Environmental Atrocities in the South China Sea: the Science Behind Conservation Recourse

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Outline

- Case background (RP vs. PRC)

- Permanent Court of Arbitration (PCA) & Hearings

- UNCLOS & the environmental damage in South China Sea

- The science: Fragile ecosystems, threatened species, connectivity

- Giant Clam extraction evidence subsequent to PCA hearings

- The Tribunal decision July, 2016

Case Background: The Republic of the Philippines vs. The People's Republic of China

- Mostly a territorial dispute under United Nations Convention on the Law of the Sea (all signatories)

- Environmental component added because of PRC fishing activities & island building activities
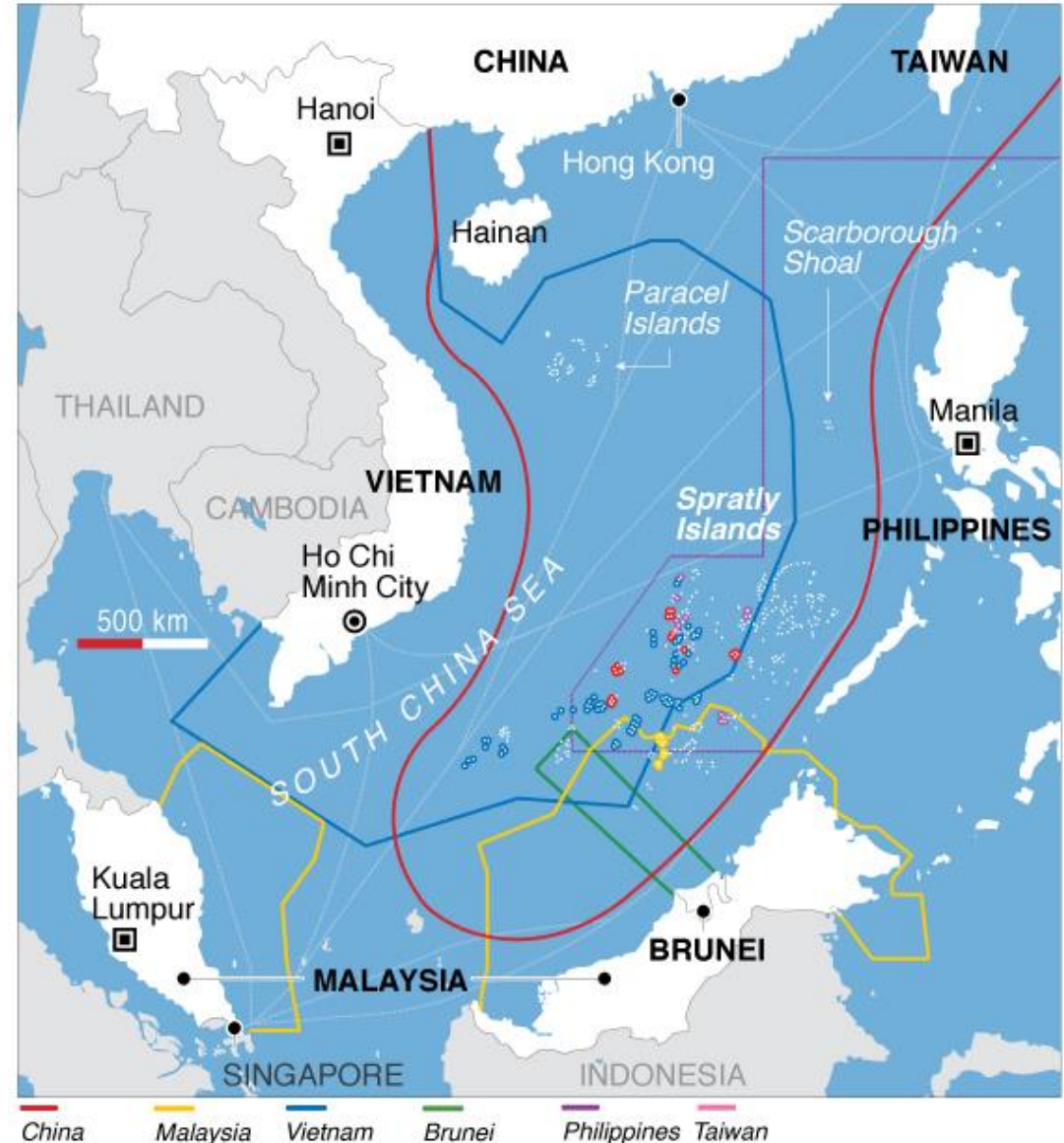
Complicated Case Timeline: RP vs. PRC. The so-called "Nine-Dash Line"

2002 — • initial talks under ASEAN

2009

01/13 — • RP initiates PCA/UNCLOS case
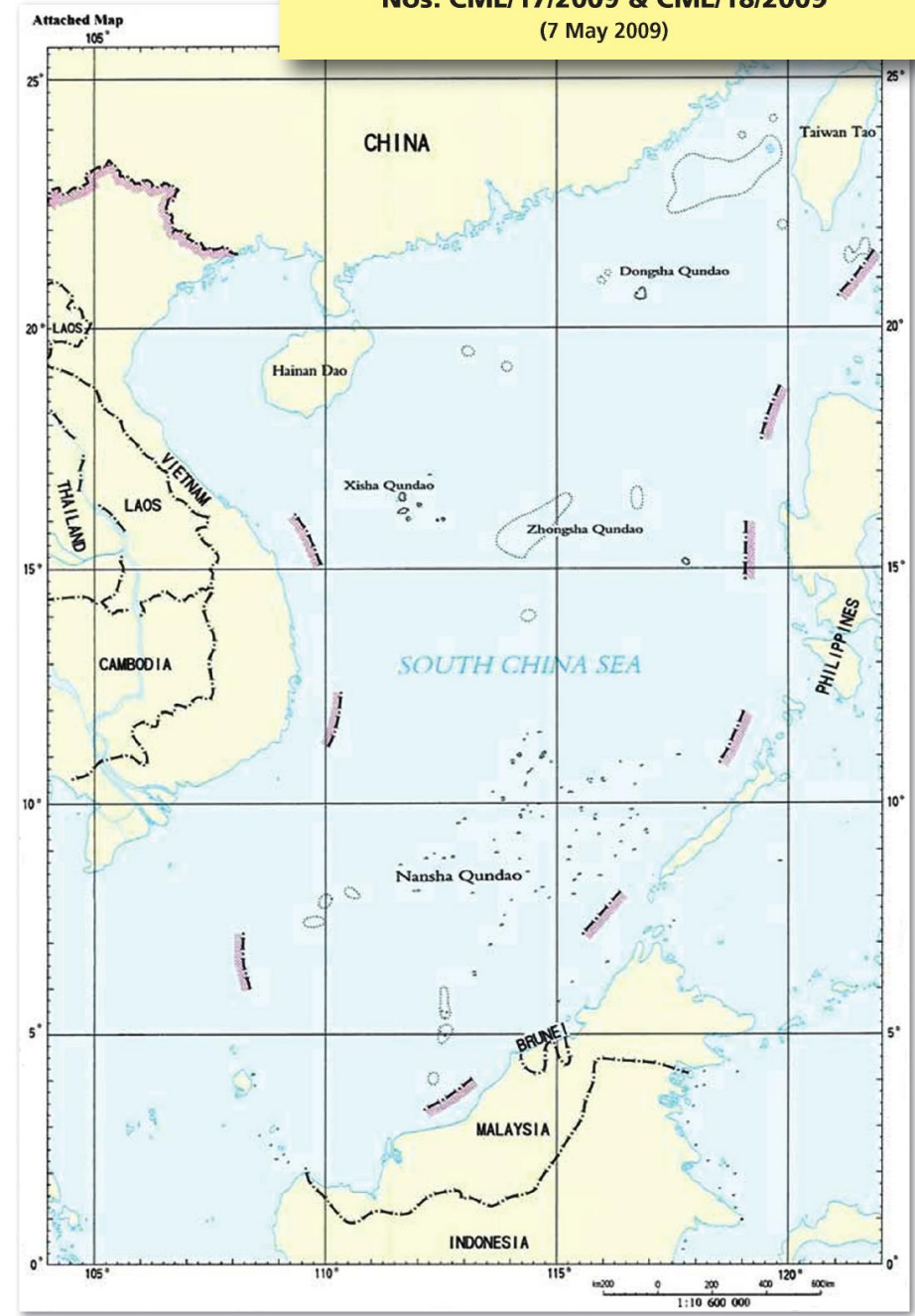
08/13

03/14

06/14

12/14

07/15
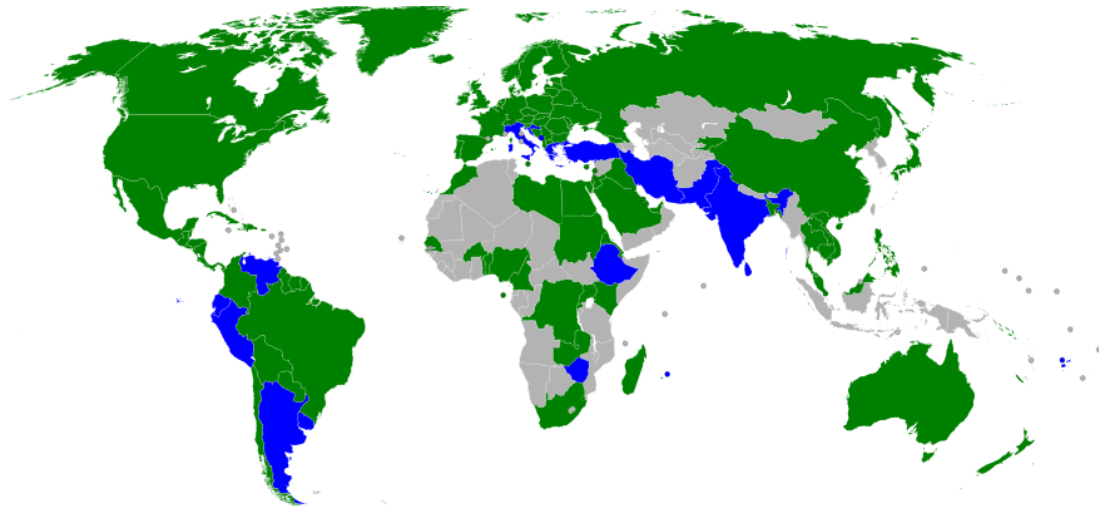
10/15
11/15 — • PCA convenes hearing

Permanent Court of Arbitration

- Peace Palace in Den Hague, The "World Court"

- PCA oldest international court
  - 1899 Hague Peace Conference
  - 120 member countries

The Hearings

- The Tribunal

The Hearings

- **Philippine Delegation**
  3 components:

  1) Philippine Government (Chair National Defense, ambassadors, Supreme Court Justice)

The Hearings

- Philippine Delegation headed by Solicitor General Florin Hilbay & Secretary of Foreign Affairs Albert Del Rosario

The Hearings

2) Counsel Team for the Philippines: Foley Hoag LLP & Legal consultants

The Hearings

3) Two expert witnesses
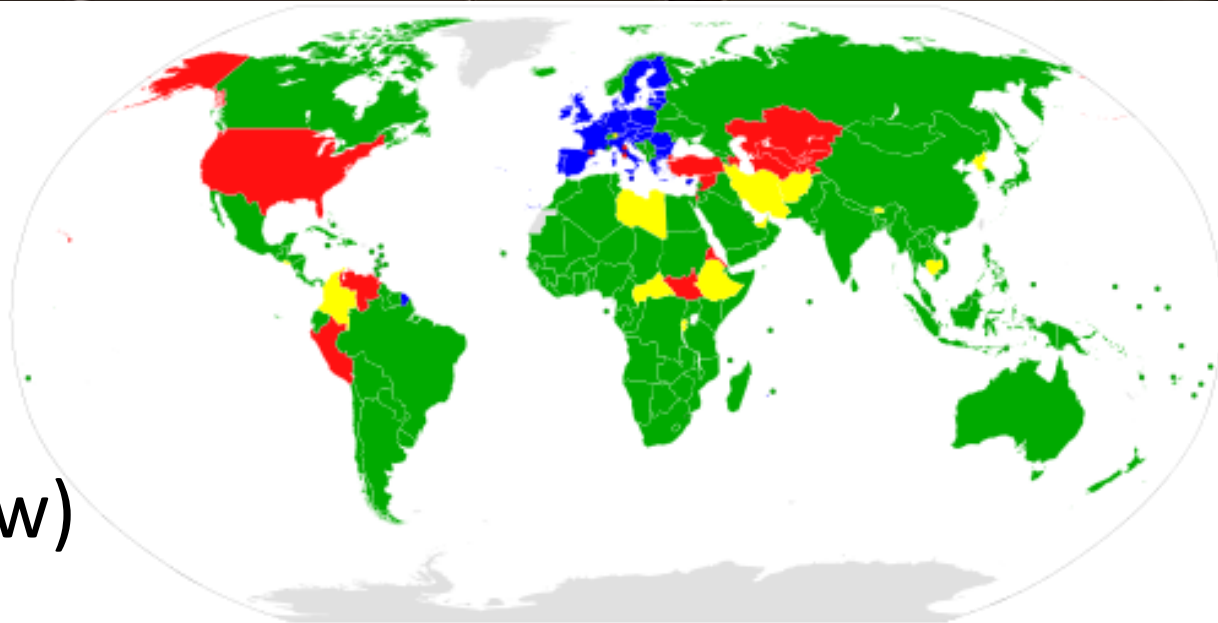- Environment
- Definition of an island
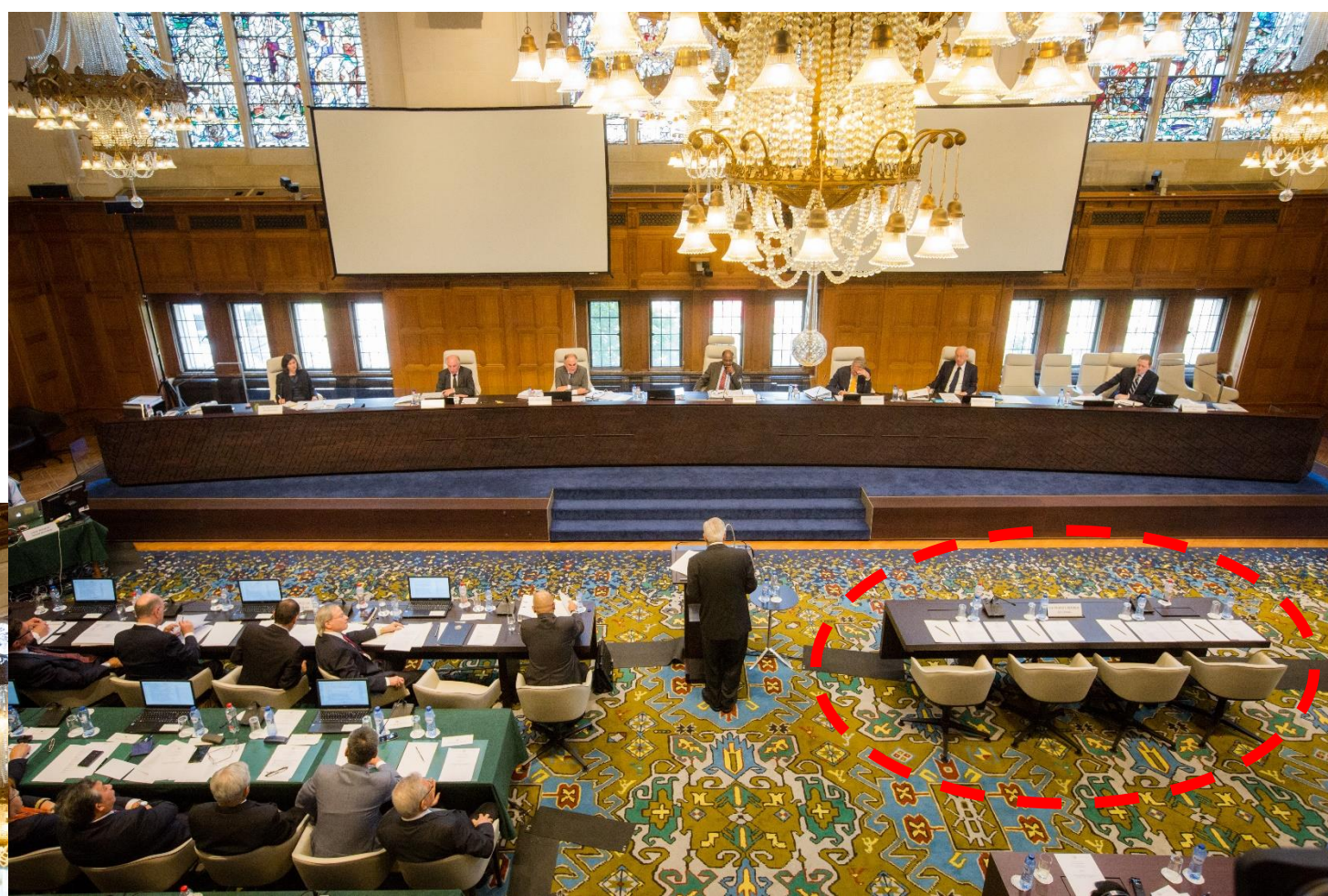
The Hearings

- Observers

UNCLOS
signatory
countries
(blue, green, yellow)

The Hearings

- PRC Delegation

UNCLOS & the Marine Environment

- Part XII
  - *Article 192. General obligation*. States have the obligation to protect and preserve the marine environment.
    - using …. means … in accordance with …. their policies
    - are so conducted as not to cause damage by pollution to other States and their environment, and …. does not spread beyond the areas where th exercise sovereign rights.

UNCLOS & the Marine Environment

- Part XII
  - *Article 194. Measures to prevent, reduce and control pollution of the marine environment….*
    - 5. The measures taken in accordance with this Part 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.

(…… Conservation Biology)

UNCLOS & the Marine Environment

- Part XII
  - *Article 192. General obligation*. States have the obligation to protect and preserve the marine environment.
    - using …. means … [1] in accordance with …. their policies
    - are so conducted as not to cause damage by pollution to other States and their environment, and …. [5] does not spread beyond the areas where they exercise sovereign rights.
  - *Article 194. Measures to prevent, reduce and control pollution of the marine environment….*
    - 5. The measures taken in accordance with this Part shall include those necessary to [4] protect and preserve rare or [3] fragile ecosystems as well as the habitat of depleted, [2] threatened or endangered species and other forms of marine life.

1) **Where sovereign policies met?**
2) **Were threatened species protected?**
3) **Are coral reefs in the South China Sea fragile ecosystems?**
4) **Were coral reefs protected (or damaged?)**
5) **Would the damage potentially spread to other States?**

1. Were sovereign policies followed?

- Was an environmental impact statement done? Plans to mitigate any harm from island building activities?
  - Evidence indirectly put forward by PRC was a handbook on monitoring pollution in coastal waters
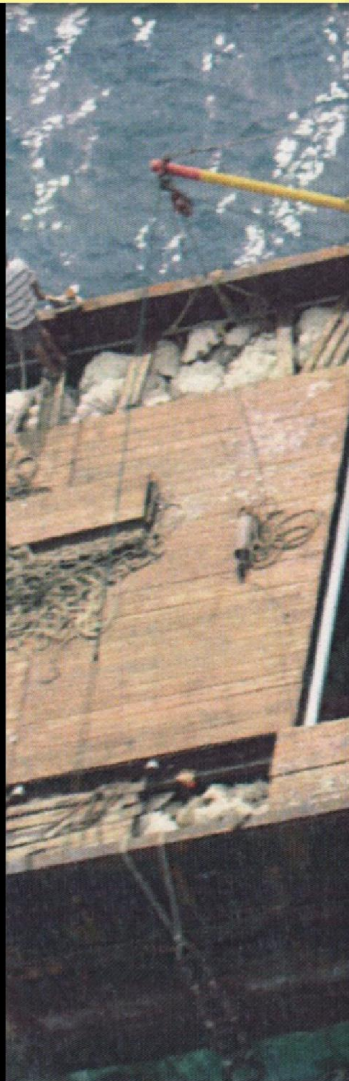 - No actual evidence that an EIS was completed
  - ?:

NO!

2. Were threatened species protected?

- Photographic & eye witness evidence: threatened (under IUCN Red List Criteria) and/or protected (under CITES agreements) species exploited/harmed: corals, giant clams, elasmobranchs, groupers, sea turtles
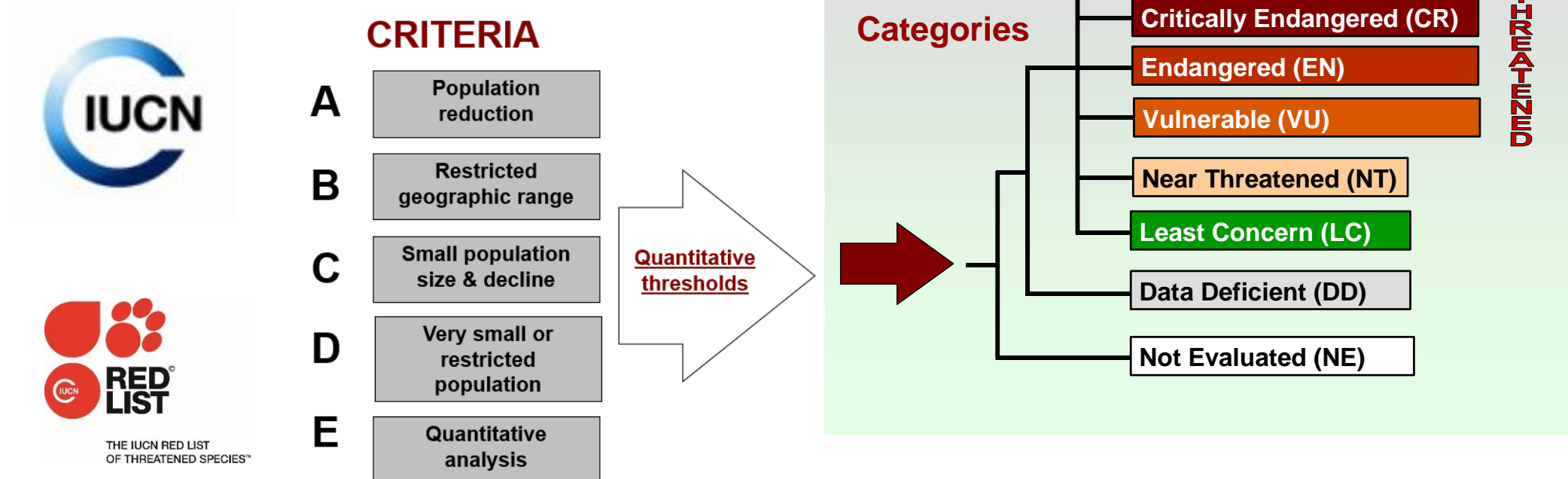
Giant clams protected under CITES & assessed as threatened
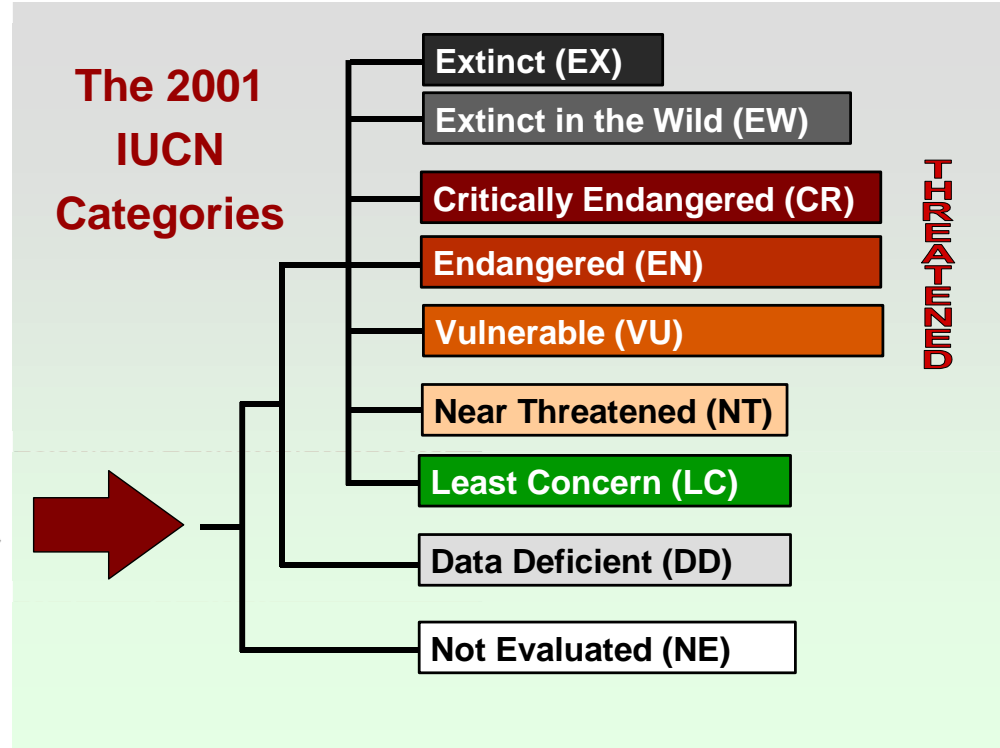
PM Figures 6.7

(Boyle 3) Figure 1

2. Were threatened species protected?

CRITERIA

A — Population reduction

B — Restricted geographic range

C — Small population size & decline

D — Very small or restricted population

E — Quantitative analysis

Quantitative thresholds

The 2001 IUCN Categories

Extinct (EX)

Extinct in the Wild (EW)

Critically Endangered (CR)

Endangered (EN)

Vulnerable (VU)

Near Threatened (NT)

Least Concern (LC)

Data Deficient (DD)

Not Evaluated (NE)

THREATENED

THE IUCN RED LIST OF THREATENED SPECIES

NO!

3. Are Coral Reefs "Fragile Ecosystems" and therefore UNCLOS requires protection?
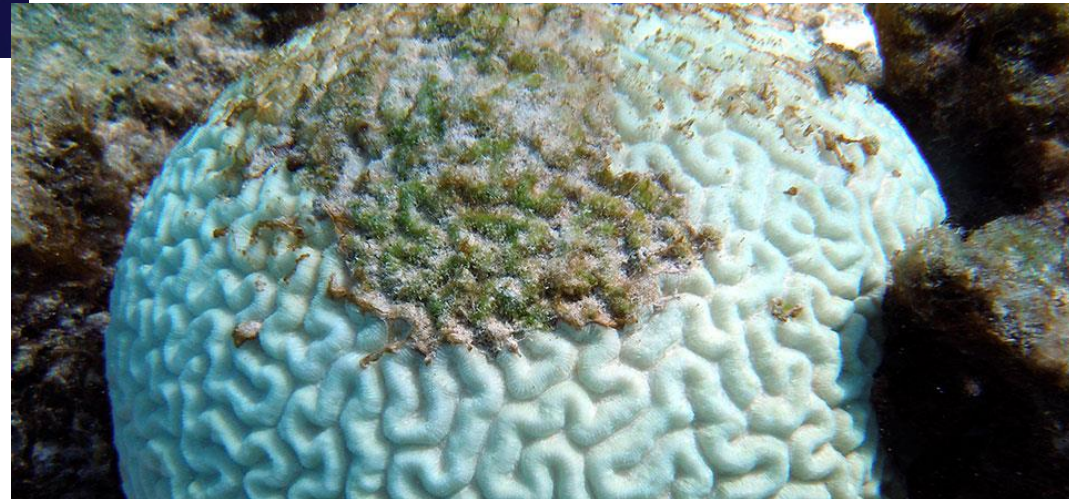
- Well established… <u>require clear water</u>…long recovery times
(5-10 years or decades if substrate disturbed)

- ?:
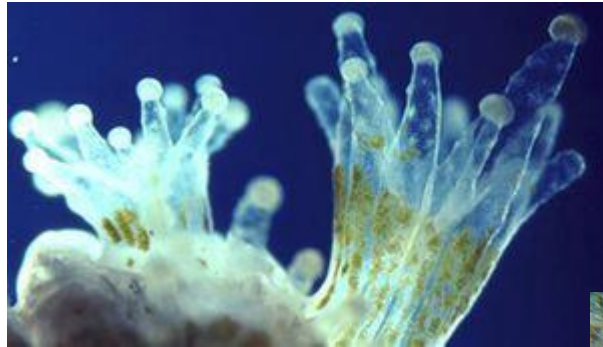
YES!

4. Were coral reefs protected or damaged?

- Satellite imagery of dredging operations speaks for itself …..

SATELLITE IMAGE
OF MISCHIEF REEF
(24 January 2012)

Annex 792, Supplemental Written Submission of the Philippines

(Carpenter2) Figure 3

SATELLITE IMAGE
OF MISCHIEF REEF
(16 March 2015)

Annex 792, Supplemental Written Submission of the Philippines

(Loewenstein 2) Figure 12

TIAN JING HAO CUTTER SUCTION DREDGER

From Expert Report of Kent E. Carpenter and Loke Ming Chou, PhD

(Loewenstein 2) Figure 6

Sediment is broken up and **sucked** from the seabed.

Material is **transported** through a floating pipe.

Dredged material is **deposited** on the reef.

Anchor pole

Ocean floor

Submerged reef

(Loewenstein 2) Figure 5
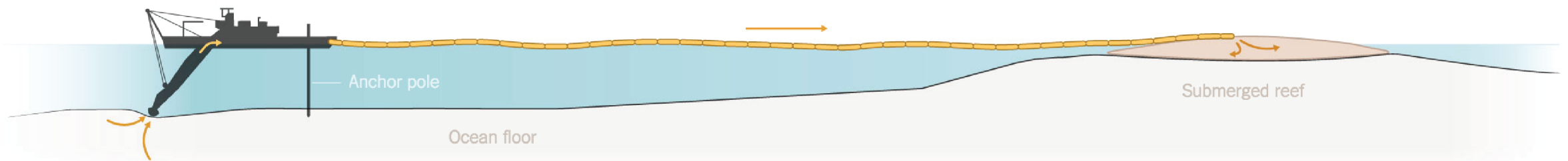
AERIAL PHOTOGRAPH OF MISCHIEF REEF
(6 March 2015)

ONE (1) TRAILING SUCTION HOPPER DREDGER

FURNISHED TO: MOAO DFA

SATELLITE IMAGE
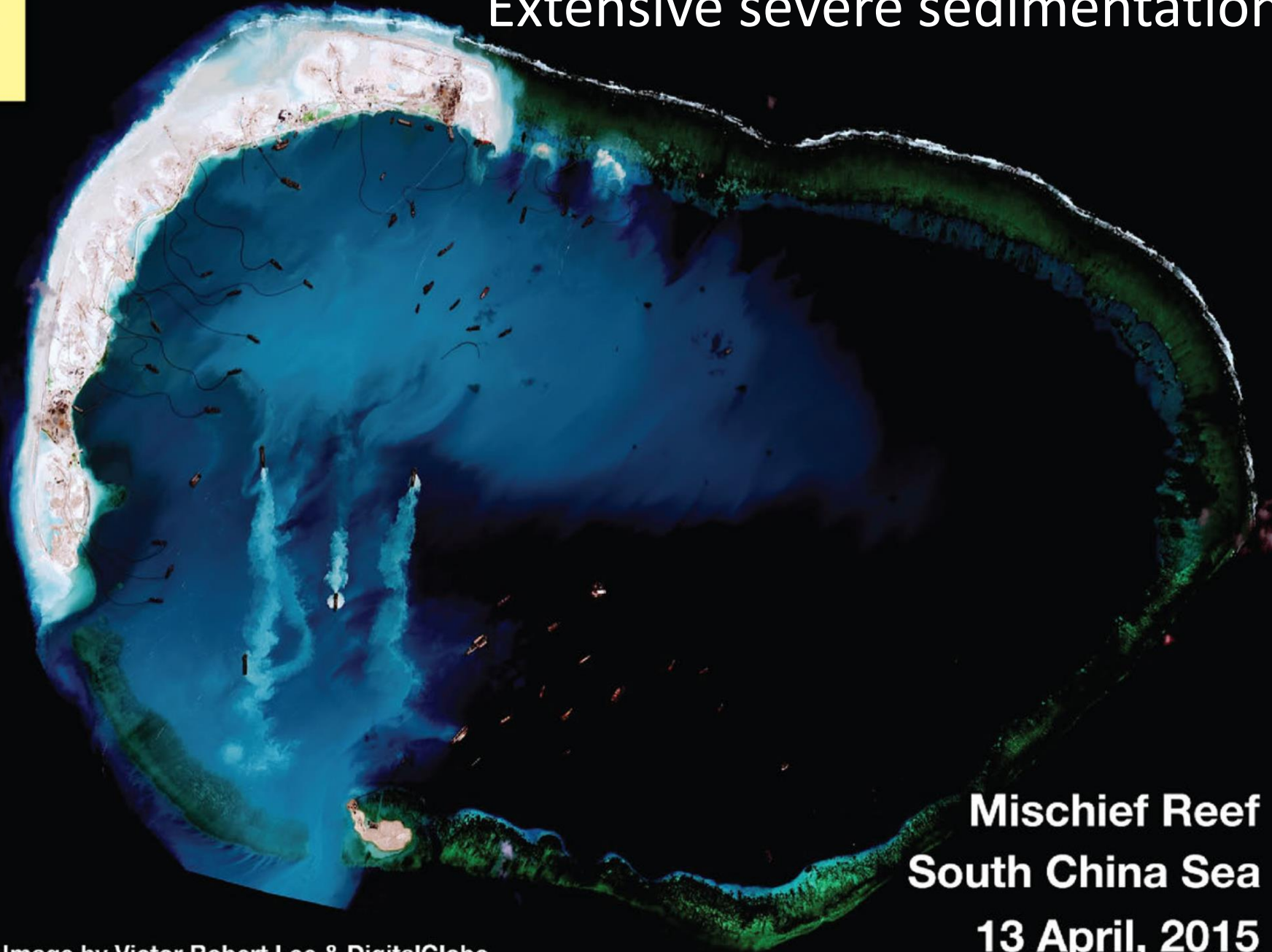OF MISCHIEF REEF
(16 March 2015)

Many dredgers used

Annex 792, Supplemental Written Submission of the Philippines

(Loewenstein 2) Figure 12

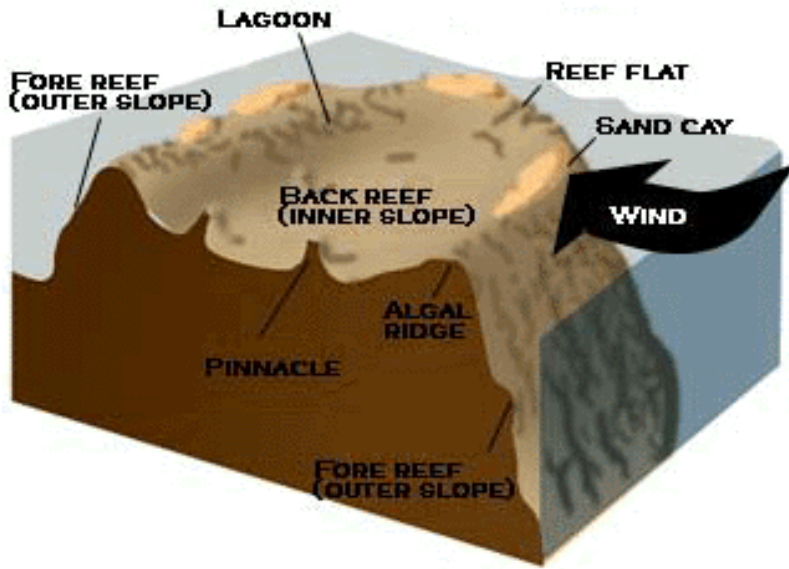# Mischief Reef, March 2015

SATELLITE IMAGE
OF MISCHIEF REEF
(13 April 2015)

Extensive severe sedimentation plume

Mischief Reef
South China Sea
13 April, 2015

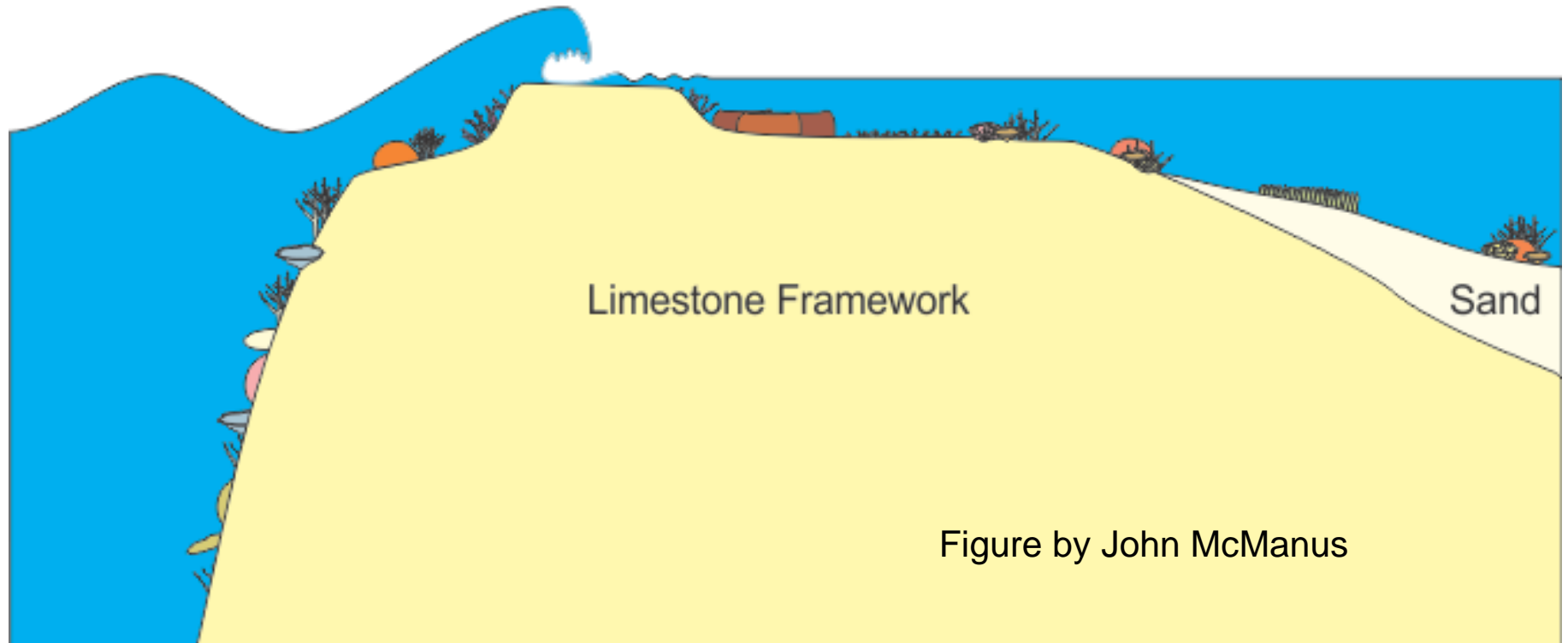Image by Victor Robert Lee & DigitalGlobe

Lagoonal Reef Communities

Figure by John McManus
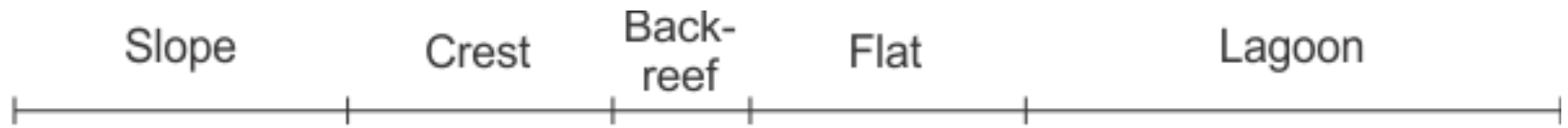
8.5 km

(Carpenter 2) Figure 5

SATELLITE IMAGE
OF MISCHIEF REEF
(19 October 2015)

Dredging complete, sediment plume continues

Annex 792, Supplemental Written Submission of the Philippines

(Carpenter 2) Figure 6
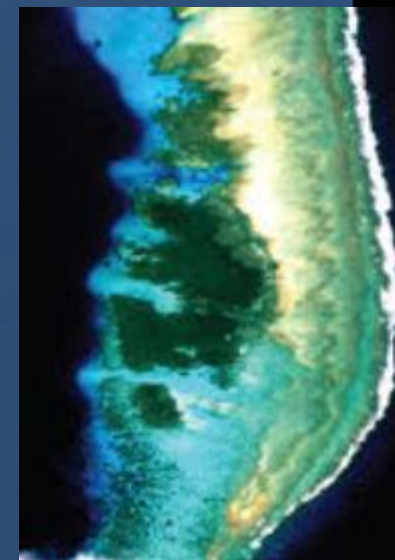
January 2012

SATELLITE IMAGE
OF MISCHIEF REEF
(19 October 2015)

January 2012

Despite shoreline hardening

(Carpenter 2) Figure 8

SATELLITE IMAGE OF
SEDIMENT PLUME AT MISCHIEF REEF
(19 October 2015)

325 m

CONCEPTUAL RELATIONSHIP BETWEEN THE INTENSITY AND DURATION OF A STRESS EVENT
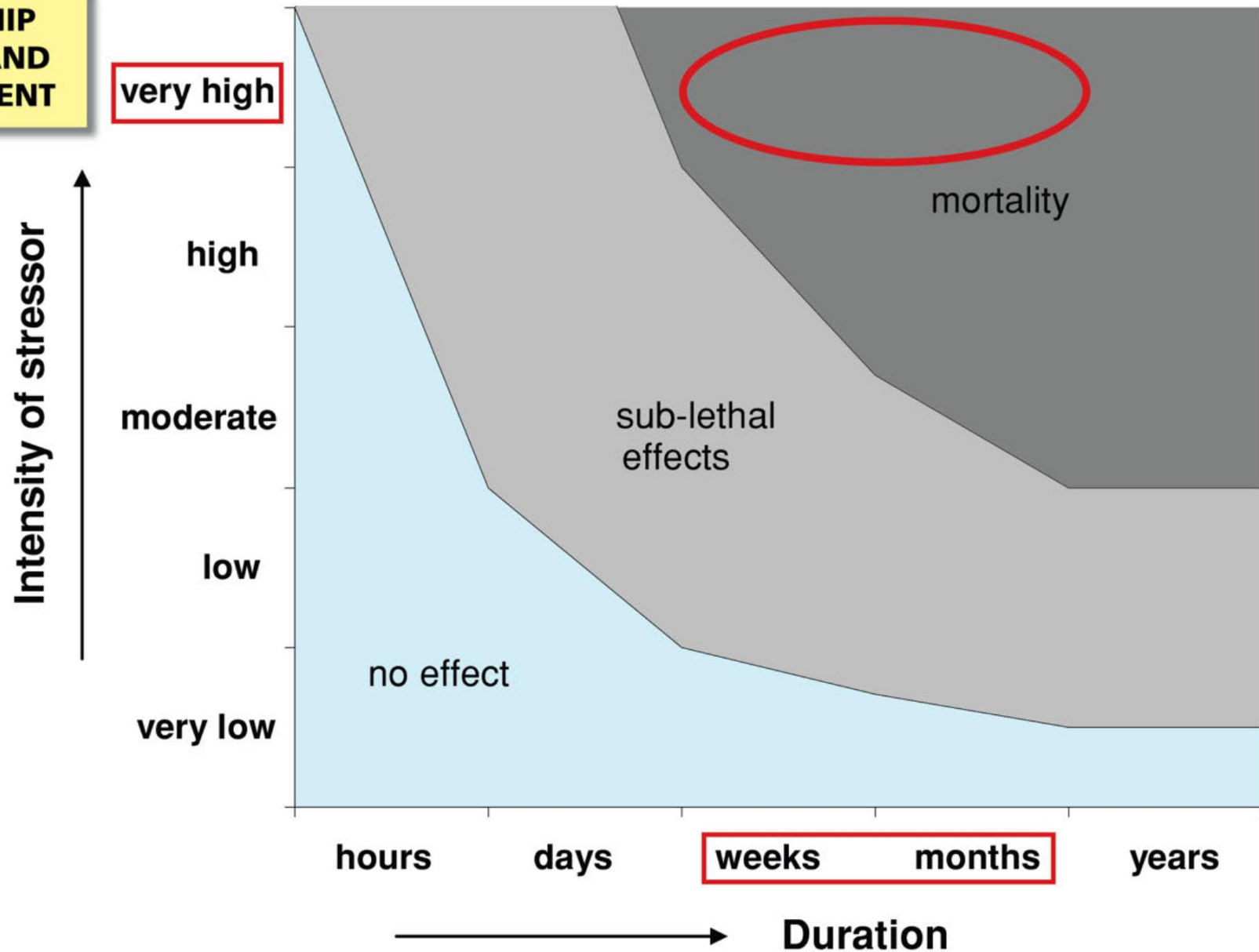
Intensity of stressor: very high, high, moderate, low, very low

mortality

sub-lethal effects

no effect

Duration: hours, days, weeks, months, years

(Carpenter 2) Figure 9

Major construction on 6 other reefs

Subi Reef

Fiery Cross Reef

3250 m runway

4. Were coral reefs protected?

NO!

4. Were coral reefs damaged?

YES!

5. Was damage done beyond immediate vicinity?

- so conducted as not to cause damage by pollution to other States and their environment, and …. [5] does not spread beyond the areas where they exercise sovereign rights (UNCLOS Part XII, article 192)

  - Does destruction of coral reefs in one area, impact the viability of reefs in another area?

Two Stage Life History of Marine Species

Adults – free swimming or fixed

Larvae – spawn in water column and mostly at mercy of currents
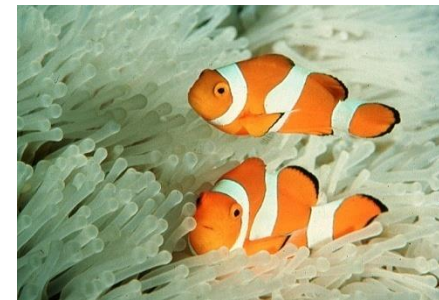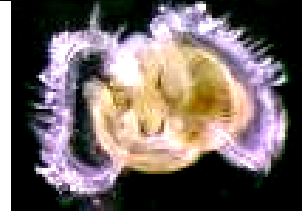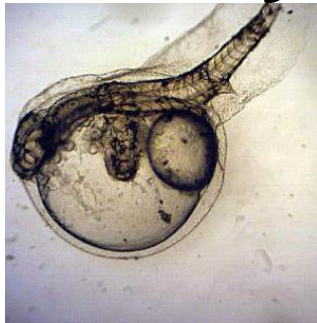
Would damage harm other states?

- Larval modelling evidence

- 'Heat map' of connectivity

- Likelihood that reefs are dependent on each other for larval replenishment.

Eric A. Treml, et. al., "The emergent geography of bio"physical dispersal barriers across the Indo-WestPacific," in *Diversity and Distributions*, (2015) 1–12.

MULTITAXON DISPERSAL BARRIERS AND FLOW CORRIDORS

Potential Barriers
% Taxa filtered
- - - - - < 5%
- - - - 5 to 10%
———— 10 to 30%
———— 30 to 50%
▬▬▬ > 50%
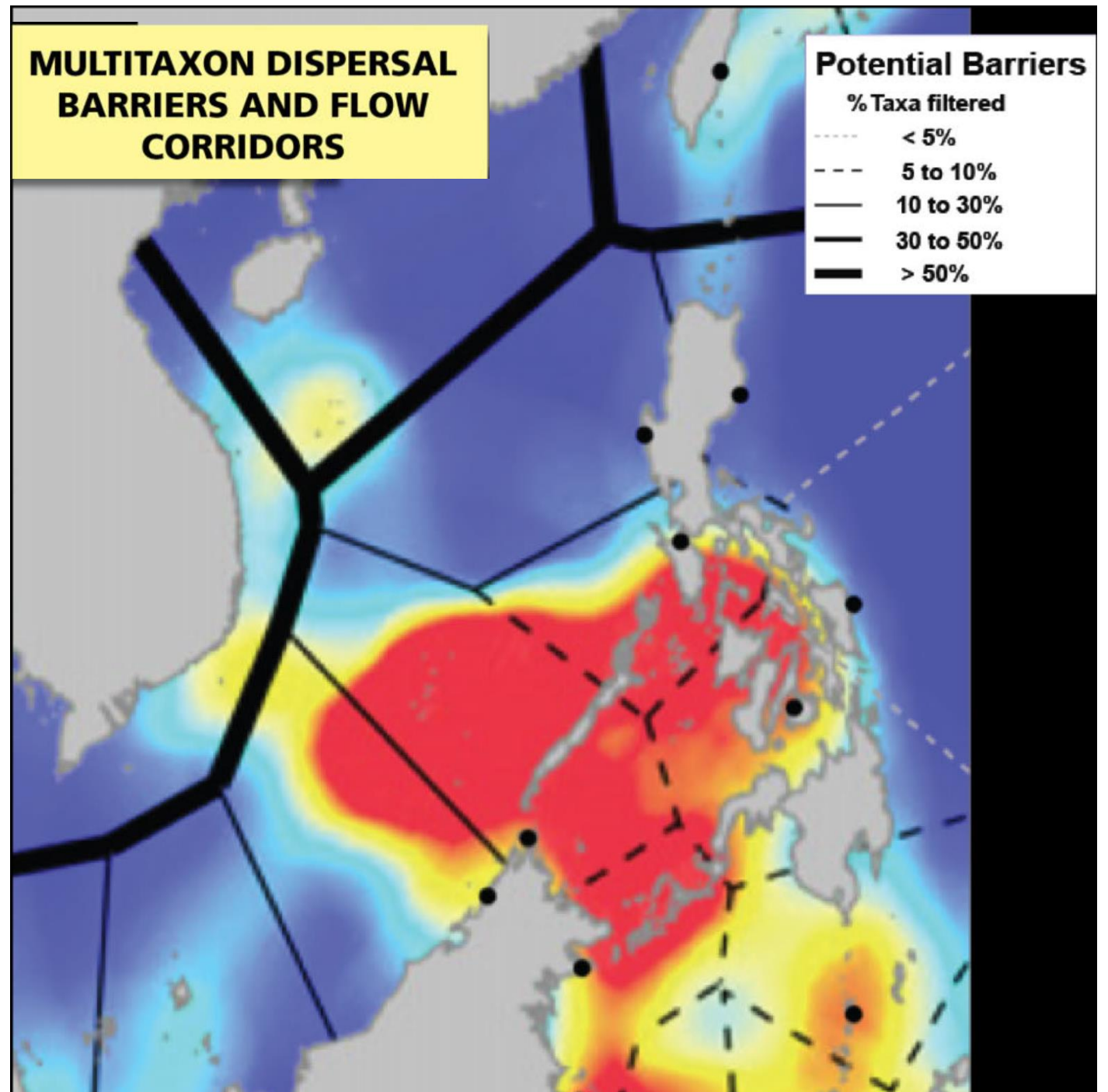
Would damage harm other states?

- Further Larval modelling evidence

RELATIVE FREQUENCY OF CONNECTIVITY BETWEEN THE SPRATLY ISLANDS AND REEFS OF THE SOUTH CHINA SEA

Dorman, et al 2015

Coral Reefs
DOI 10.1007/s00338-015-1354-3

REPORT

Modeled connectivity of *Acropora millepora* populations from reefs of the Spratly Islands and the greater South China Sea

Jeffrey G. Dorman[1] · Frederic S. Castruccio[2] · Enrique N. Curchitser[3,4] · Joan A. Kleypas[2] · Thomas M. Powell[1]
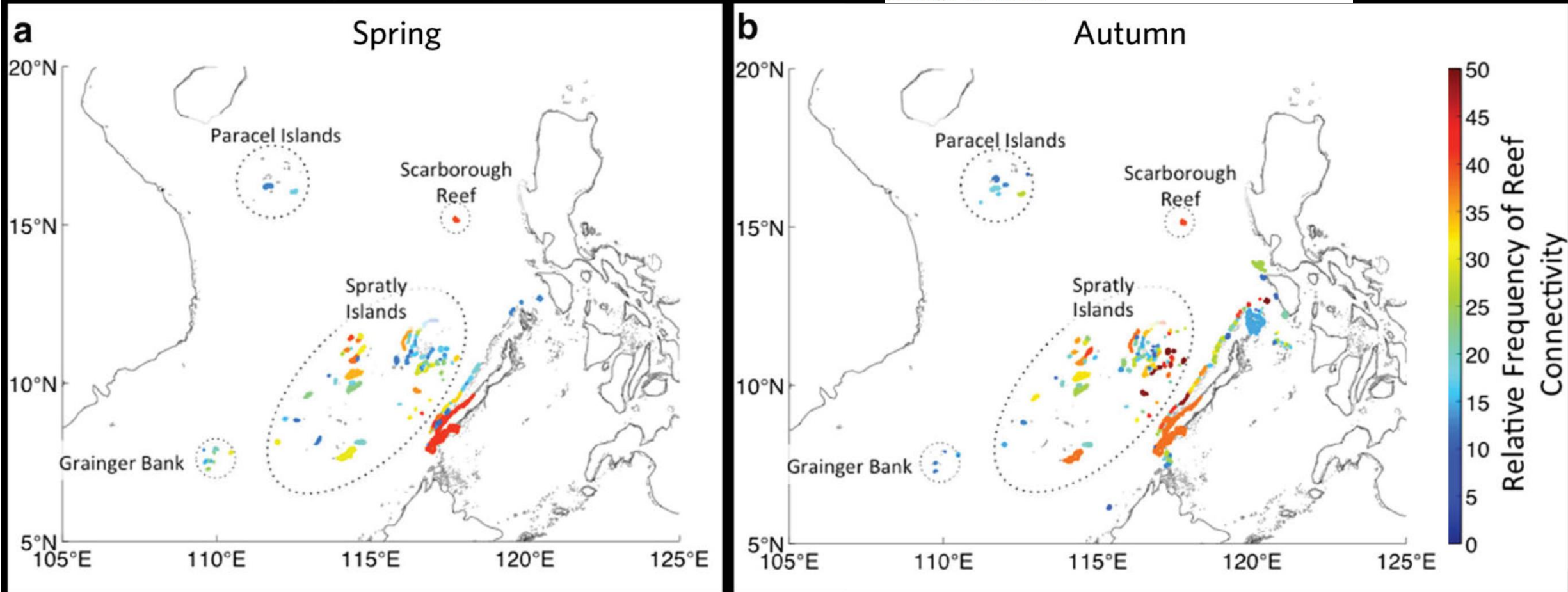
5. Was damage done beyond immediate vicinity?

- so conducted as not to cause damage by pollution to other States and their environment, and …. [5] does not spread beyond the areas where they exercise sovereign rights (UNCLOS Part XII, article 192)

  - Does destruction of coral reefs in one area, impact the viability of reefs in another area?

MAYBE

Clam extraction evidence after hearing

PRC claims that islands built on already destroyed reefs……….

- A lot of media attention, expose's and subsequent spotlight on 'cutter boat' clam extraction activity.

- Media is a conservation biology instrument….

Giant Clam Cutter/Chopper Boats: Paracel and Spratly Islands

Courtesy of John McManus

a

b

c

d

a.,b. http://blog.sina.com.cn/s/blog_51460dc40102e5eq.html
c. Google Earth/Digital Globe
d. J. McManus

Giant Clam Shell and Carvings – new 'white gold'

Fiery Cross Reef: Near-Natural to Clammed to Island

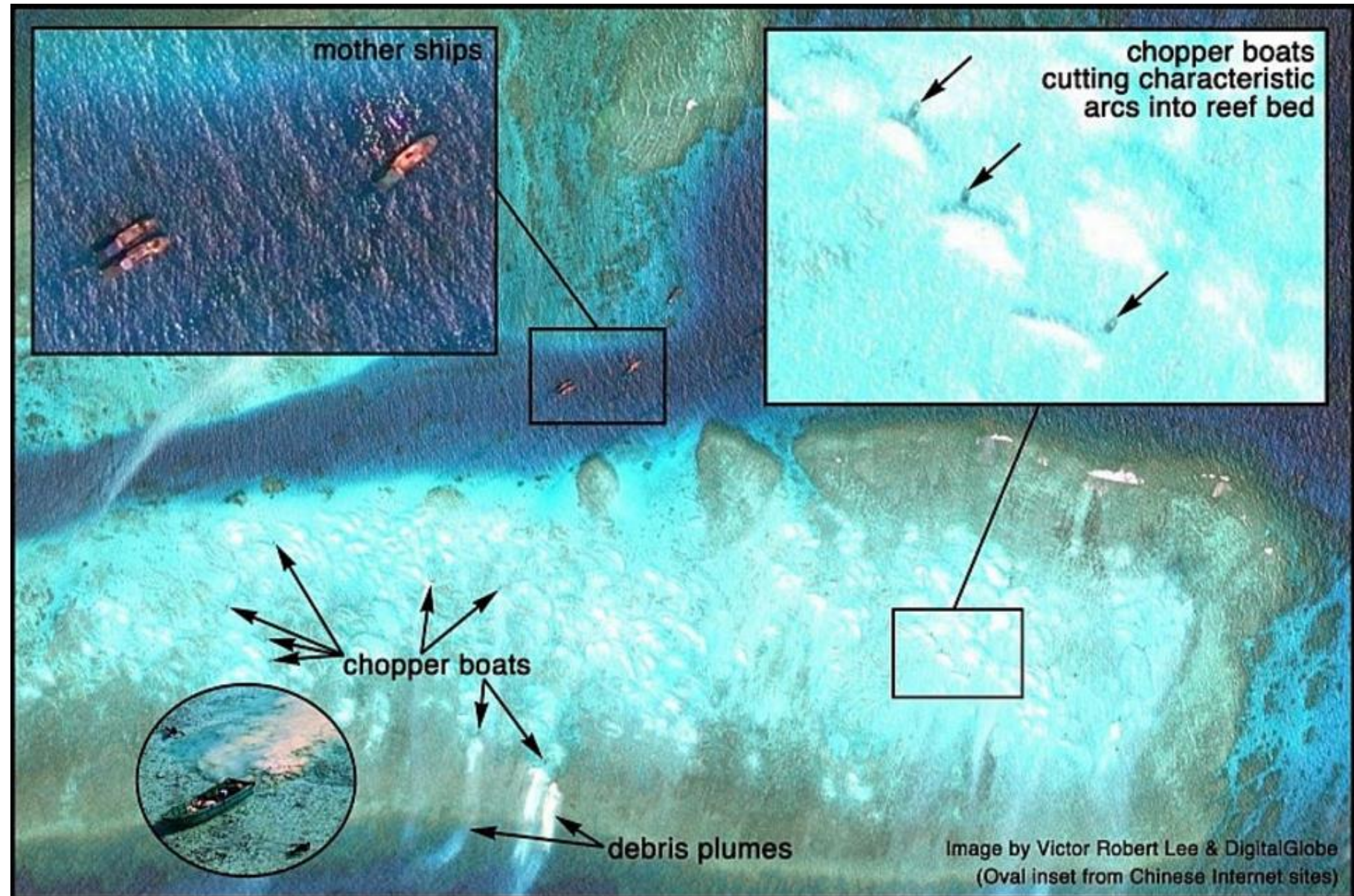September 3, 2015

AIRSTRIP

NEW CONSTRUCTION

Courtesy of John McManus

a. CSIS Asia Maritime Transparency Initiative / Digitalglobe
b. and c. Google Earth/Digital Globe 2016

Source: Southerland, 2016. U.S.-China Economic and
Security Review Commission

Chopper boats mistaken for dredging activity

Victor Robert Lee,
"The Diplomat"
January 15, 2016

mother ships

chopper boats cutting characteristic arcs into reef bed

chopper boats

debris plumes

Image by Victor Robert Lee & DigitalGlobe
(Oval inset from Chinese Internet sites)

Reef chopping underway at East Thitu Reefs. 31 chopper boats and 6 mother ships are present in the original frame.
5 March, 2014

Fiery Cross Reef 5-31-2014

Subi Reef 1-26-2015

Mischief Reef 1-7-2015
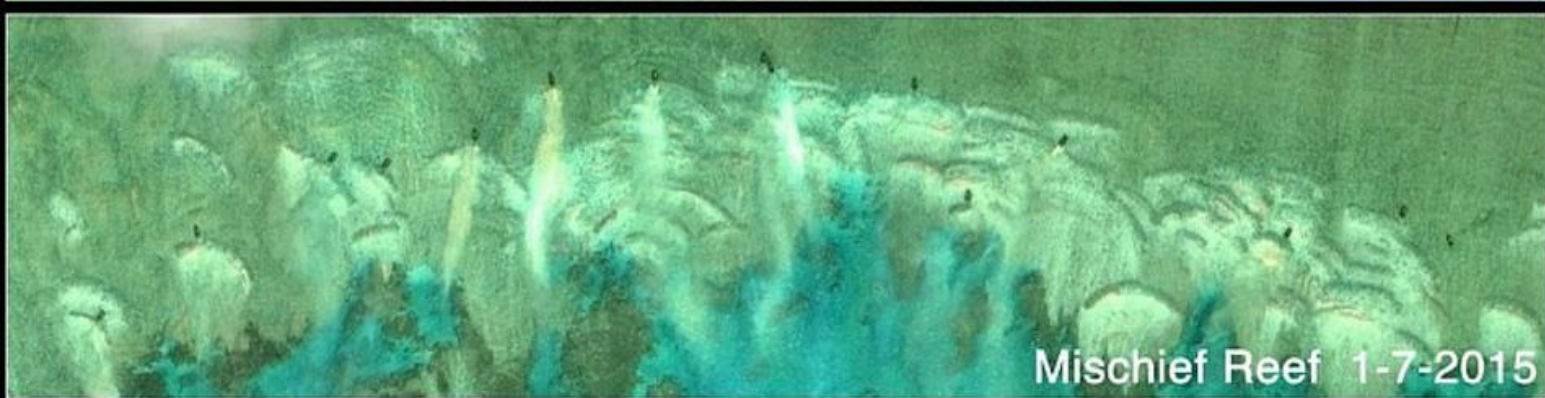
Close-up images show Fiery Cross, Subi and Mischief Reefs were all subjected to extensive prop chopping for giant clam shells in the months prior to land filling operations by China.

Image by Victor Robert Lee & DigitalGlobe

Victor Robert Lee, "The Diplomat" January 15, 2016

Screenshots from Chinese Internet sites showing reef chopping to find giant clam shells; hauling of shells on Tanmen fishing boats; and piles of giant clam shells to be sold.

China's President Xi Jinping visits Tanmen fishermen and members of a maritime militia composed of Tanmen fishermen on Hainan Island in April, 2013. Screenshots from CCTV and Xinhua.

Tanmen Fishermen

NOTE: screen shots from Chinese bloggers

Victor Robert Lee, "The Diplomat" January 15, 2016

Evidence entered into PCA testimony....
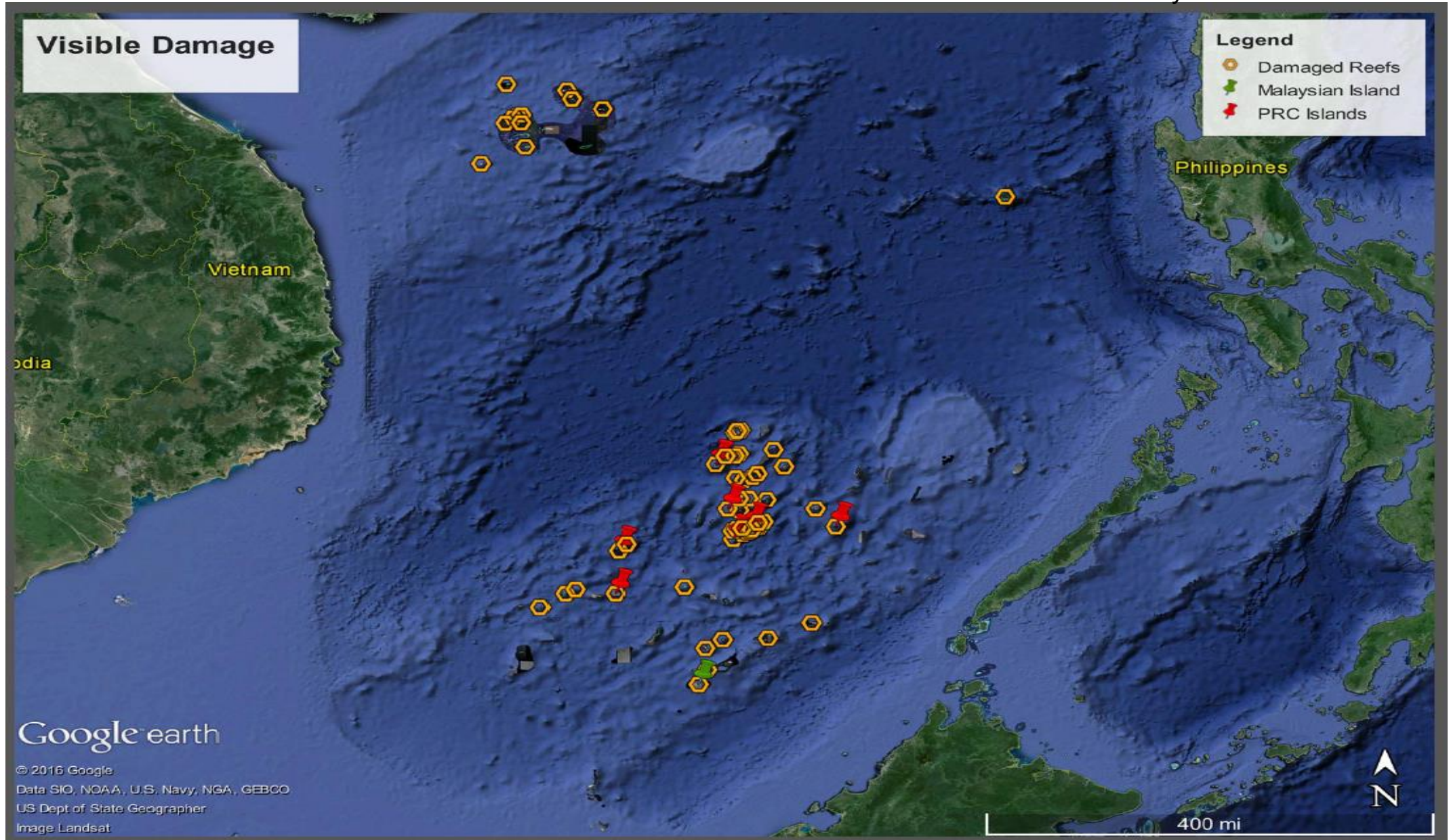
Minimal Estimates of Damage to the Offshore Reefs

Type of Damage	Number of Reefs		Area Damaged (km²)	
	PR China	Total	PR China	Total
Island Building and Reinforcement	16	31	**14**	**15**
Materials Dredging	3	7	**39**	**40**
Channel/Harbor Dredging	13	27	**2**	**3**
Giant Clam Chopper Boat Damage	41	41	**104**	**104**
Total	---	---	**159**	**162**

Courtesy of John McManus

Notes:

1. Areas where island building covered cutter boat damage omit the latter.

2. Some reefs have multiple sources of damage and so 'Number of Reefs' is not additive.

3. Many offshore reefs are heavily overfished, but this is currently difficult to quantify.

4. 1 km² is 1,000,000 m².

SUMMARY:
Evaluation of PCA Decision July 2016

PCA Case Nº 2013-19

IN THE MATTER OF THE SOUTH CHINA SEA ARBITRATION

- before -

AN ARBITRAL TRIBUNAL CONSTITUTED UNDER ANNEX VII TO THE
1982 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

- between -

THE REPUBLIC OF THE PHILIPPINES

- and -

THE PEOPLE'S REPUBLIC OF CHINA

- **479 page report (on the web)**
- **79 pages on environmental dispute**
- **Territorial dispute – UNCLOS rules**
- **Environmental component:**
1) **Had not followed national policies**
2) **Threatened species not protected**
3) **Coral reefs fragile ecosystems**
4) **Coral reefs NOT protected**
5) **Connectivity mentioned but….**

Thank you

All that I presented is public record; transcripts of arguments on:

http://www.pcacases.com/web/view/7