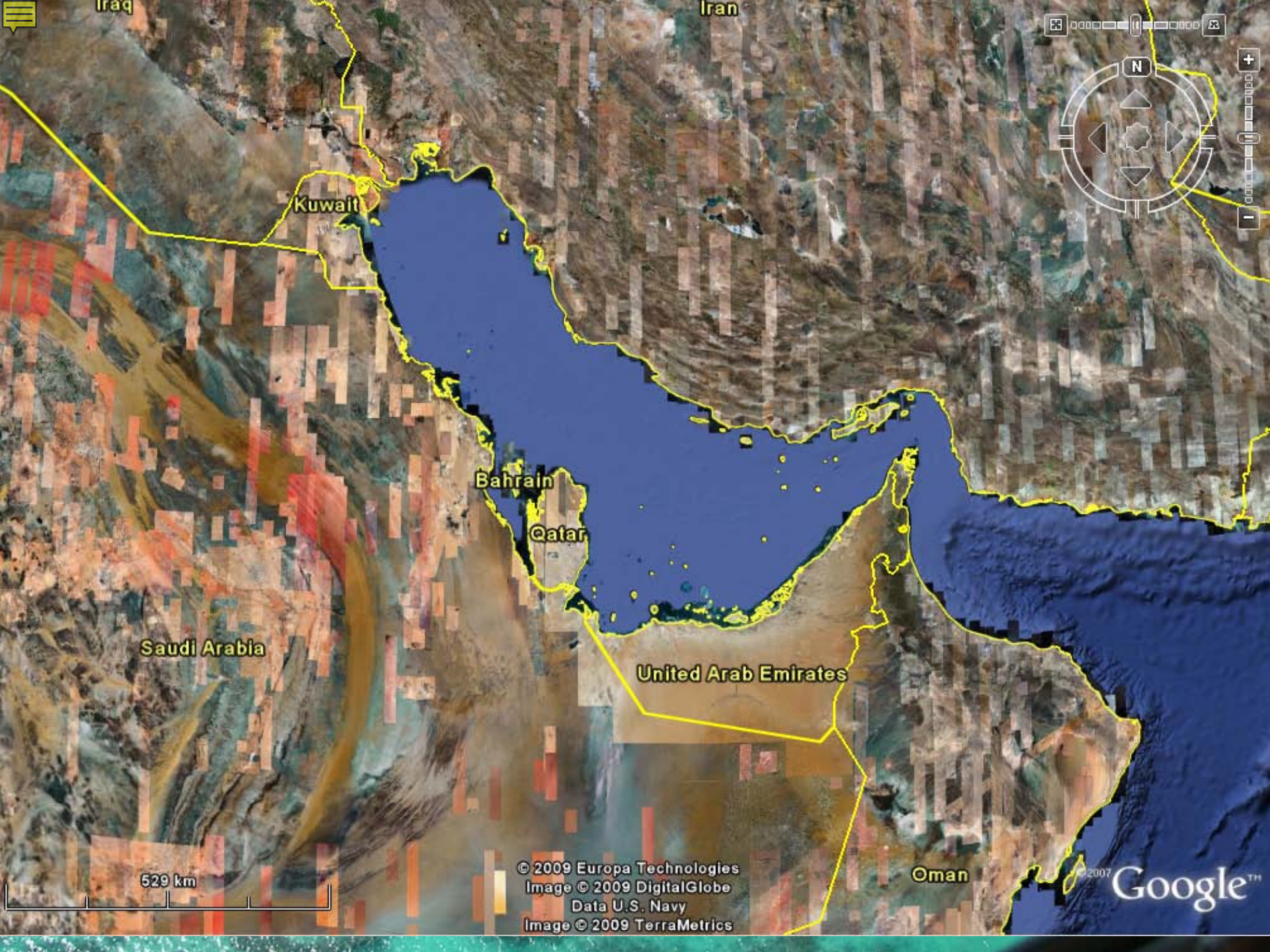
Why the Gulf needs Protected Areas?

Hanneke Van Lavieren

New York 16 Nov 2011


Iraq
Iran
Kuwait
Bahrain
Qatar
Saudi Arabia
United Arab Emirates
Oman
529 km
© 2009 Europa Technologies
Image © 2009 DigitalGlobe
Data U.S. Navy
Image © 2009 TerraMetrics
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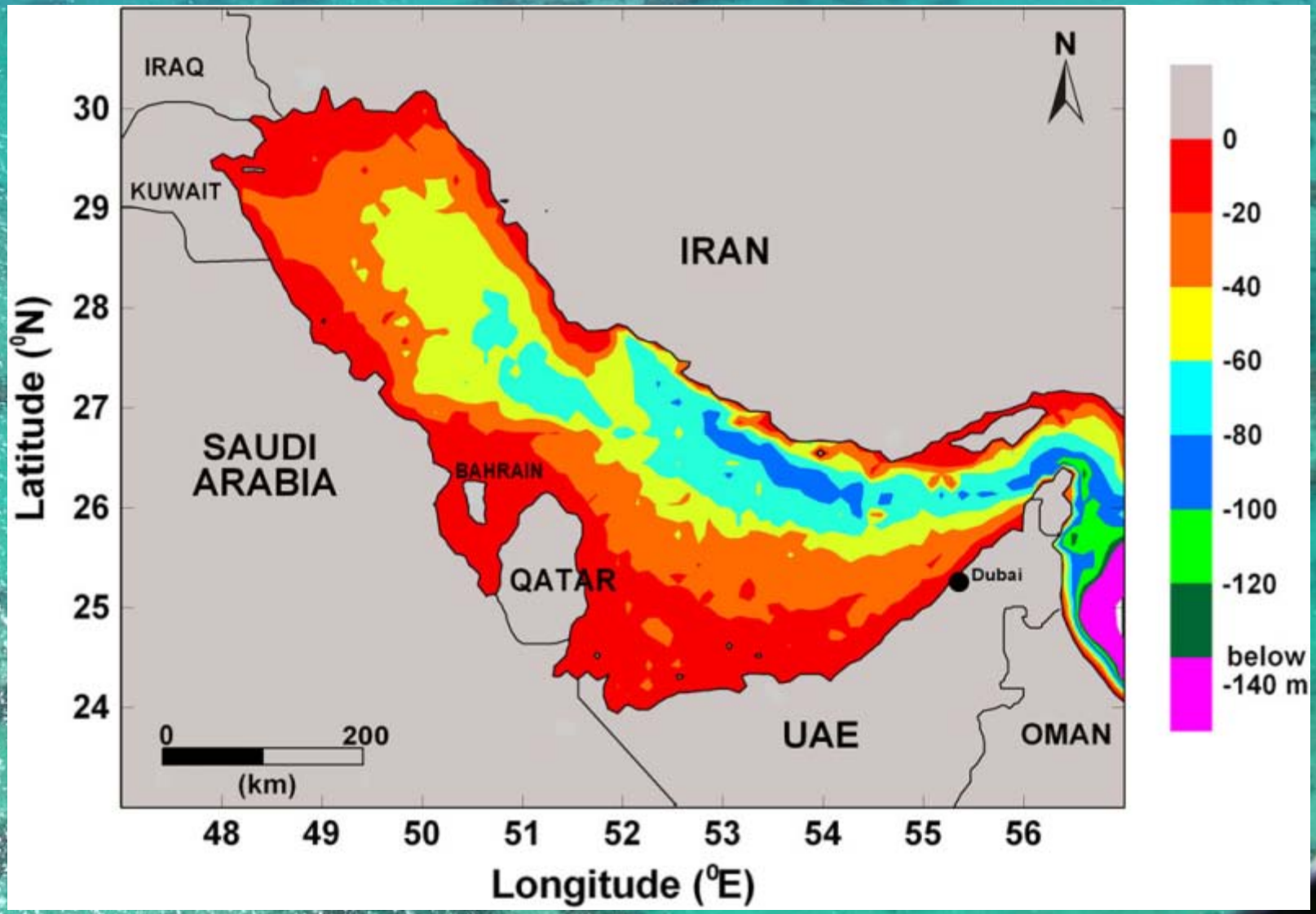
Semi-enclosed & shallow basin

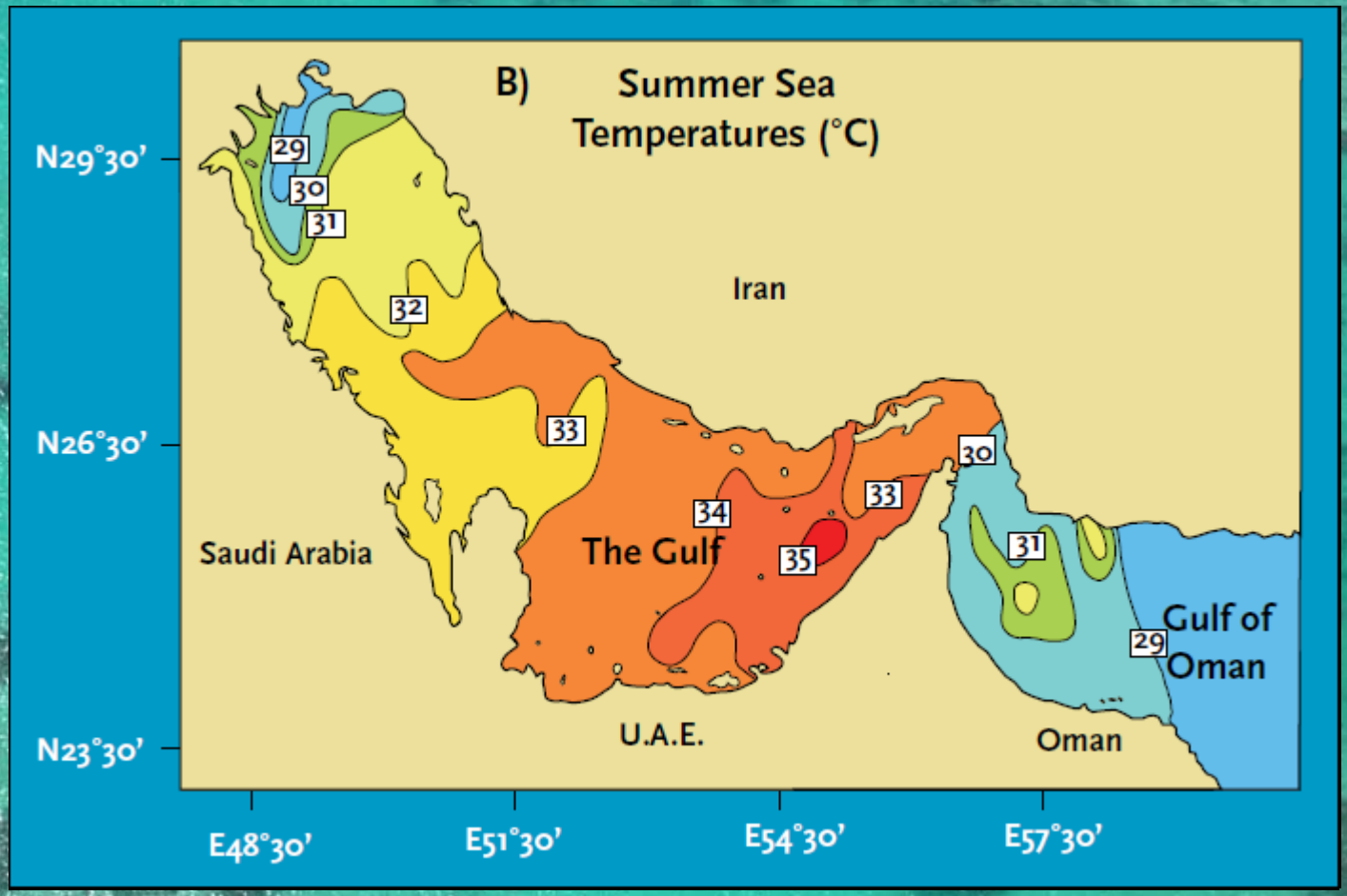


Arid Climate

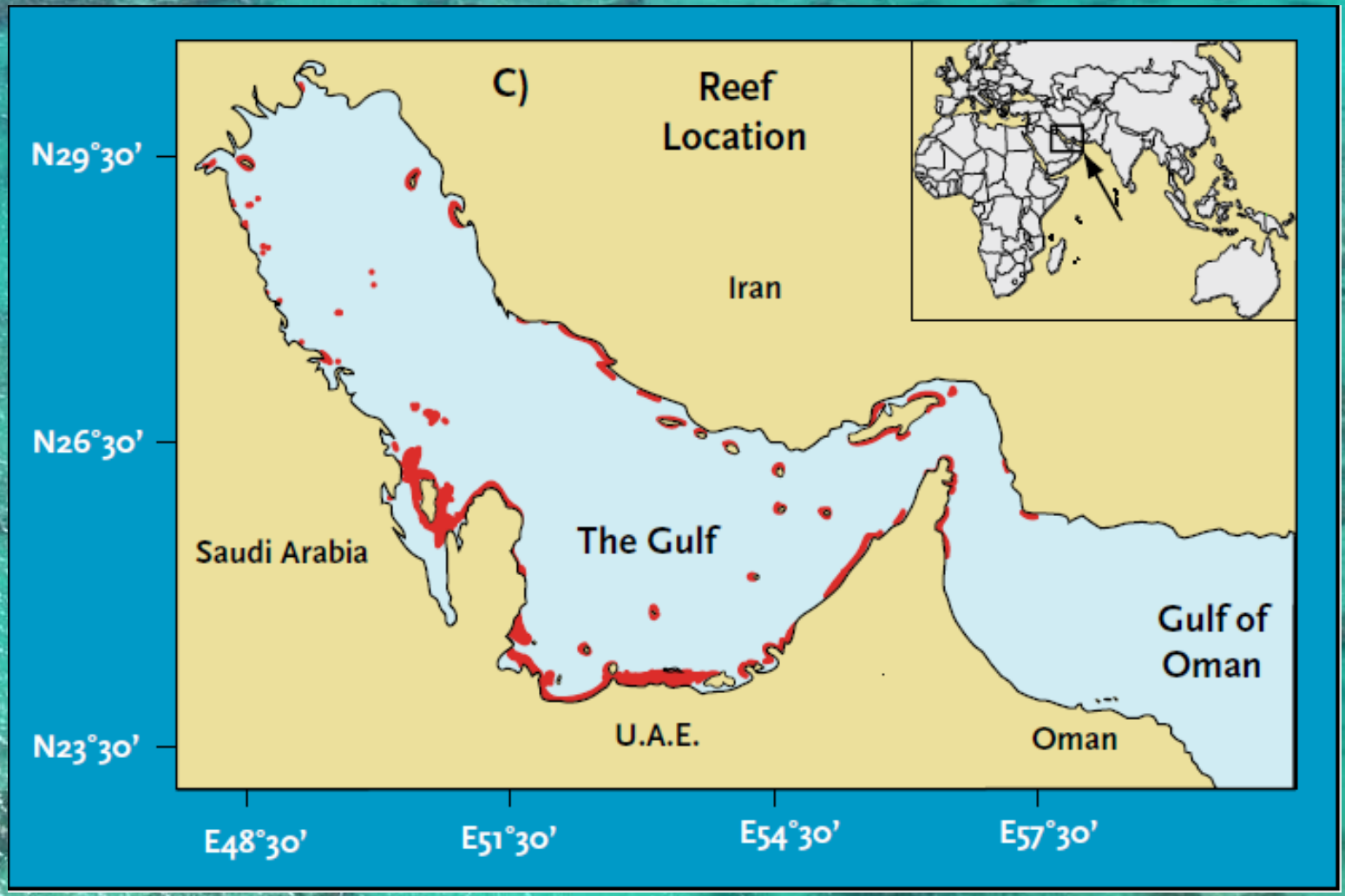
Evaporation > input precipitation & river runoff

Extreme salinity exceeding 43 psu (typically 37 psu)

Extreme Physical Conditions




UNIQUE?
Adapted to extreme environmental conditions & surviving at temperatures higher than elsewhere in the world
A unique coastal environment


C)
Reef
Location
Iran
Saudi Arabia
The Gulf
Gulf of
Oman
U.A.E.
Oman
N29°30'
N26°30'
N23°30'
E48°30'
E51°30'
E54°30'
E57°30'

Ecological importance coastal wetlands & sea grass

Important habitat & nurseries for valuable (fishery) species

Low Species Diversity

Species	Gulf	Gulf of Oman	Red Sea
Fish	535	930	1,225
Coral	68	73	220
Mangrove	1	2	2
Seagrass	3	3	10

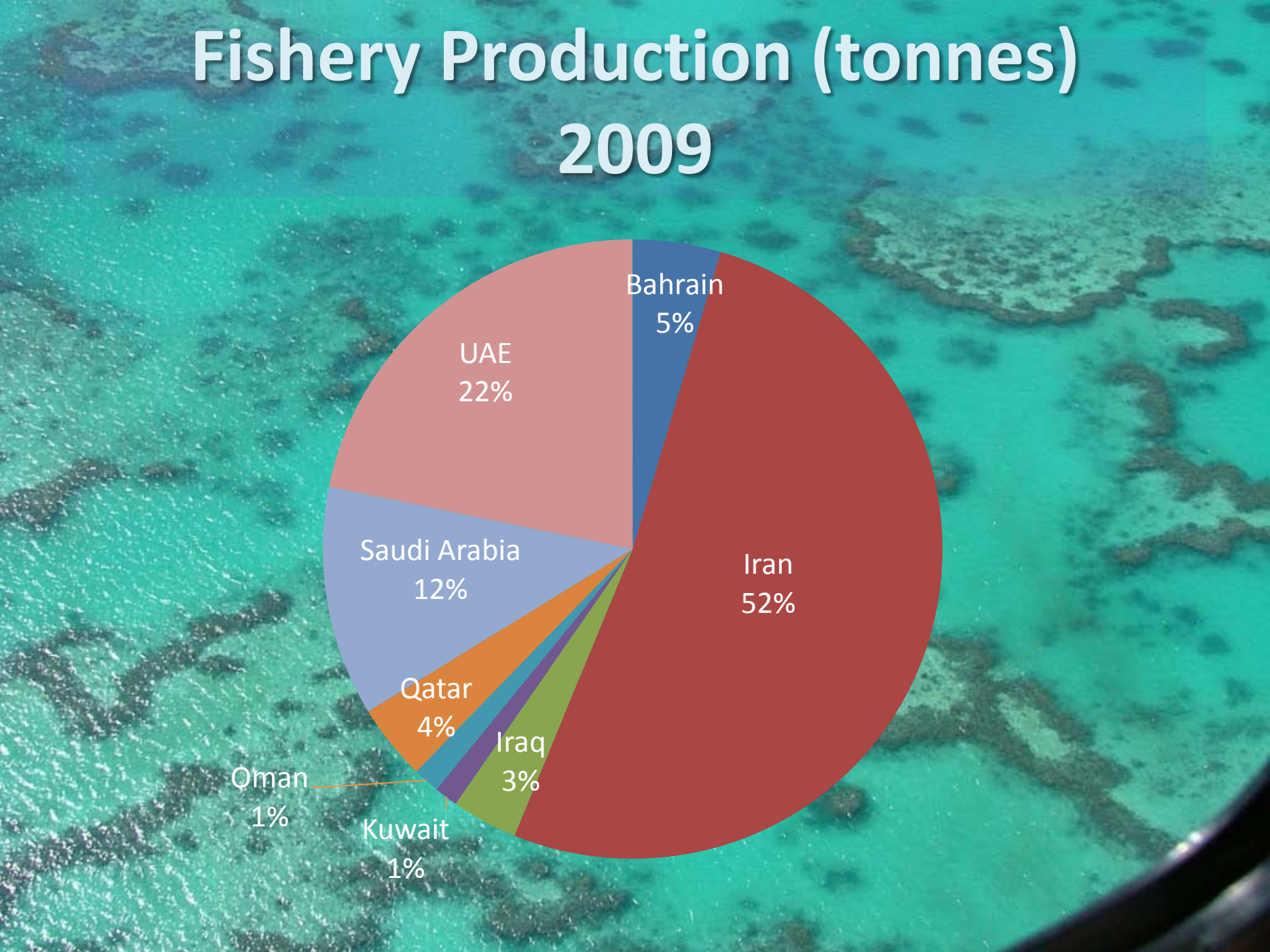
Fragile ecosystems

Indirect & direct economic values from coastal ecosystems

Important fishery resources

- Trade accounted for approx 1 M US$ in 2007
- Employs approx. 250,000 people directly
- Tourism is growing

Fishery Production (tonnes) 2009



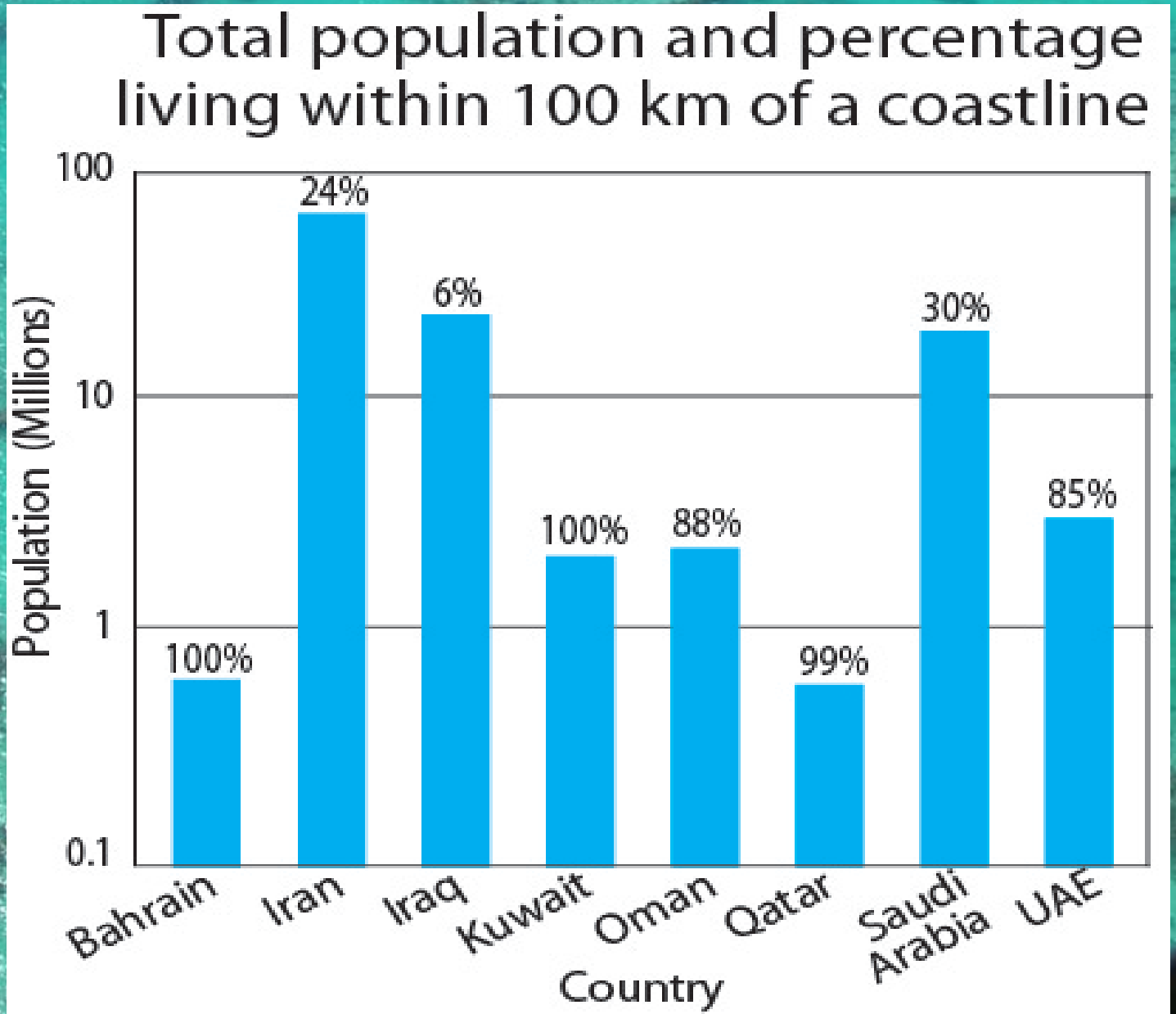
A center for oil
oil exploitation allowed unprecedented economic prosperity

Coastal Tourism

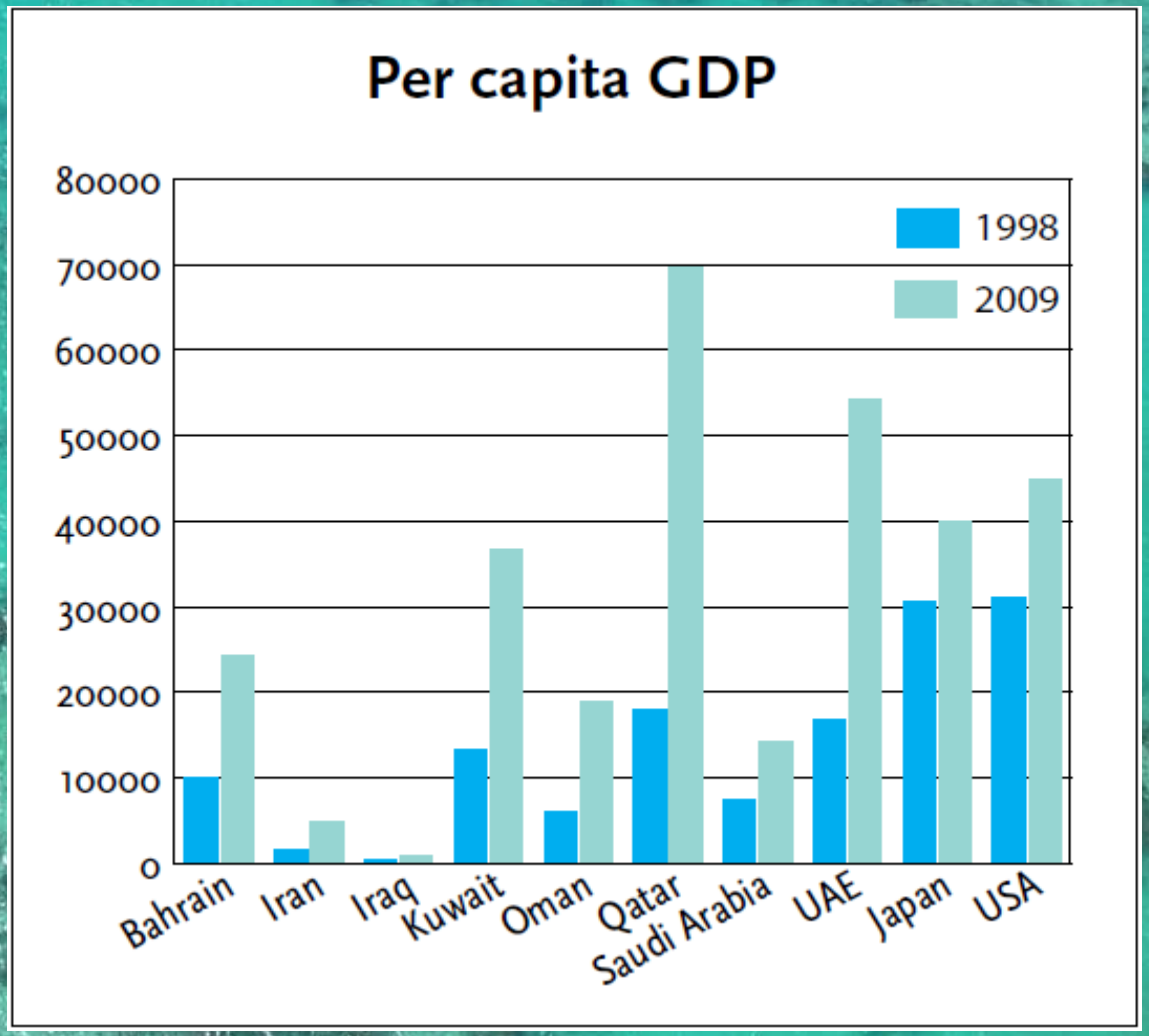
Depends for a large part on presence of healthy marine ecosystems & attractive coastal waters

Current Threats and Challenges

Populations predominantly near coastline

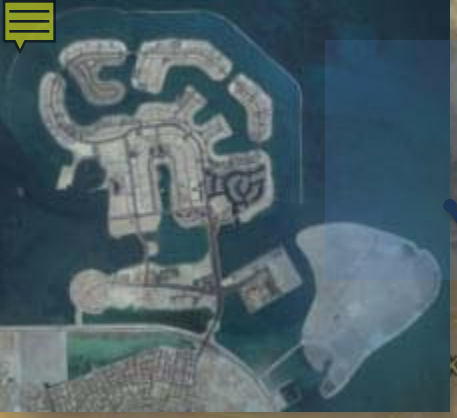


Unprecedented pace of growth & development



Annual growth (2.1%) nearly double world average (1.1%)

Coastal development for real estate accelerated



Impacts

Modification & loss of natural habitats

Modification coastal hydrodynamics

More people, more pollution Gulf being semi enclosed is a “pollutant trap”

Increased demand for Water

- Limited Freshwater resources
- Current rate of water use in GCC countries is about six times the natural renewal rate
- Qatar increase in water withdrawal by 300 % (between 1994 - 2009)
- UAE has third highest freshwater consumption rate in world

Desalinated Water

Desalination plants - Gulf contains
45 % of world capacity

Demand for Energy

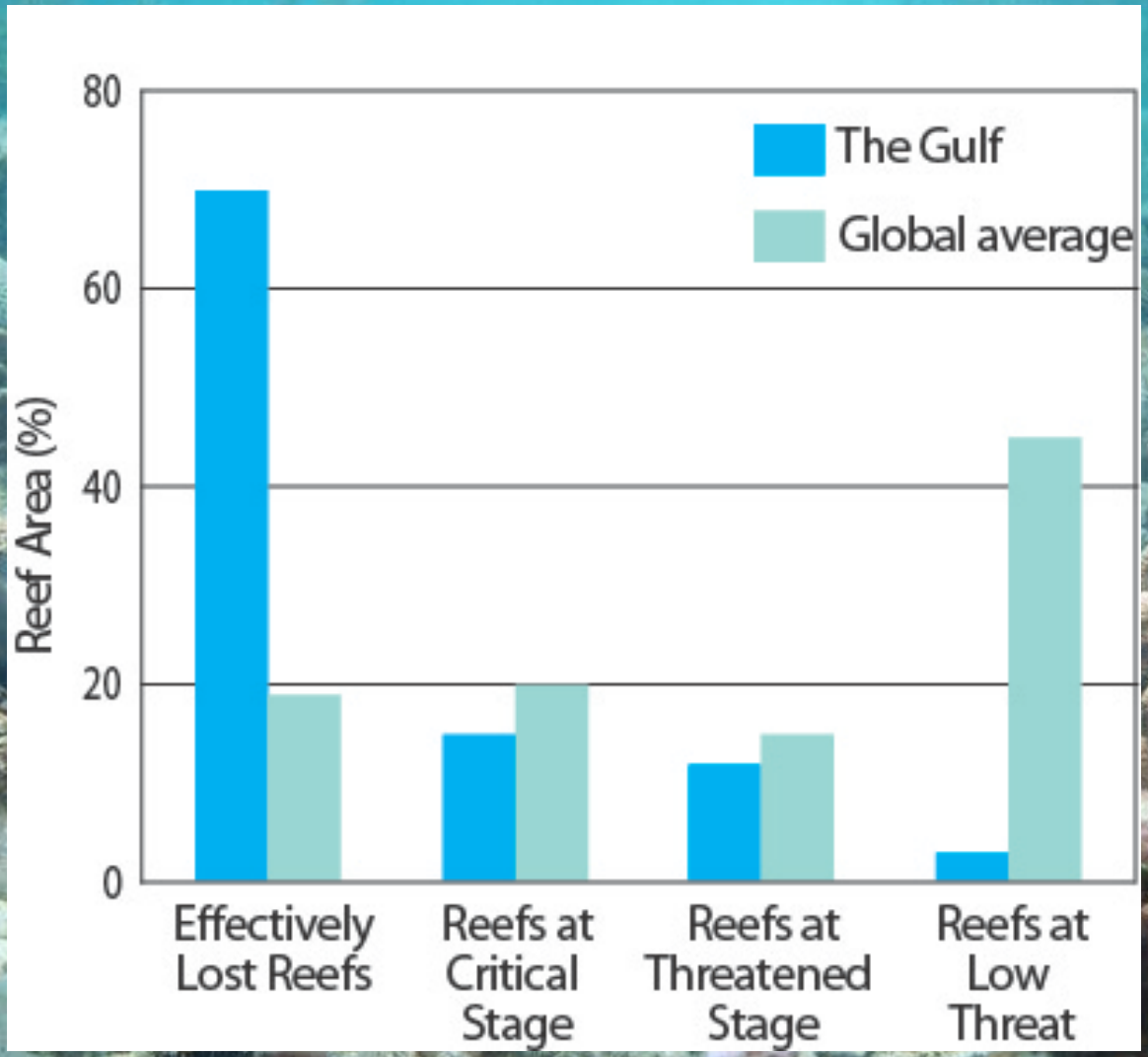
Demand for energy doubled over past 10 years

Country	Energy from Fossil Fuels (%)	Total Oil Production* ($x10^3$/bbl/day)	Share of World Production (%)	Total Oil Consumption ($x10^3$/bbl/day)	Per capita Consumption (bbl/day)	Per Capita Consumption as % More (+) or Less (-) than the World Average**
Bahrain	100	49	0.06	33	0.045	+45
Iran	98.8	4,325	5.29	1,730	0.026	-16
Iraq	99.7	2,423	2.96	295	0.01	-67
Kuwait	100	2,784	3.40	300	0.111	+258
Oman	100	728	0.89	69	0.02	+65
Qatar	100	1,378	1.68	104	0.125	+301
Saudi Arabia	100	10,846	13.26	2,224	0.078	+249
UAE	99.9	2,980	3.64	467	0.097	+213
Gulf Total	–	25,513	31.18	5,222	–	–

100 % from Fossil fuels

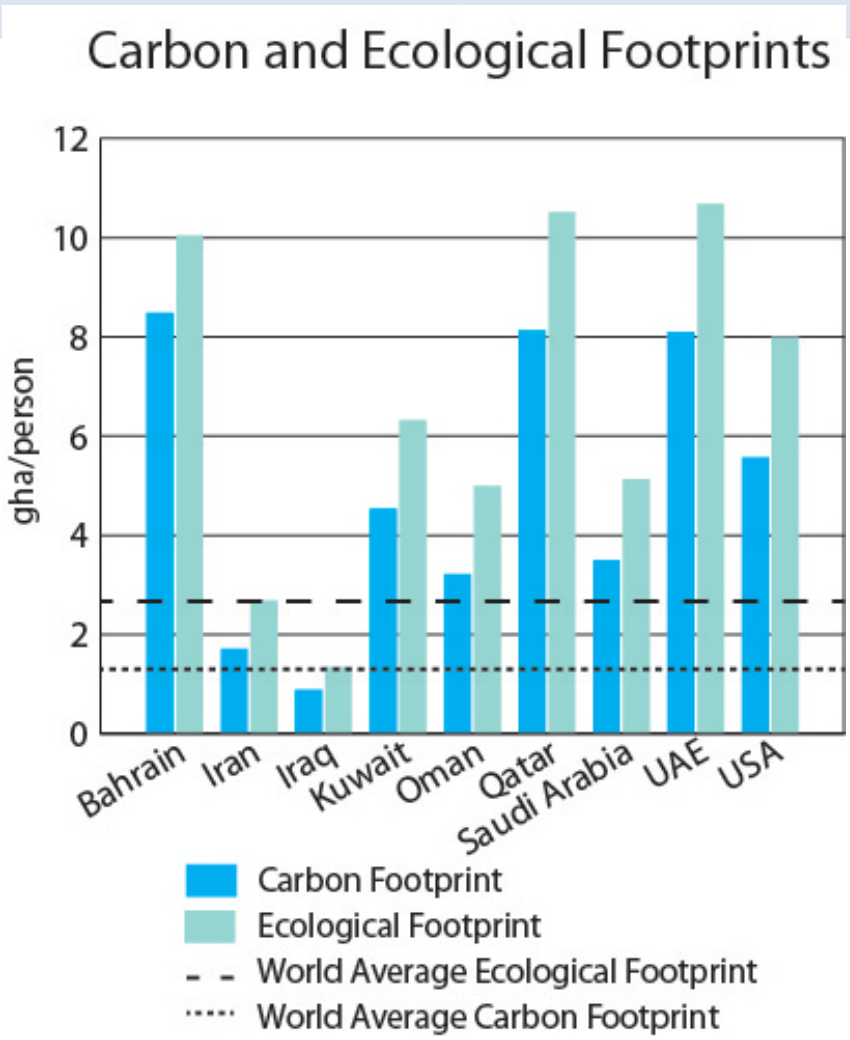
High per capita energy consumption

Condition of Reefs

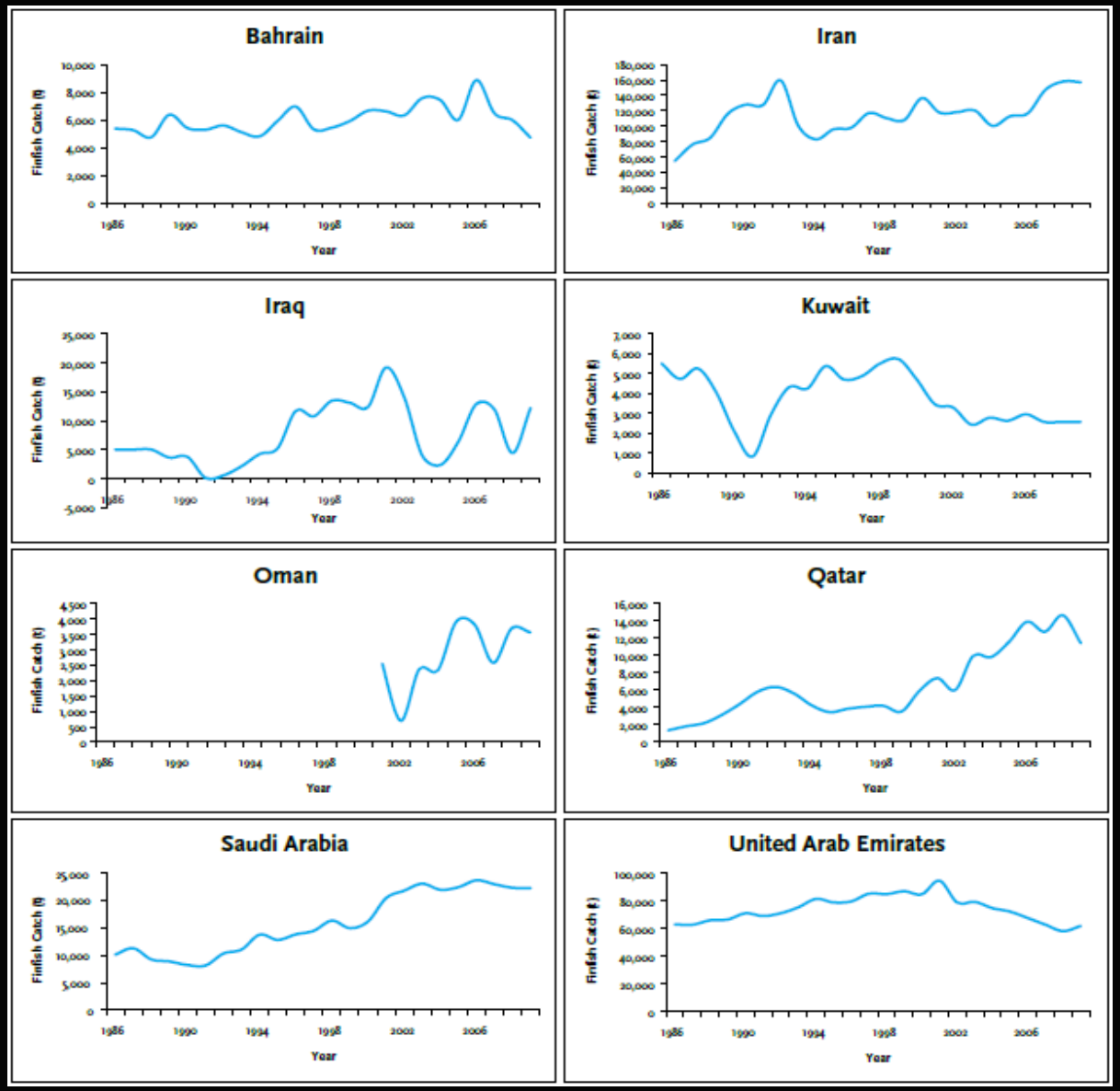


Only 3 % of reefs considered relatively undisturbed

Footprints


Carbon and Ecological Footprints
gha/person
12
10
8
6
4
2
0
Bahrain
Iran
Iraq
Kuwait
Oman
Qatar
Saudi Arabia
UAE
USA
Carbon Footprint
Ecological Footprint
World Average Ecological Footprint
World Average Carbon Footprint

Fish Overexploitation

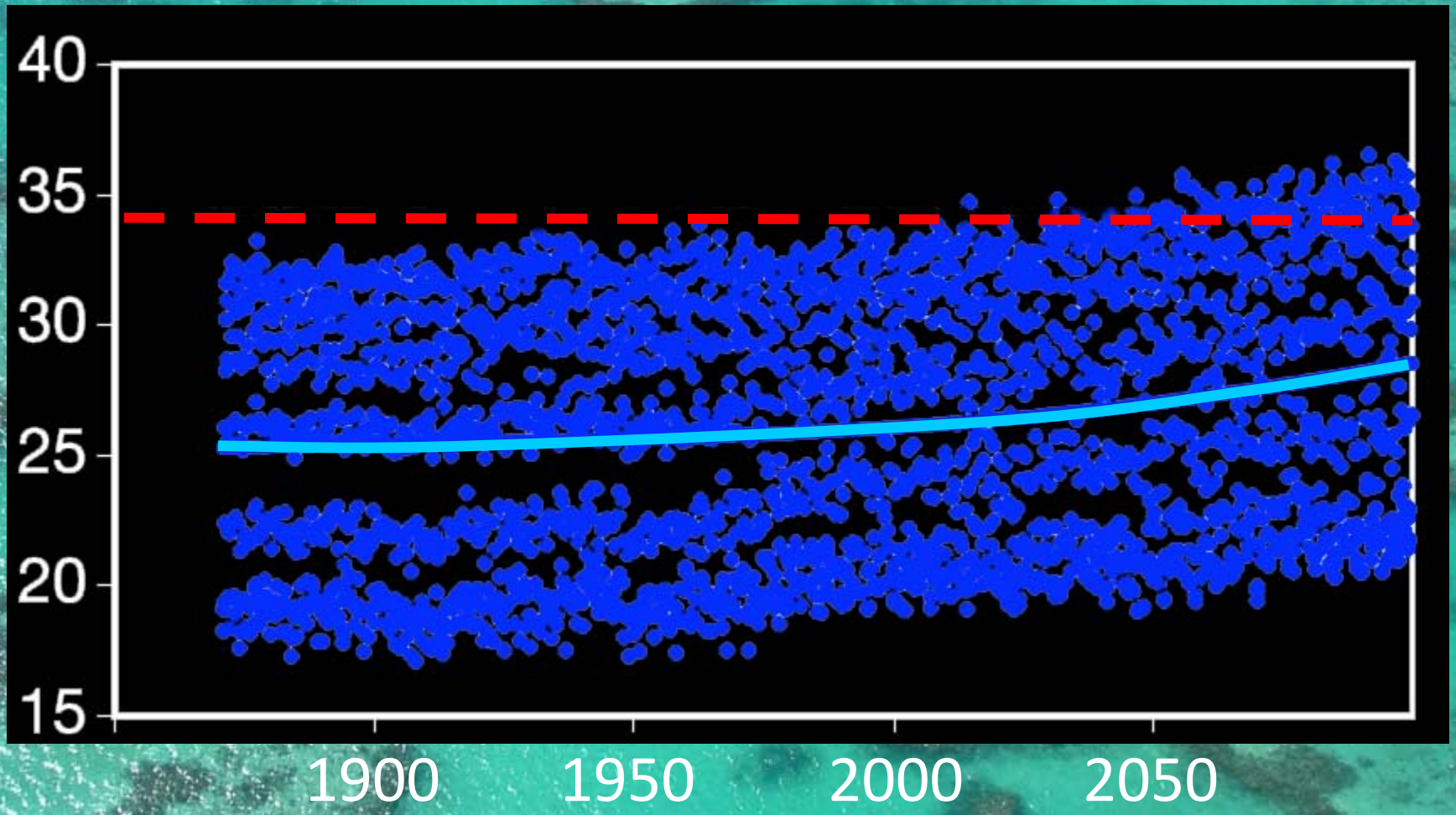


Since 2007 catches decreasing

Aquaculture risks

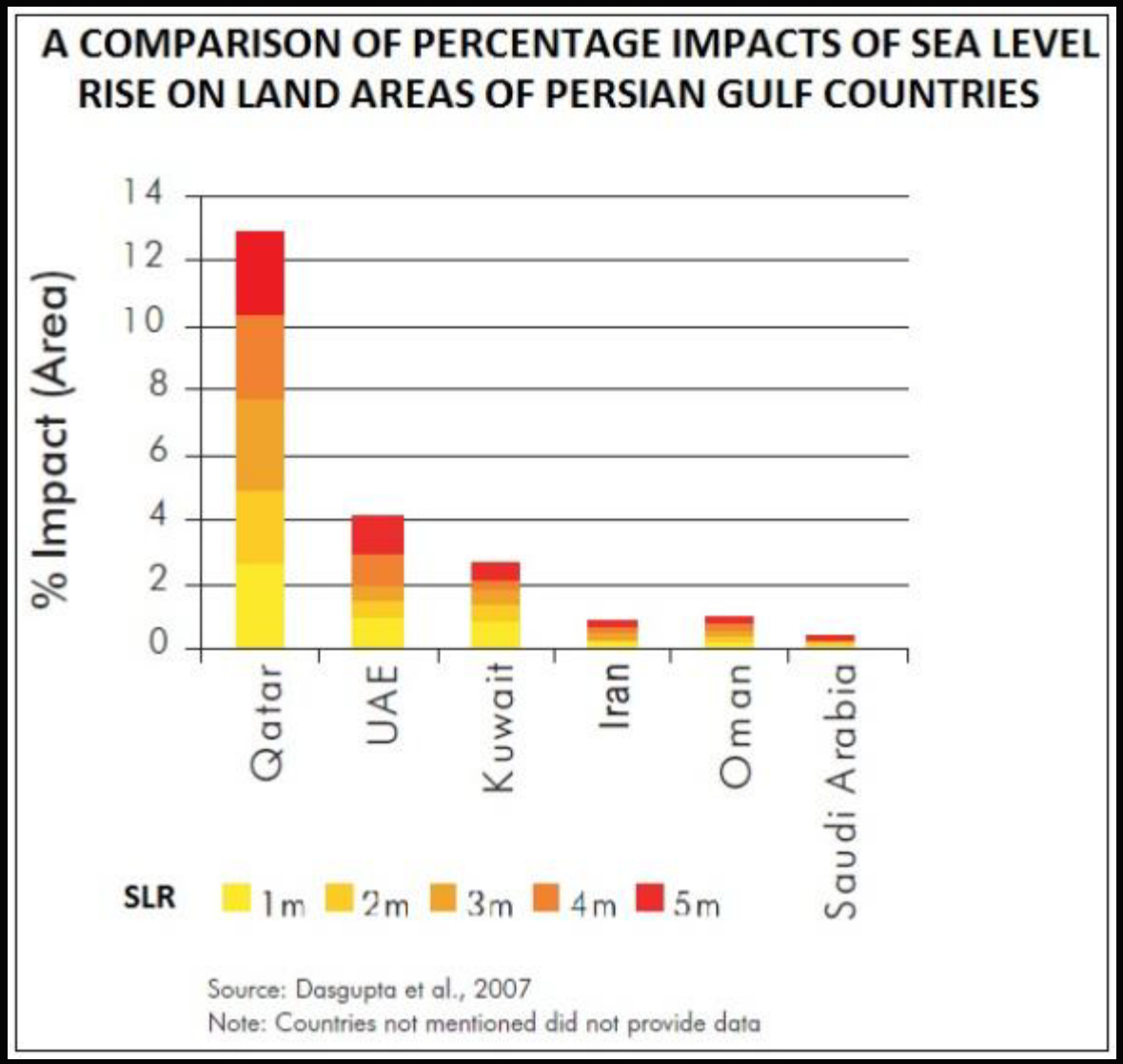
Aquatic invasions

Sea-surface Temperatures in the Gulf



Adapted from Sheppard (2003) *Nature*

Rising Sea levels



Improving Management of the Gulf Environment

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New York 16 Nov 2011

The Gulf Ecosystem is a Valuable Shared System

- Fishery yield ~ US$ 1 Billion per year*
- Fisheries/aquaculture ~ 250,000 people
- Growing coastal tourism revenues
- Major transport corridor
- Major oil and gas revenue
- Significant climate-ameliorating role

* Value includes catch in Gulf of Oman ~ 50% of total

Current Management of the Gulf is Deficient

Masked by the ultra-modern urban areas, a product of recent & very rapid development

- Little management capacity
- Lack of scientific tradition
- Limited regulatory capacity
- Little effective collaboration

Capacity to Manage

- Wealthy, rapidly advancing, urban communities mask an underlying **shortage of technical capability**
  - Educational system produces few well- trained environmental scientists
  - Environmental agencies are poorly staffed and equipped
  - Need for active management is not well appreciated

Lack of Scientific Tradition

- Weak environmental science community has limited policy influence
- Idea that management is an active, science-based process is poorly articulated

Lack of Regulatory Capacity

- Environmental management requires that human activities are altered
- For effectiveness - sound regulations effectively applied and generally supported by the community
- Marine environmental law not well developed in region
- Agencies operate in world of changing mandates

Lack of Effective Collaboration

- The Gulf is intrinsically shared
- Neither fishery stocks nor deleterious environmental impacts honor political boundaries
- Despite collaborative structures such as GCC, CAMRE, and ROPME, collaboration to strengthen environmental management has proved difficult

Recommended Steps to Improve Management of the Gulf

- Strengthening the science community will take time
  - Recently increased research funding an important step
  - Engage international scientists to collaborate with academic and governmental scientists in the region in strengthening understanding of the Gulf ecosystem
  - Build satisfying academic and governmental career paths for environmental scientists who have left the region for doctoral or post-doctoral study

Recommended Steps to Improve Management of the Gulf

- A need to strengthen governmental agencies.
  - Expert **review** of mandate and **organizational structure** of each existing management agency in each country
  - Follow with a reorganization that will clearly **separate scientific** (research) **and regulatory** components, will avoid overlapping mandates, and will **identify gaps** in coverage
  - Provide **new instrumentation**, advanced training of some staff and targeted hiring of **well- qualified** scientists

Recommended Steps to Improve Management of the Gulf

- Expert review of marine law and other environmental law in each country to identify weaknesses and gaps
  - Consider collaborating with neighboring countries to identify similarities and differences in current law
  - New legislation to correct deficiencies, while also reducing conflicts of law between adjacent states
  - Ensure that legal instruments adequately support the management function

Recommended Steps to Improve Management of the Gulf

- Coastal development has major impacts - strengthen EIA,SEA process as a top priority
  - Expert review of existing requirements and procedures to identify weaknesses, and propose changes
  - Undertake needed strengthening
  - Articulate that effective EIA takes time, but pays for itself in better environmental outcomes

Recommended Steps to Improve Management of the Gulf

- Climate change issues will become of major importance in this region
  - Planning to adapt to the environmental changes that will occur, in particular sea level rise and changed rainfall, must be high priority

Recommended Steps to Improve Management of the Gulf

- The shared ecosystem requires cooperative and preferably collaborative management practices
  - Build effective international cooperation by selecting agreed, specific goals that can be realized quickly. One obvious goal – the urgent need to stabilize or reduce fishery yields in the Gulf
  - The Arab Environment Facility or a similar entity might fund specific efforts towards managing the Gulf as a shared regional sea

Summary

- The Gulf is a shared ecosystem worth sustainable management
- Bordering countries have financial resources and appropriate sustainability goals
- Urgent need to build scientific and management capacity if those goals are to be achieved


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