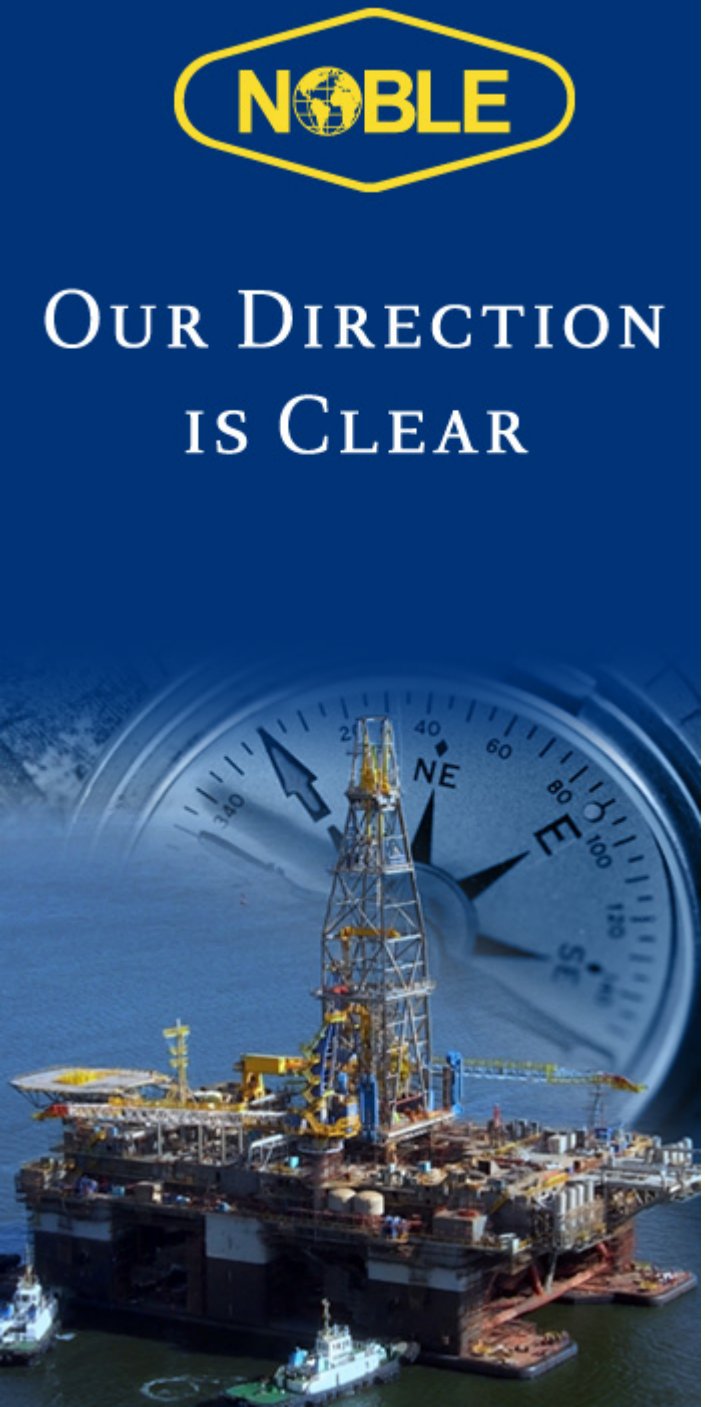


Noble Corporation

Globalization and the Threat of Invasive Species to Marine Biodiversity.

The mobility of the MODU under increased scrutiny.

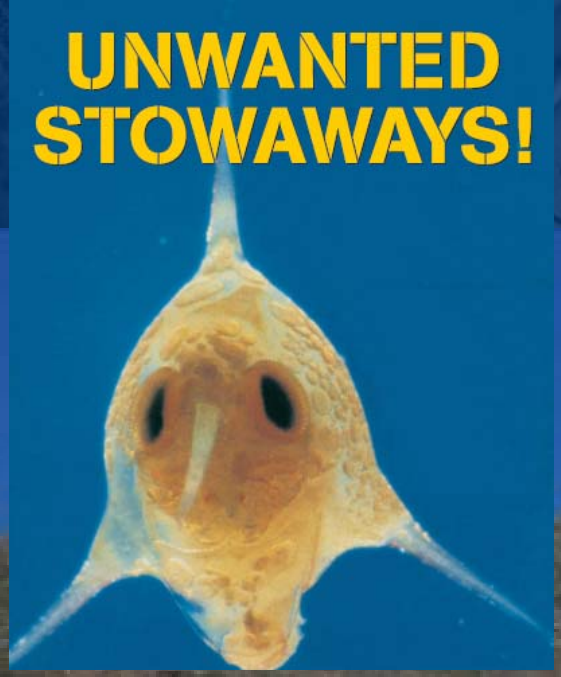
CASE STUDY: Moving one unit into the Mediterranean

Franco dos Santos

Environmental Co-ordinator

Forward Looking Statement

This presentation contains “forward-looking statements” about our business, financial performance and prospects. Statements about our plans, intentions, expectations, beliefs, estimates, predictions or similar expressions for the future are forward-looking statements. We cannot assure you that the outcomes of these forward-looking statements will be realized. Various factors could cause actual results to differ materially. We discuss these factors, including risks and uncertainties, from time to time in our SEC filings. The Company disclaims any duty to update the information presented here. The material presented is copyrighted by the Company and cannot be printed, recorded or rebroadcast without our express written consent. We have attached a reconciliation to GAAP of any non-GAAP measures appearing in this presentation. Additional information about Noble Corporation is available on our Web site at www.noblecorp.com.



NOBLE

invasive alien species

– a growing threat in Regional Seas

INVASIVE SPECIES in the NEWS

Marine species most endangered in Qatar: Expert

Tauranga clear of marine invaders

Ship discharges threaten sea life

'The lake doesn't have a future'

Setback feared in Isles' fight against invasive species

Exotic Fish Invading Atlantic

invasive species are changing the environment in Oregon.

Invasion of the Blobs

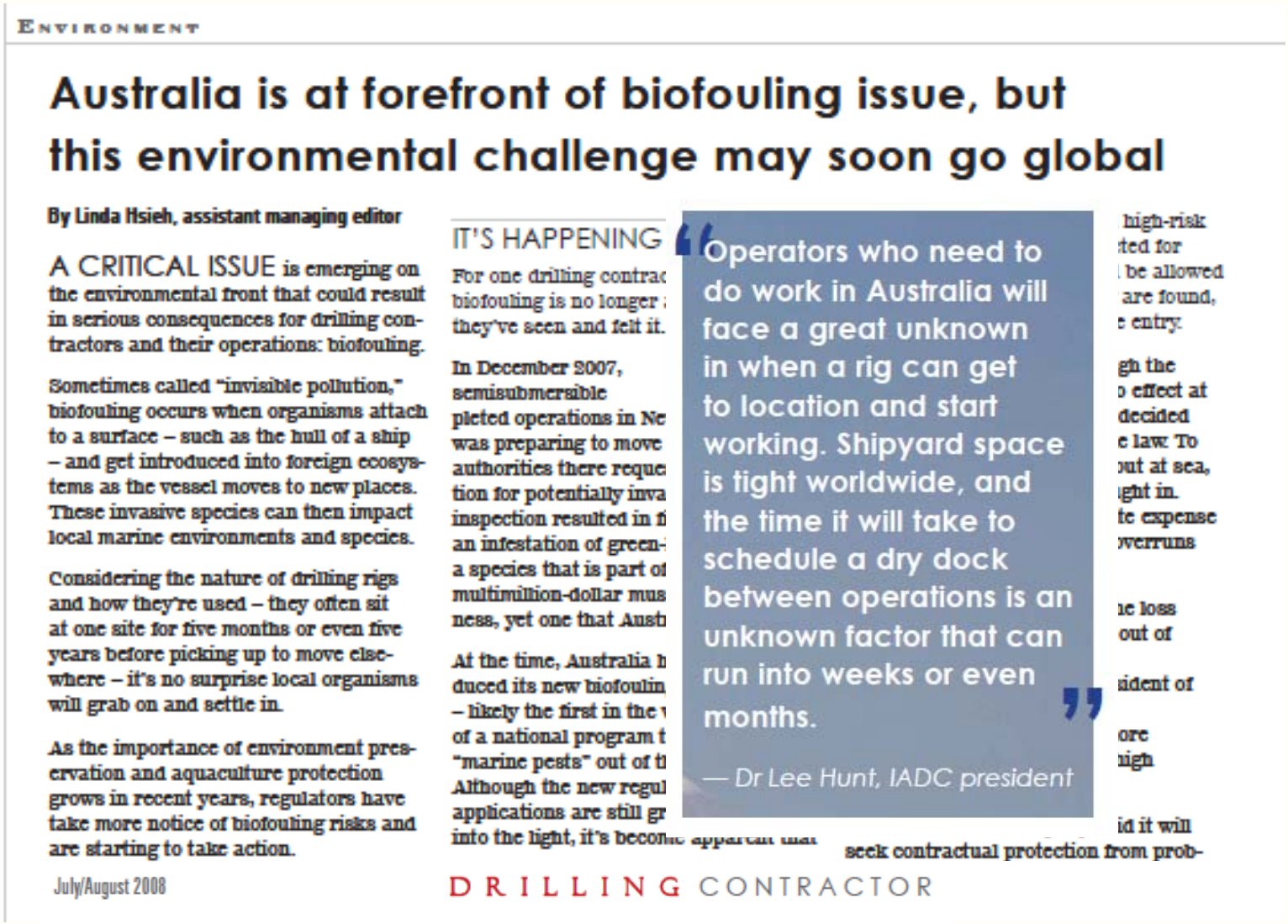
Think pink: Galapagos' rosy lizard is new species

Scientists report on explosive growth of invasive quagga mussels

Protected wadi under siege by alien fish

In The News

Governments new approach



ENVIRONMENT

Australia is at forefront of biofouling issue, but this environmental challenge may soon go global

By Linda Hsieh, assistant managing editor

A CRITICAL ISSUE is emerging on the environmental front that could result in serious consequences for drilling contractors and their operations: biofouling.

Sometimes called "invisible pollution," biofouling occurs when organisms attach to a surface – such as the hull of a ship – and get introduced into foreign ecosystems as the vessel moves to new places. These invasive species can then impact local marine environments and species.

Considering the nature of drilling rigs and how they're used – they often sit at one site for five months or even five years before picking up to move elsewhere – it's no surprise local organisms will grab on and settle in.

As the importance of environment preservation and aquaculture protection grows in recent years, regulators have take more notice of biofouling risks and are starting to take action.

IT'S HAPPENING

For one drilling contrac
biofouling is no longer
they've seen and felt it.

In December 2007,
semisubmersible
pleted operations in Ne
was preparing to move
authorities there reque
tion for potentially inva
inspection resulted in f
an infestation of green-
a species that is part of
multimillion-dollar mus
ness, yet one that Austr

At the time, Australia h
duced its new biofoulin
– likely the first in the
of a national program t
"marine pests" out of t
Although the new regul
applications are still gr
into the light, it's becom

> "Operators who need to do work in Australia will face a great unknown in when a rig can get to location and start working. Shipyard space is tight worldwide, and the time it will take to schedule a dry dock between operations is an unknown factor that can run into weeks or even months."
>
> — Dr Lee Hunt, IADC president

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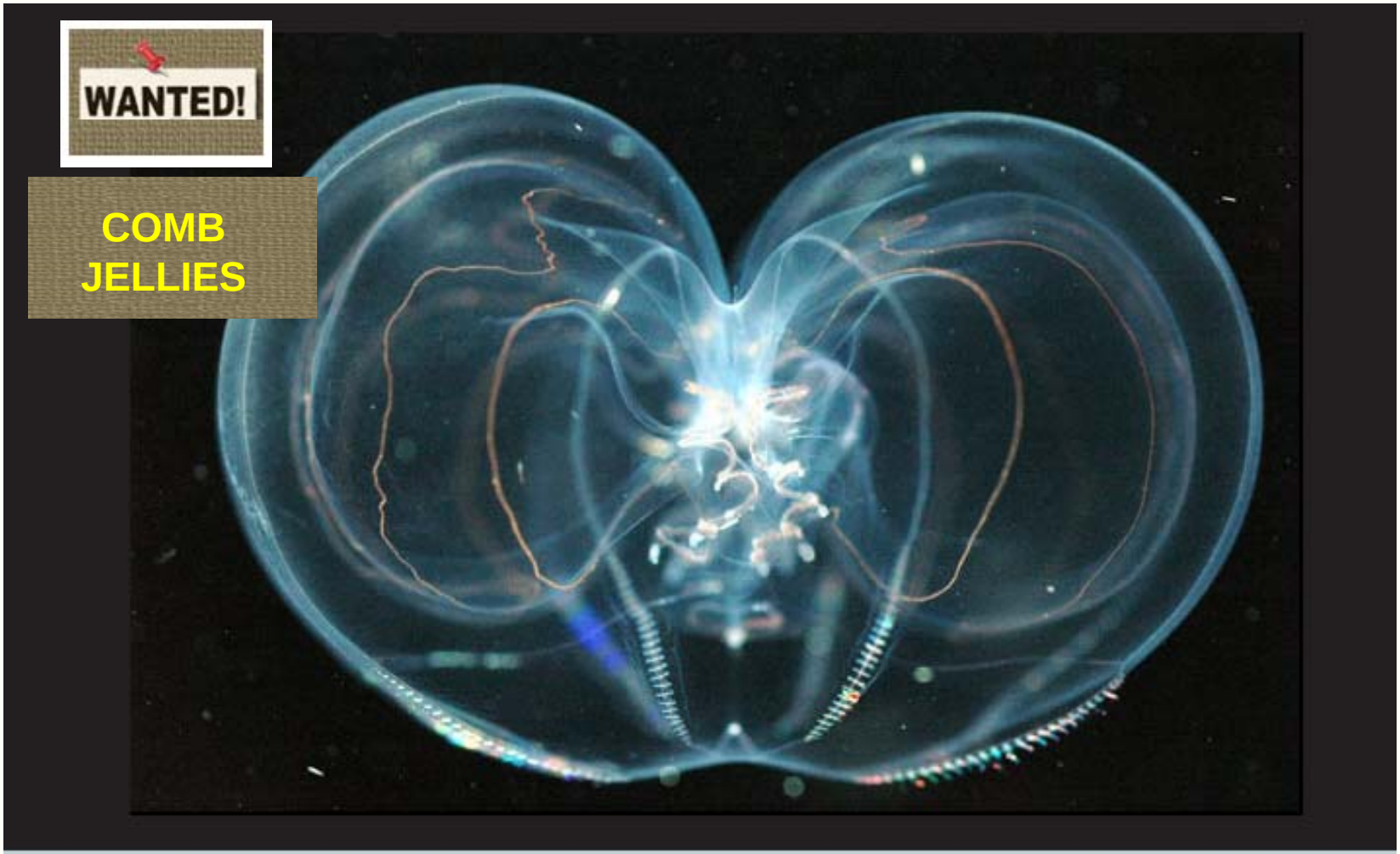
July/August 2008

DRILLING CONTRACTOR

Invasive Species (example)



In 1993, **Comb jellies** were introduced to the Black Sea from the United States in shipping ballast water. The species destroyed commercial fishing, costing thousands of jobs. At its peak in the mid-1990s, the comb jelly plague made up 90 percent of all living organisms in the Black Sea, exceeding the weight of the entire world fish catch. © L. Madin, Woods

Invasive Species (example)

Caulerpa is a tropical seaweed that has wreaked havoc in the Mediterranean and in Australia. Once established, it is quickly transported on the anchors of fishing and recreational boats. It overgrows native seagrass and is toxic to many fish. When a population was discovered in a California harbor in 2000, reactions were rapid. Six years and over $4 million

Invasive Species (example)

Northern Pacific seastars were likely introduced in a ship's ballast water to Australia about 20 years ago. They have invaded the southern coastline and are spreading towards Sydney. They form dense aggregations, in some regions reaching up to 1100 individual seastars in a cubic meter of water. While they prefer shellfish, these predators are not

Invasive Species (example)

The **European green crab**, a voracious predator of shellfish and small crustaceans, dominates the habitats it invades. This crab invades quickly and can outcompete native crabs and birds for food. It also causes declines in ecologically and commercially important species, including causing the collapse of the soft-shell clam fishery in Maine. © Andrew Cohen.

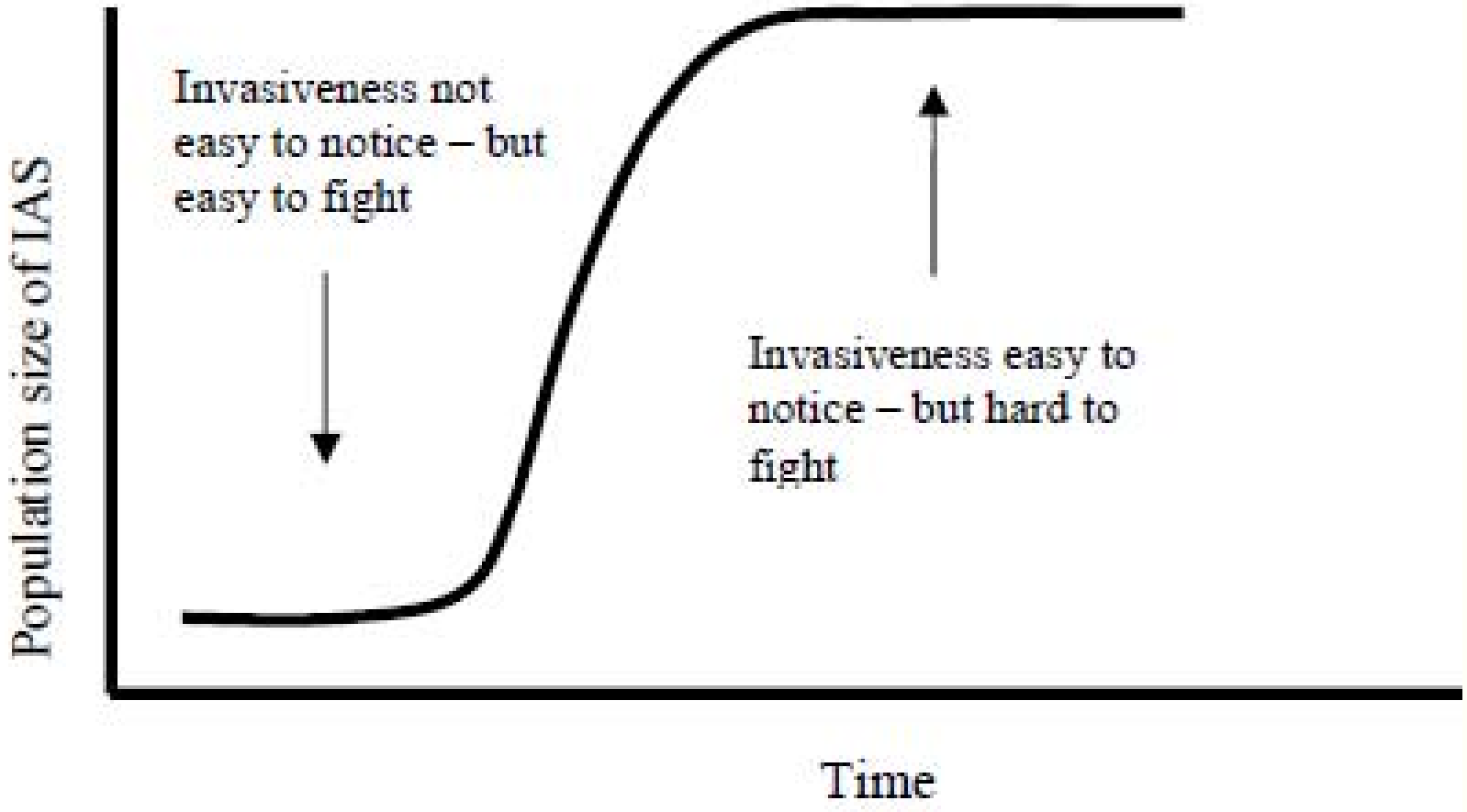
Invasive Species (example)

With long, delicate spines that contain powerful venom, **lionfish** have recently invaded the waters of the Caribbean and southeast US. Likely introduced via ships or released from aquariums, these species have no known local predators. Scientists are still determining the extent of the damage from this recent invasion. While not lethal to humans, the

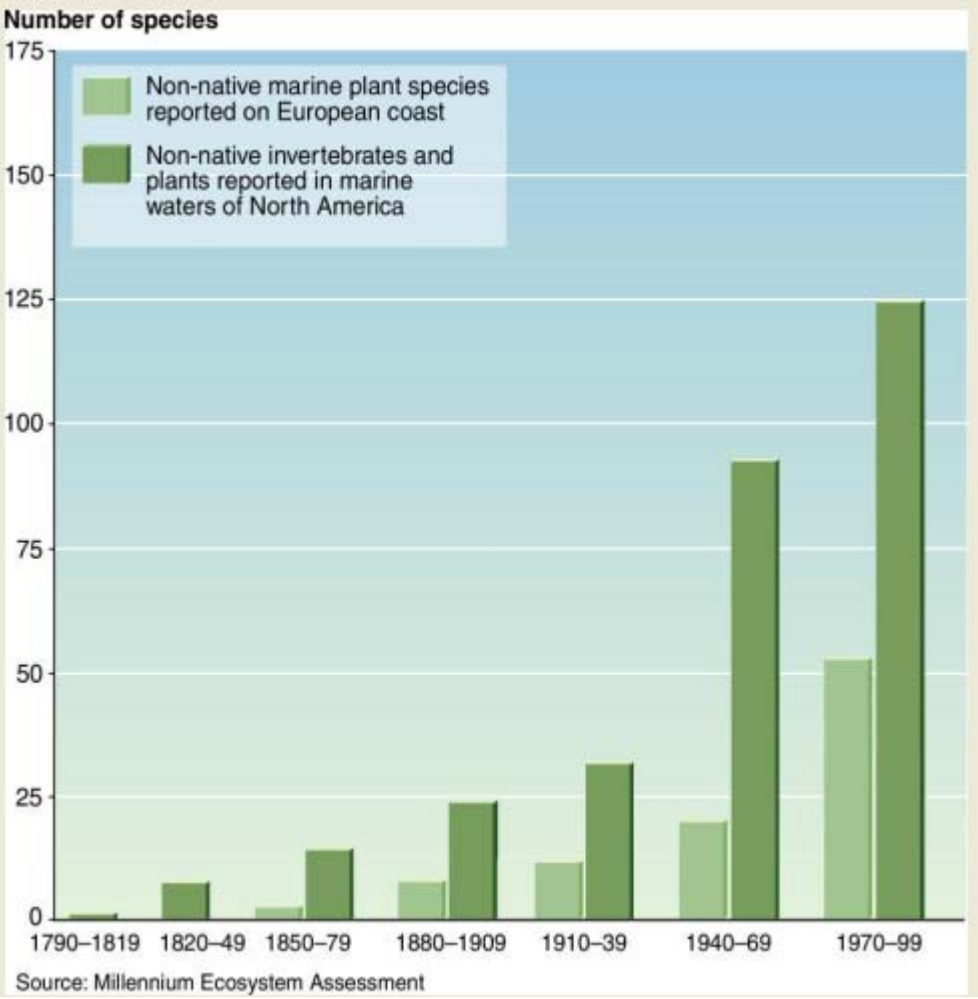
Invasive Species (example)

Introduced in 1979 via shipping, the **Mediterranean mussel** has become the dominant species on rocky shores on the west coast of southern Africa. This fast growing species can blanket the intertidal zone, reaching densities of up to 50 kg (110 pounds) in a square meter. It displaces native mussels and other species, with substantial ecological and economic

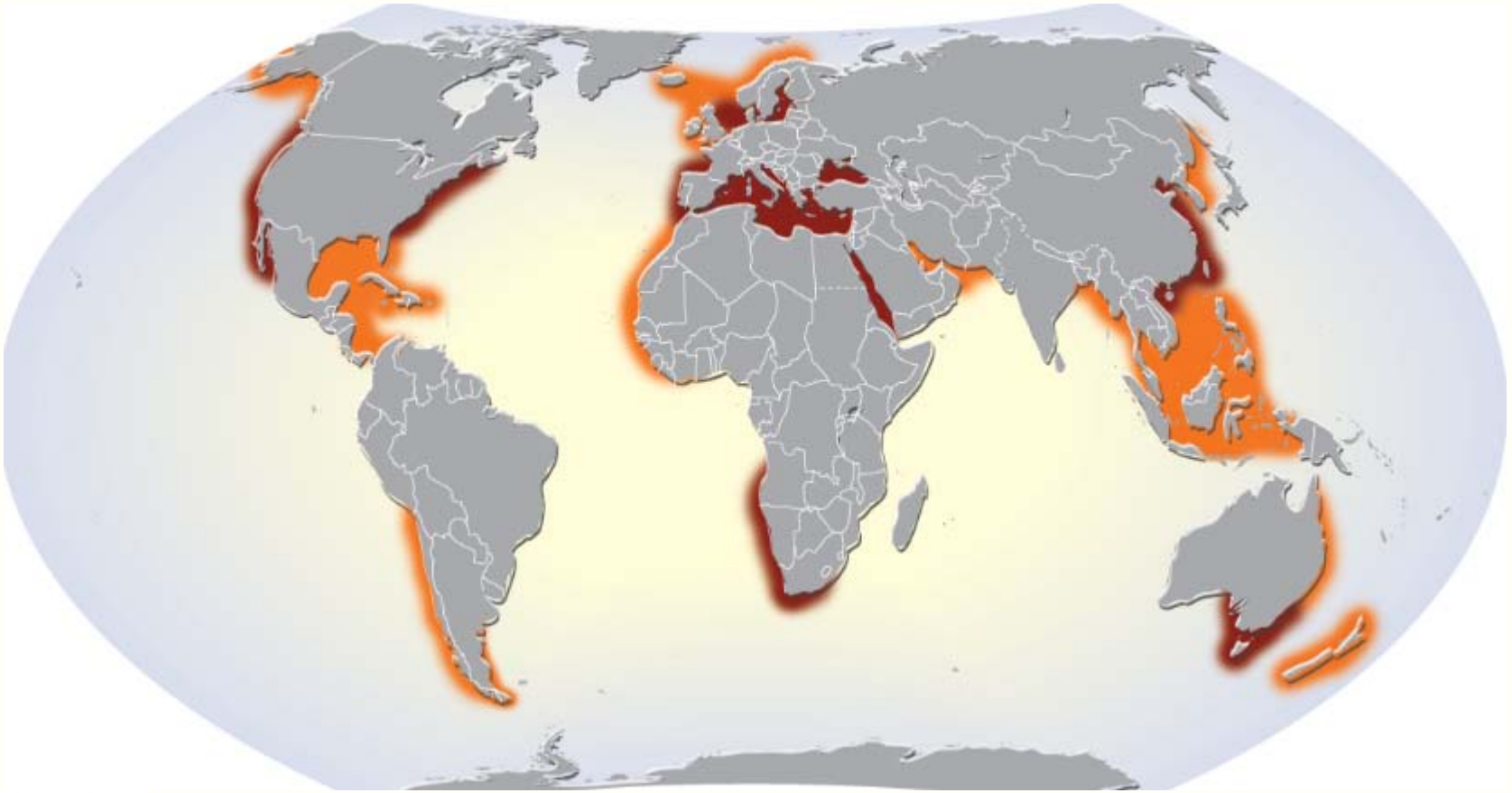
Usual pattern of biological invasion



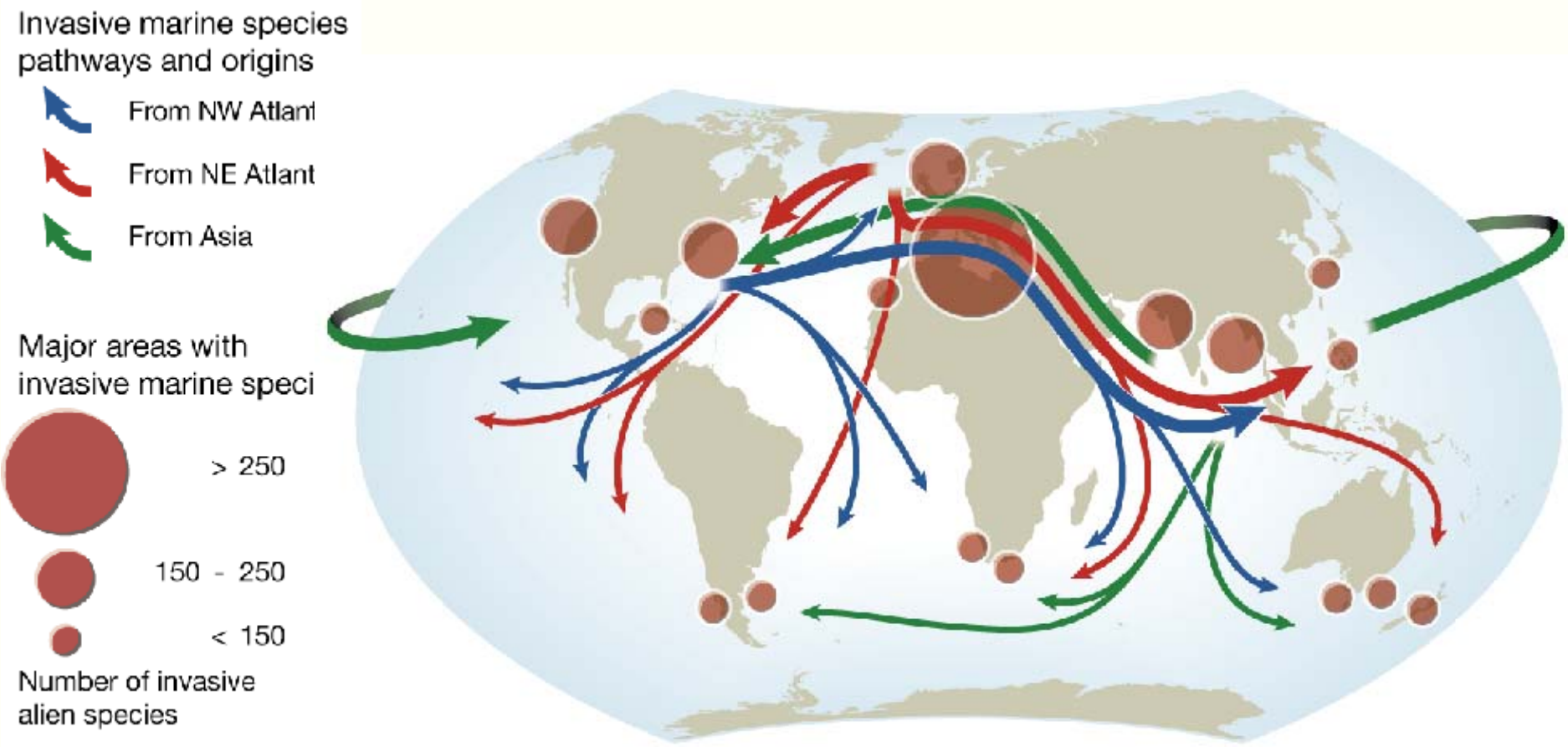
Growth in number of marine species introduction



Hot spots


Invasive marine species hotspots
Widespread presence
Medium presence

Major Pathways



Vectors (UK…but generally representative)

Ballast water and hull fouling

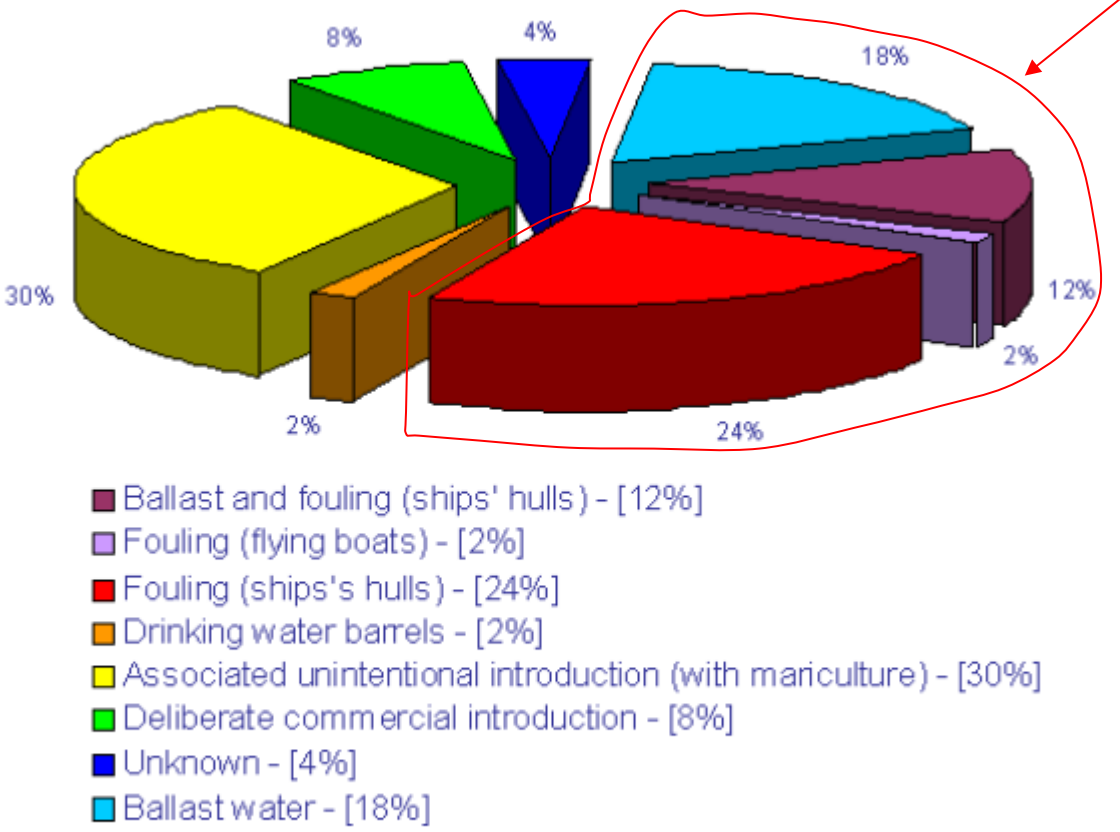
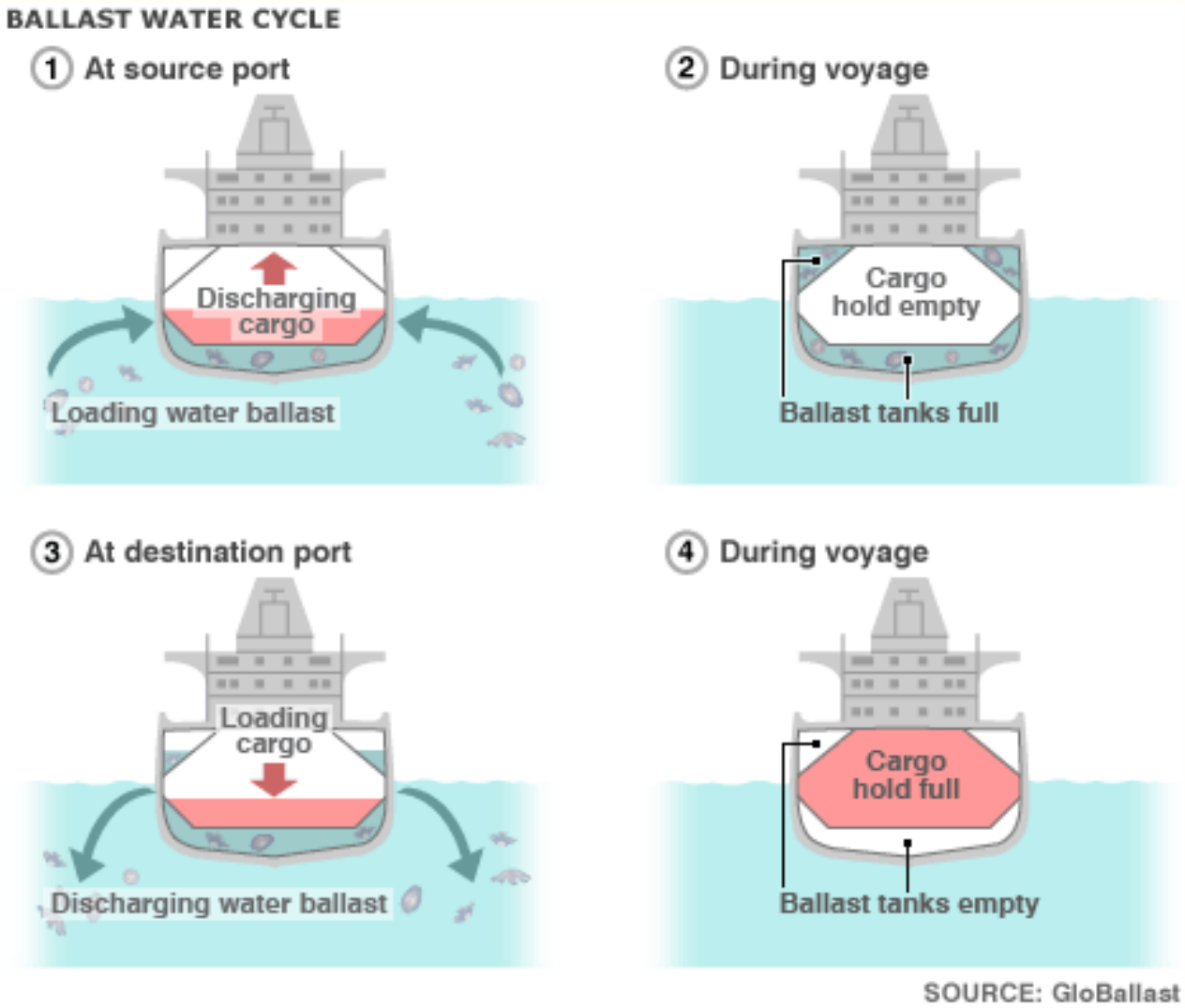


Figure 1. Probable methods of introduction of non-native marine fauna and flora found in British waters (Eno et al., 1997).

Ballast Water



Hull and legs Fouling

Rig's Move…



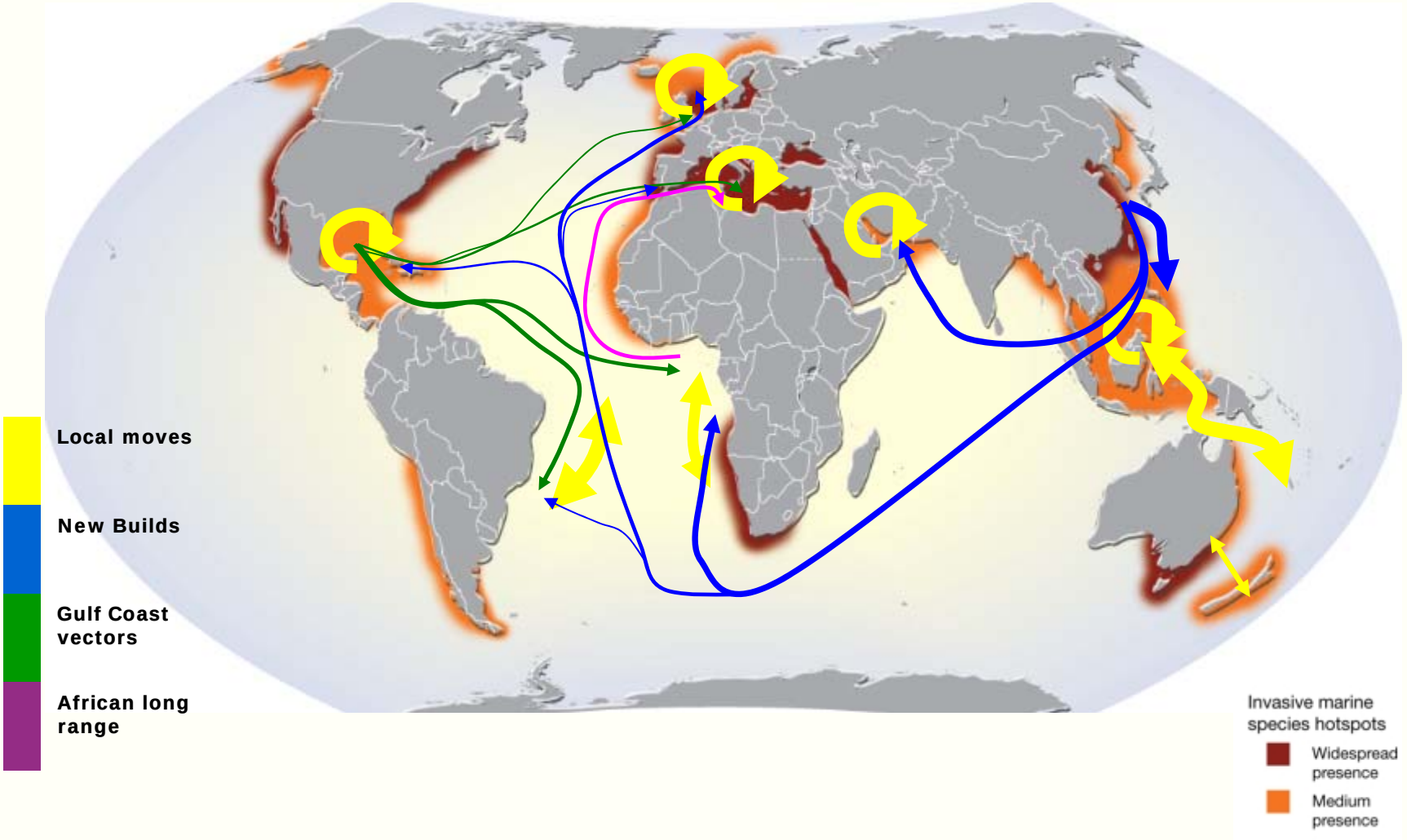









Hot spots vs. Rig Movement



Case Study – Rig Move

Noble Homer Ferrington — Rig Specifications

General	
Rig Type	Semisubmersible
Rig Design	Friede & Goldman 9500 Enhanced Pacesetter
Built By	Vyborg Shipyard, Vyborg USSR
Year Constructed	1985;1999; 2004
Water Depth Rated	6000
Drilling Depth	30,000ft
Hull Dimensions	254' x 225' x 80'
Draft, Operating	55'
Draft, Transit	19'
Draft, Storm	40'
Heliport	Sikorsky S61

Moving from Ivory Coast to Libya

Route


Approximate Travel Route
Morocco
Algeria
Libya
Western Sahara
Mauritania
Mali
Niger
Chad
Nigeria
Cameroon
Ghana
Burkina Faso
Guinea
Sierra Leone
Liberia
Côte d'Ivoire
Togo
Benin
Spain
Portugal
Tunisia

Information gathering

EP

United Nations Environment Programme

UNEP(DEPI)/MED IG.17/Inf.17
23 July 2007

ENGLISH

MEDITERRANEAN ACTION PLAN

15th Ordinary Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols

Almeria (Spain), 15-18 January 2008

GISP
The Global Invasive Species Programme

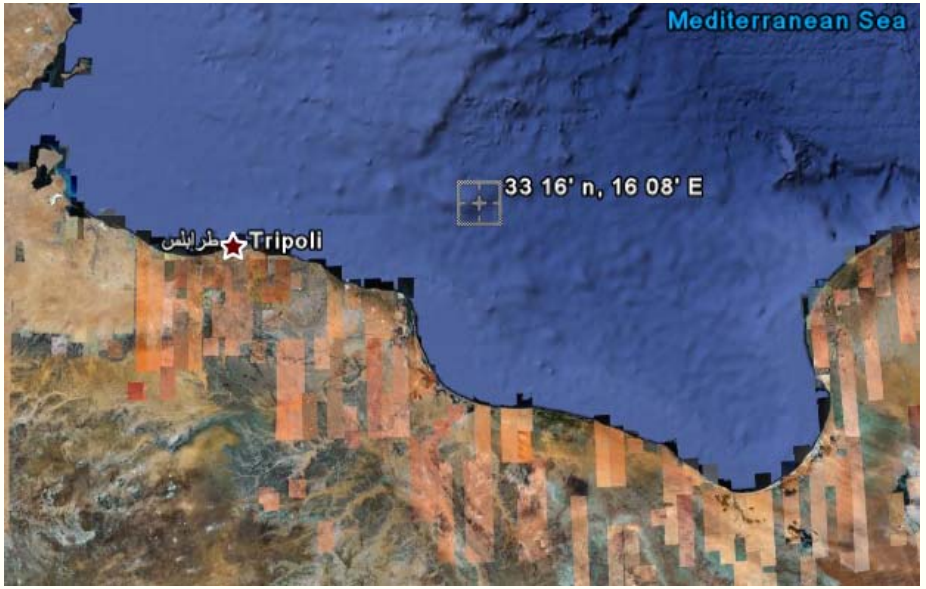
UNEP Regional Seas

Guidelines for Controlling the Vectors of Introduction into the Mediterranean of Non-Indigenous Species and Invasive Marine Species

Guide for Risk Analysis Assessing the Impacts of the Introduction of Non-Indigenous Species

GLOBAL INVASIVE SPECIES DATABASE

Marine environments evaluation

Donor Location	Recipient Location
	
4000 Ft of water (aprox.) 50 Km away from nearest shore Previously away + 100Km aprox. Same water depths	4000 Ft of water (aprox.) +100 Km away from nearest shore

Search on invasive species issues

You searched for invasive species in marine habitats in west africa:

3 invasive species found

Alien Species

1. *Schizoporella errata* (bryozoan)
   Schizoporella errata is a heavily calcified, encrusting cheilostome bryozoan. It colonises most freely available substratum, including artificial underwater structures and vessel hulls. Colonies may reach 25cm in height and are widely varying in growth form, sometimes dominating space in fouling assemblages.
   Common Names: branching bryozoan, bryozoan, cheilostome bryozoan, encrusting bryozoan
   Synonyms: *Lepralia errata*
2. *Vibrio cholerae* (micro-organism)
   Vibrio cholerae is the bacteria that causes cholera; a potentially epidemic and life-threatening secretory diarrhea characterised by numerous, voluminous watery stools, often accompanied by vomiting and resulting in hypovolemic shock and acidosis. It can also cause mild or unapparent infections. Vibrio cholerae occurs in both marine and freshwater habitats in mutualistic associations with aquatic animals. Vibrio cholerae is endemi or epidemic in areas with poor sanitation; it occurs sporadically or as limited outbreaks in developed countries. Cholera is transmitted by the fecal-o route. In coastal regions it may persist in shellfish and plankton. Long-term convalescent carriers are rare.
   Common Names: Asiatic cholera, epidemic cholera

Biostatus not specified

1. *Watersipora subtorquata* (bryozoan)
   Watersipora subtorquata (d'Orbigny, 1852) is a loosely encrusting bryozoan. It is tolerant to copper based anitfouling coatings and is infamous for fouling ships hulls and facilitating the fouling and spread of other marine invasives. Watersipora subtorquata is considered cosmopolitan and widely

GLOBAL INVASIVE SPECIES DATABASE

Schizoporella errata

Schizoporella cf. errata **(Waters, 1878)**

Branching bryozoan

Phylum Ectoprocta
Class Gymnolaemata
Order Cheilostomata
Family Schizoporellidae

Description

This heavily calcified encrusting bryozoan is typically dark brick red with orange-red growing margins. It assumes the shape of whatever it overgrows. This species may form heavy knobby incrustations on flexible surfaces such as algae or worm tubes, turning them into solid, sometimes erect branching structures. The thickness of the growth is dependent upon the age of the colony. Multilaminar encrustations of 1 cm thick are common. The frontal surface of the zoecium (secreted exoskeleton housing of individual zooids) is porous with a wide semicircular aperture and proximal sinus. Also with single avicularia on right or left side of aperture sinus.

Habitat

As fouling in shallow water on hard substrates (pilings, hulls, coral rubble, etc.) in harbors and embayments. Occasionally found on the reef, especially in Kaneohe Bay.

Distribution

Hawaiian Islands

Throughout the main islands and Midway Atoll.

Native Range

Mediterranean

Present Distribution

Probably worldwide in warm temperate-subtropical seas (reported from West Africa, Red Sea, Persian Gulf, South Australia, New Zealand, Hawaiian Islands, Pacific Coast of North America, East Coast North America through Caribbean to Brazil, and Mediterranean).

SEM of *Schizoporella errata*. showing (1) aperture, and (2) avicularia (from Soule et al. 1987).

Mechanism of Introduction

Unintentional, as fouling on ships' hulls

Being native to the Mediterranean it poses no threat on this case

Vibrio cholerae

ii. Electron Micrograph of Vibrio cholerae

Cholera, sometimes known as **Asiatic** or **epidemic cholera**, is an infectious gastroenteritis caused by enterotoxin-producing strains of the bacterium *Vibrio cholerae*.[1][2] Transmission to humans occurs through eating food or drinking water contaminated with *cholera vibrios*. The major reservoir for cholera was long assumed to be humans themselves, but considerable evidence exists that aquatic environments can serve as reservoirs of the bacteria.

Habitat in rivers estuaries or shallow waters…it may persist in shellfish and in plankton

Specially at risk are ships or rigs on ports up taking ballast water

Watersipora subtorquata

Because its larvae spend less than a day in the plankton before settling, *Watersipora subtorquata* could not have been transported long distances as larvae in currents or in ballast water

Watersipora subtorquata - a bay invader

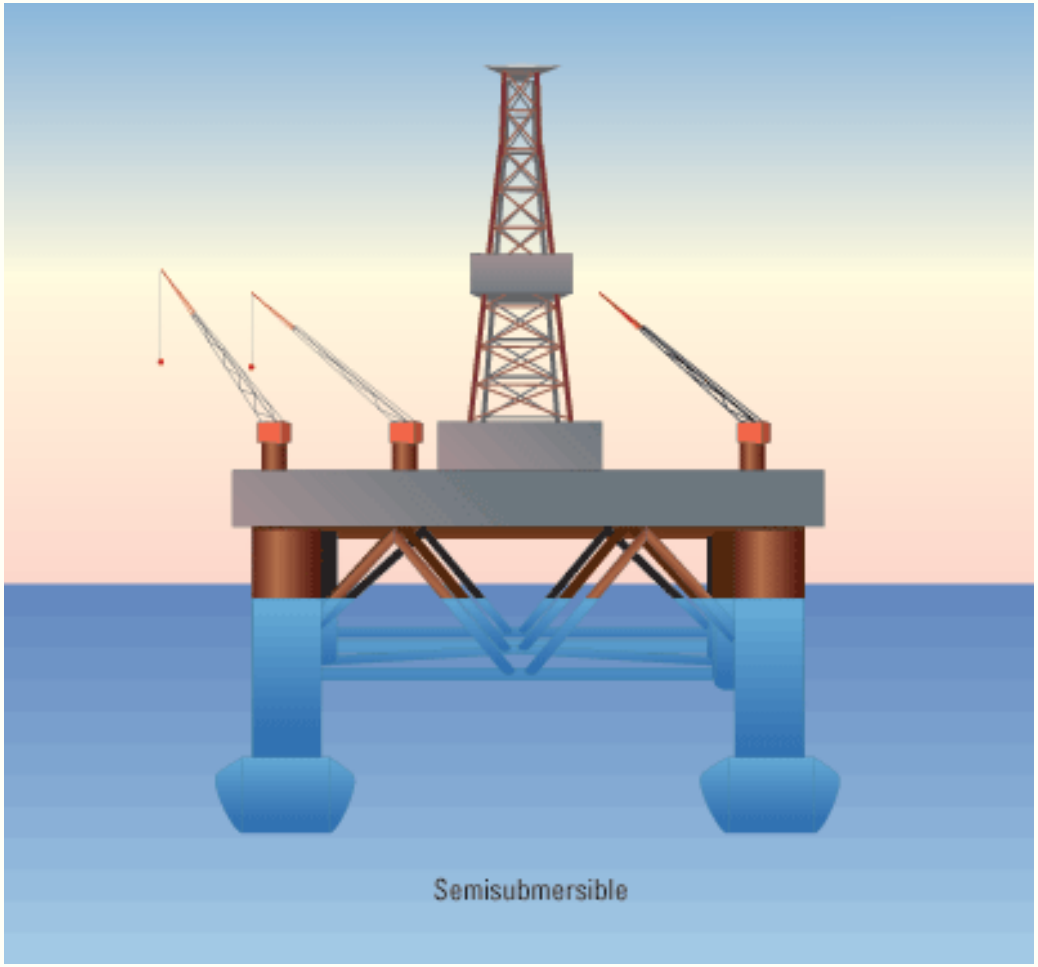
ALL SIZES

A bryozoan (Watersipora subtorquata). Closer view of a smaller orange Watersipora subtorquata colony from San Francisco Bay. This species has often been reported from vessel hulls. It is less sensitive to copper than many fouling organisms, and is therefore less affected by a class of anti-fouling paints. Native range unknown.

Previously in the Mediterranean Sea

[reported in 1854 in the Aegean Sea and 1886 in the Adriatic Sea],

Hull Survey



Experts opinion sought

UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN
for the Barcelona Convention

Contact

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48, Vassileos Konstantinou Ave.
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Tel.: +30 210 7273100
Fax: +30 210 7253196-7
E-mail: unepmedu(at)unepmap.gr

UNEP

United Nations Environment Programme

environment for development

Regional Seas Programme
United Nations Environment Programme (UNEP)
Division of Environmental Policy Implementation
P.O Box 30552, Nairobi, Kenya
Tel: +254 20 762 4033
Fax: +254 20 762 4618
Email: regionalseas@unep.org

Regional Seas

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GISP

The Global Invasive Species Programme

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Email: s.simons@gisp.org
Tel: +254 20 722 4462/50
Fax: +254 20 712 2150

The Decision

- Risk + cost vs. benefit analysis for Hull Cleaning was negative =

  No Hull Cleaning

- Risk + cost vs. benefit analysis for Ballast Management was positive =

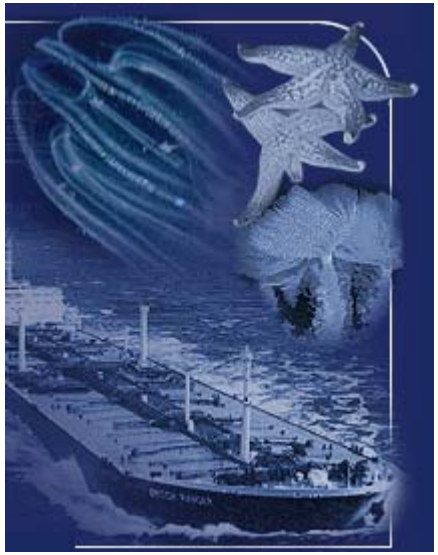
  Go ahead with Ballast Management

The Guidelines

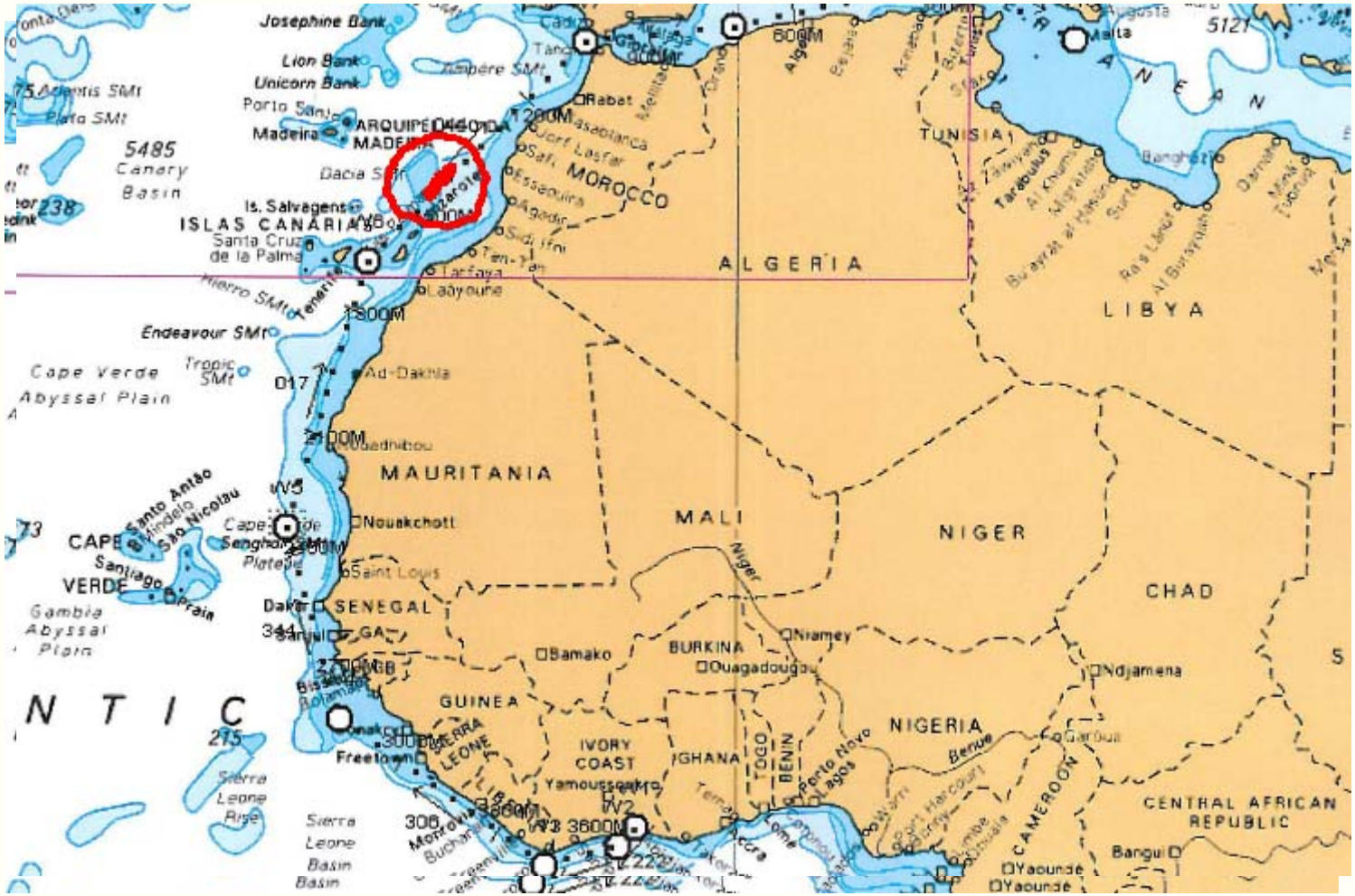
http://Globallast.imo.org

The IMO Guidelines

Resolution A.868(20)



The Location



The Paperwork

R

70 Appendix 1 - BALLAST WATER REPORTING FORM (TO BE PROVIDED TO PORT STATE AUTHORITY UPON REQUEST)

1. VESSEL INFORMATION

2. BALLAST WATER

Vessel Name:	Type:	IMO Number:	Specify Unit: m³, MT, LT, ST
Owner:	GT:	Call Sign:	Total Ballast Water on Board:
Flag:	Arrival Date:	Agent:	
Last Port and Country:		Arrival Port:	Total Ballast Water Capacity:
Next Port and Country:			

3. BALLAST WATER TANKS BALLAST WATER MANAGEMENT PLAN ON BOARD? YES____ NO____ HAS THIS BEEN IMPLEMENTED?

TOTAL NO. OF TANKS ON BOARD_____ NO. OF TANKS IN BALLAST_____ IF NONE IN BALLAST GO TO NO. 5 YES____ NO____

NO. OF TANKS EXCHANGED_____ NO. OF TANKS NOT EXCHANGED_____

4. BALLAST WATER HISTORY: RECORD ALL TANKS THAT WILL BE DEBALLASTED IN PORT STATE OF ARRIVAL; IF NONE GO TO NO. 5

Tanks/Holds (list multiple sources/tanks separately)	B/W SOURCE				B/W EXCHANGE: circle one: Empty/Refill or Flow Through					B/W DISCHARGE			
	DATE ddmmyy	PORT or LAT. LONG	VOLUME (unit)	TEMP (unit)	DATE ddmmyy	MIDPOINT LAT, LONG.	VOLUME (unit)	% Exch.	SEA Hgt. (m)	DATE ddmmyy	PORT or LAT. LONG.	VOLUME (unit)	SALINITY (unit)

Ballast Water Tank Codes: Forepeak=FP, Aftpeak=AP, Double Bottom=DB, Wing=WT, Topside=TS, Cargo Hold=CH, O=Other

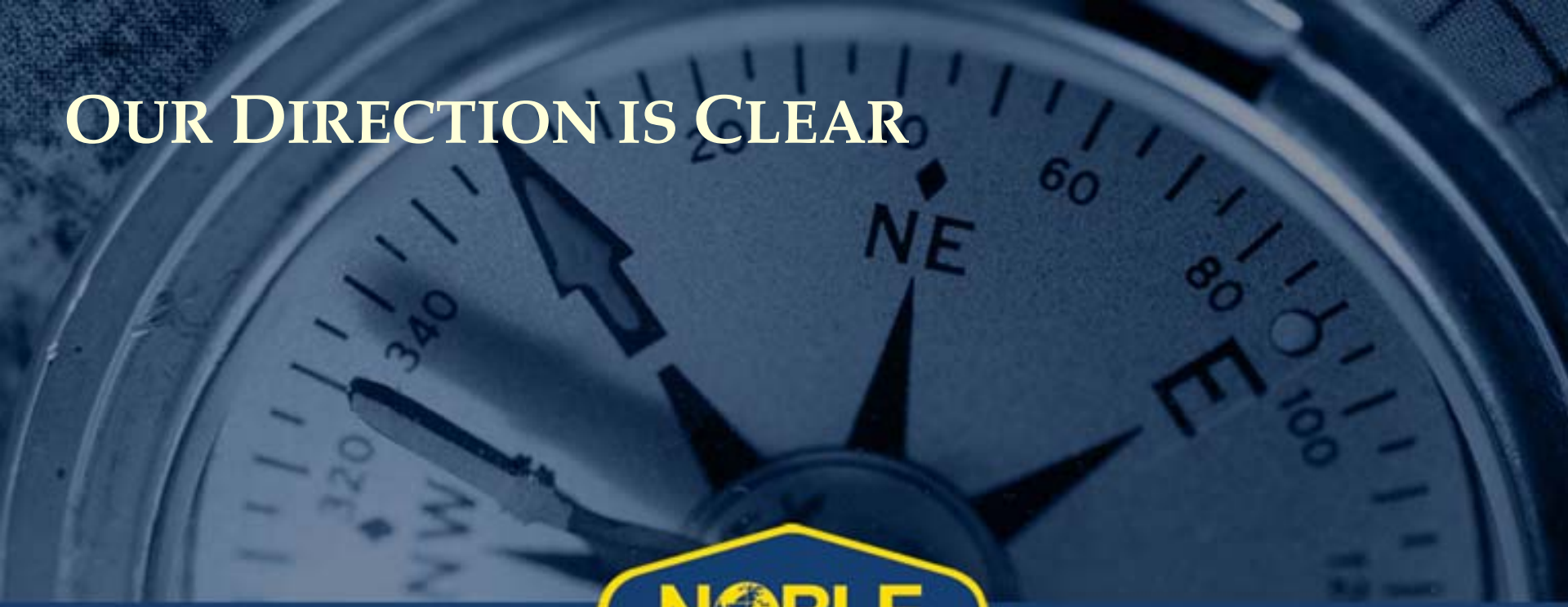
IF EXCHANGE(S) WERE NOT CONDUCTED, STATE OTHER CONTROL ACTION(S) TAKEN: _____

IF NONE, STATE REASON WHY NOT: _____

5. IMO BALLAST WATER GUIDELINES ON BOARD (RES. A.868(20))? YES____ NO____

RESPONSIBLE OFFICER'S NAME AND TITLE (PRINTED) AND SIGNATURE: _____

Our Direction is Clear



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