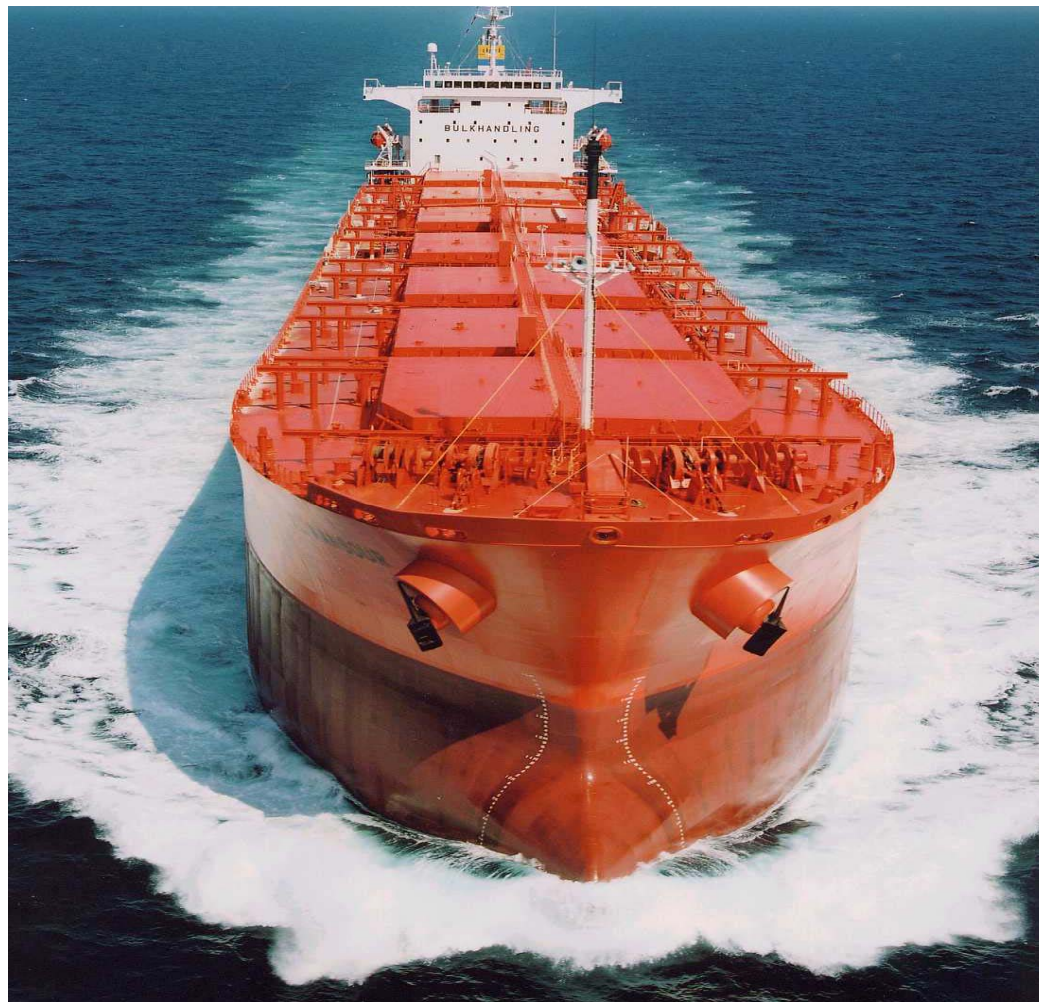


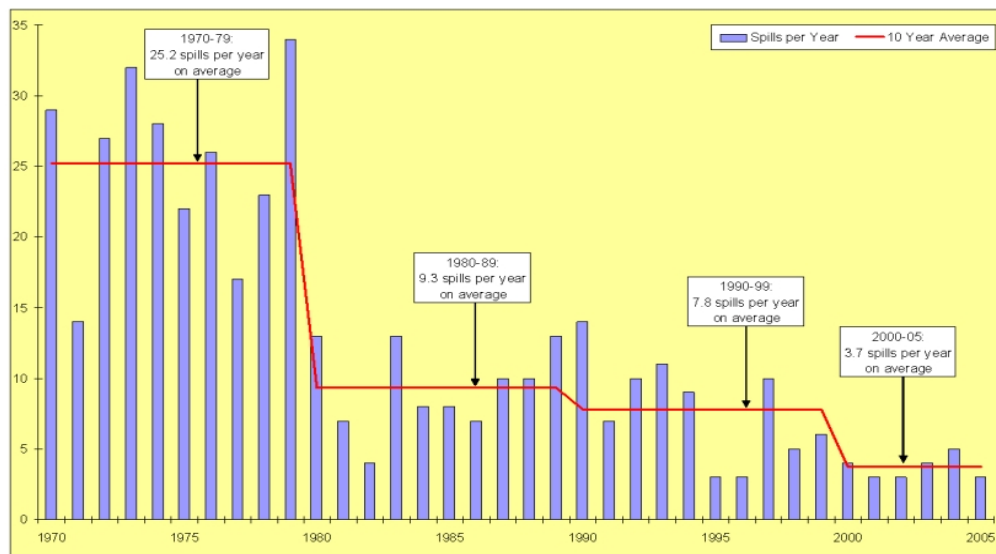


THE TORVALD
KLAIVENESS
GROUP

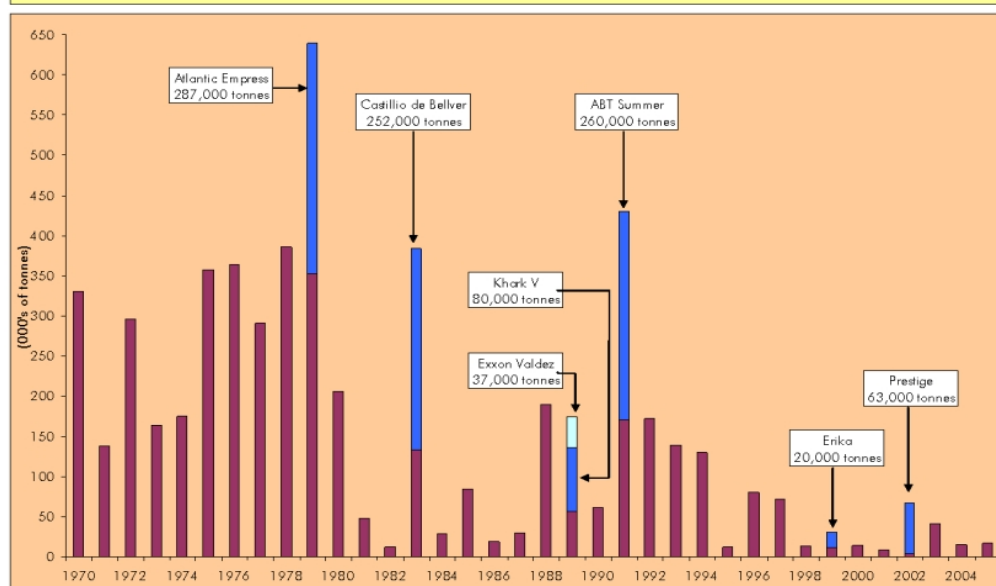


Environmental Challenges – A Shipowner's Perspective

A positive trend in accidental spills



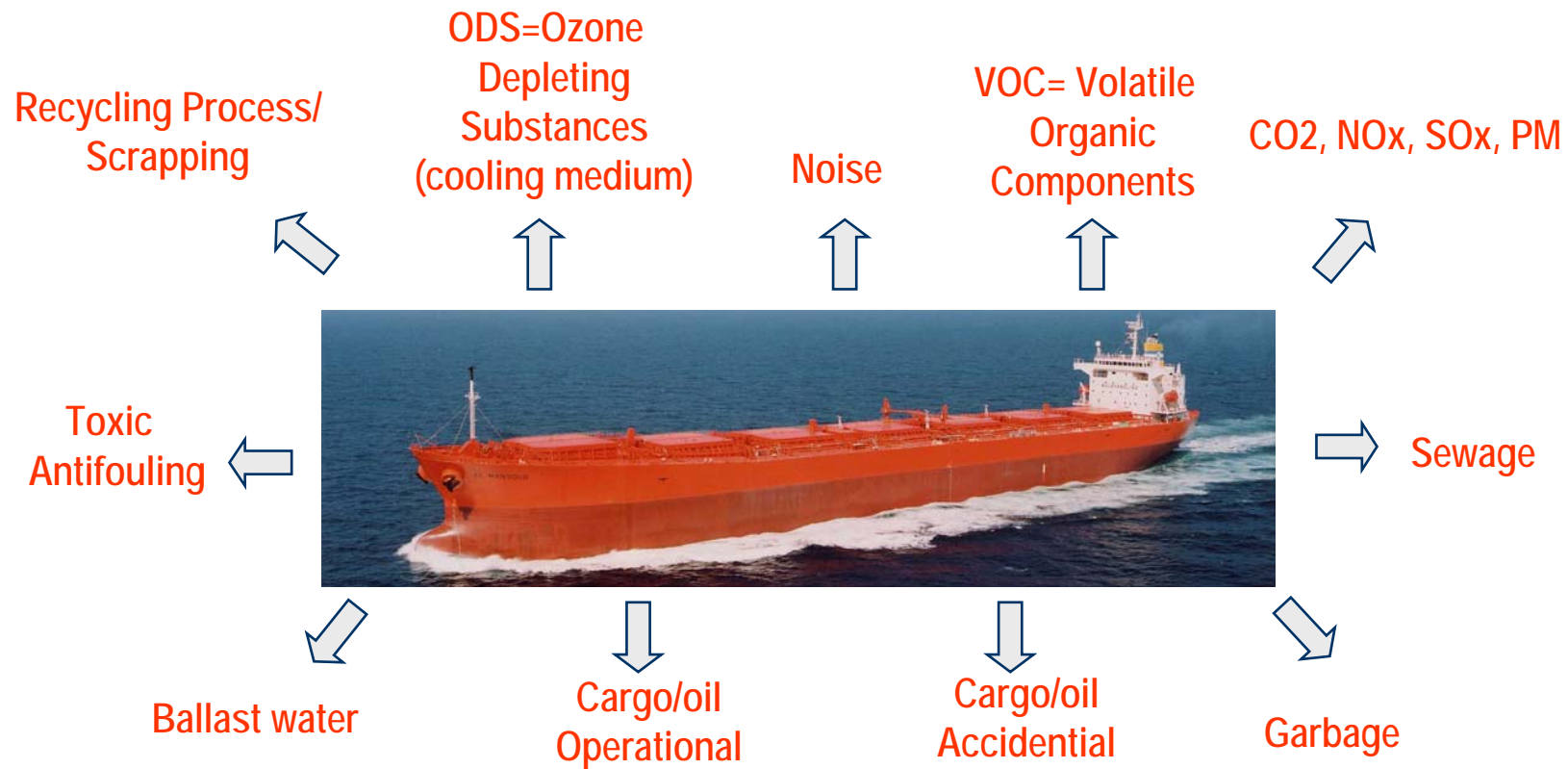
NO. OF OILS SPILL
ABOVE 700 TONS



QUANTITIES OF OIL
SPILLED (>7 t)

Source: International Tanker Owners
Pollution Federation (ITOPF)

Shipping is facing several environmental challenges



Dust



Noise



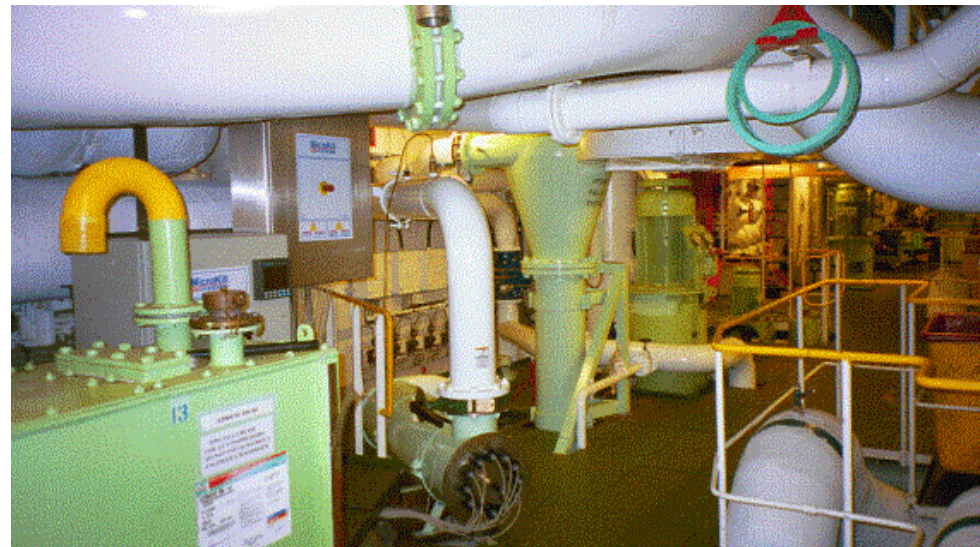
Hold Washing – Where to Flush?



In Ballast (...but laden with organisms)



OptiMar Ballast Treatment System



Recycling – a local and global environmental burden



Chittagong, Bangladesh, February 2000

Photo: DNV

The Main Issue Today....



CO₂

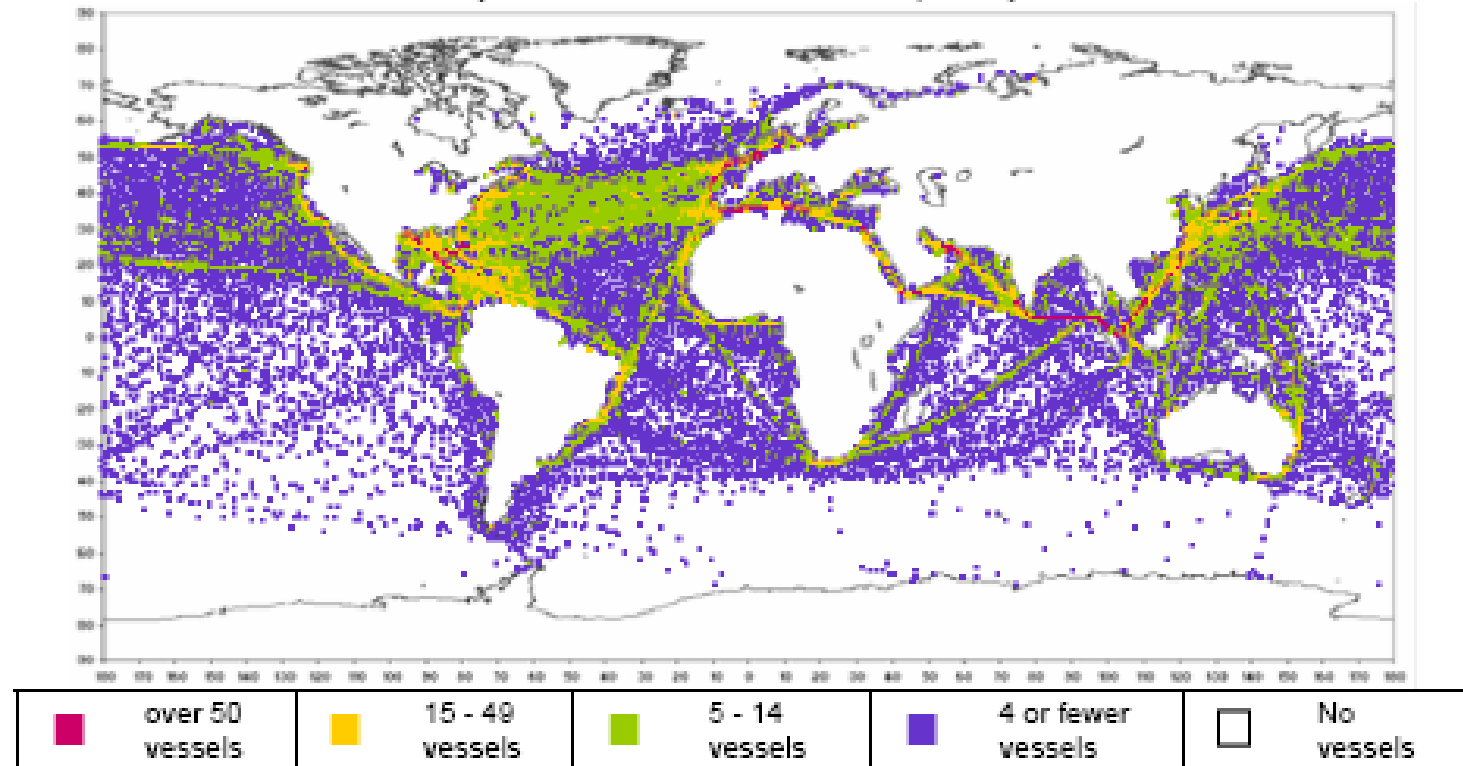


Global scale of shipping activities – 70% within 200nm from shore

Figure 1: Vessel Traffic – January 2006

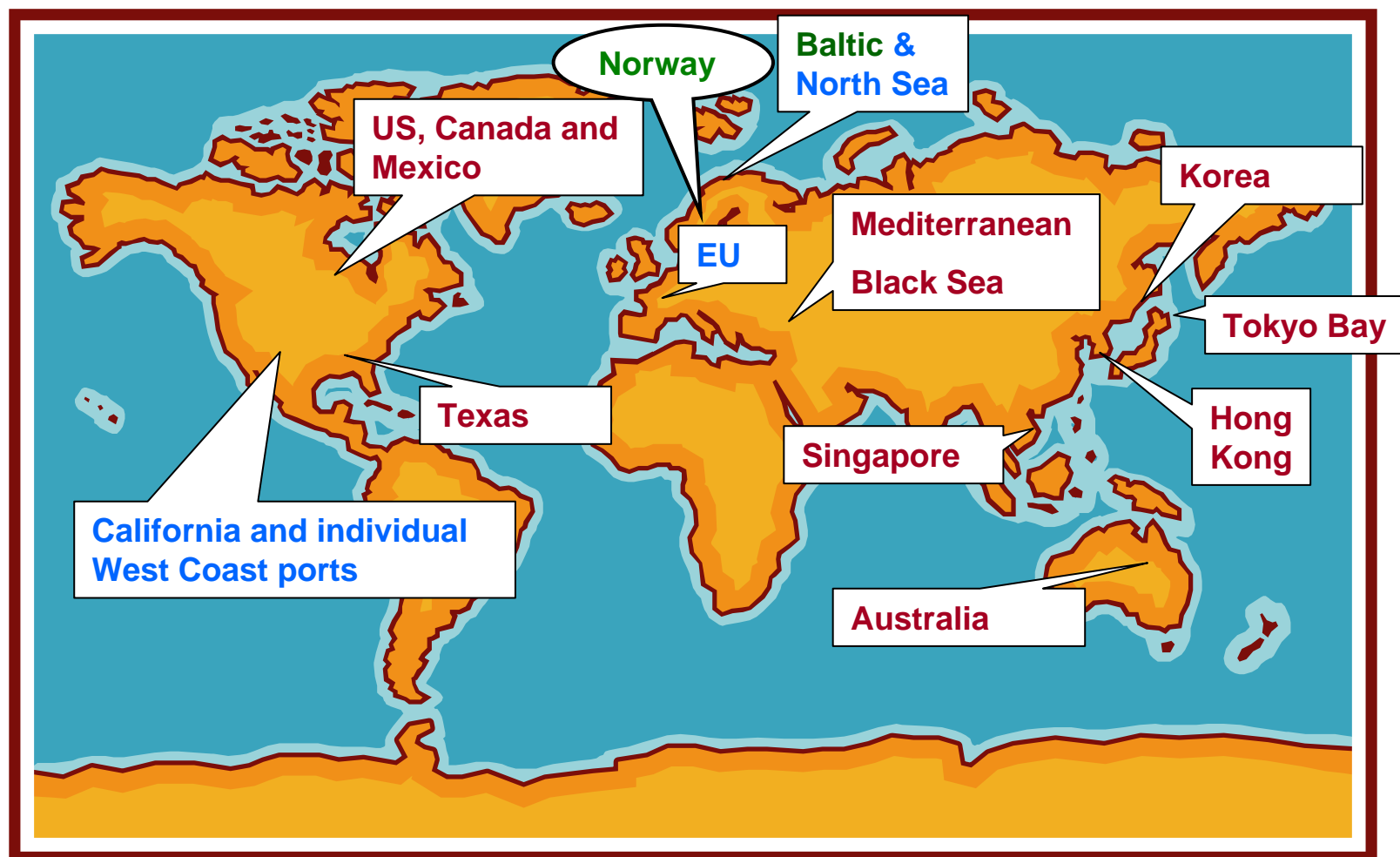
Each colored dot displayed on the chart approximates a one-degree cell (60 minutes of latitude by 60 minutes of longitude) and is a monthly approximation of vessel traffic density.

(Source: USCG AMVER system)

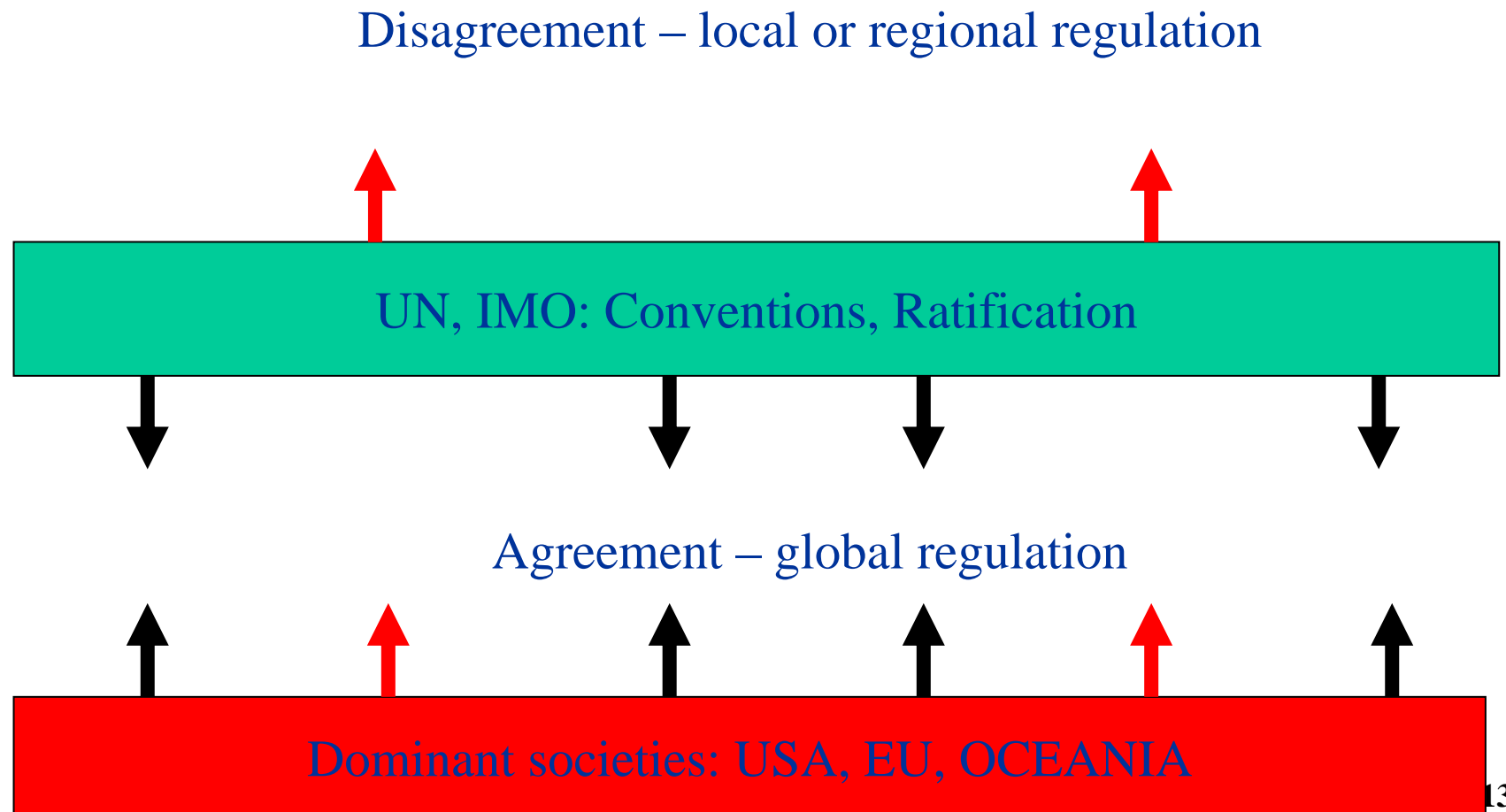


More stringent NO_x and SO_x legislations

Existing, future and potentially future areas with stringent sulphur legislation



The Decision Making Process



IMO Environmental Conventions and Annexes

Conventions	Annexes
Antifouling	
Recycling	
Ballastwater	
Green house gases??	
Marpol	Annex I - Oil Annex II - Noxious liquid substances Annex III - Harmful substances in Packaged form Annex IV - Sewage Annex V - Garbage Annex VI - Emission to air

Consequences

- Cost of bunker
- Emission taxes
- Abatement costs (new technology)
- Σ = Equivalent USD 500-1000 per MT
- Enough supply of Distillates?
- New ship designs

Challenges Are Also Opportunities

