



Environmental Issues in Kuwait

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Introduction

Kuwait is located at the north western part of the Arabian Gulf.

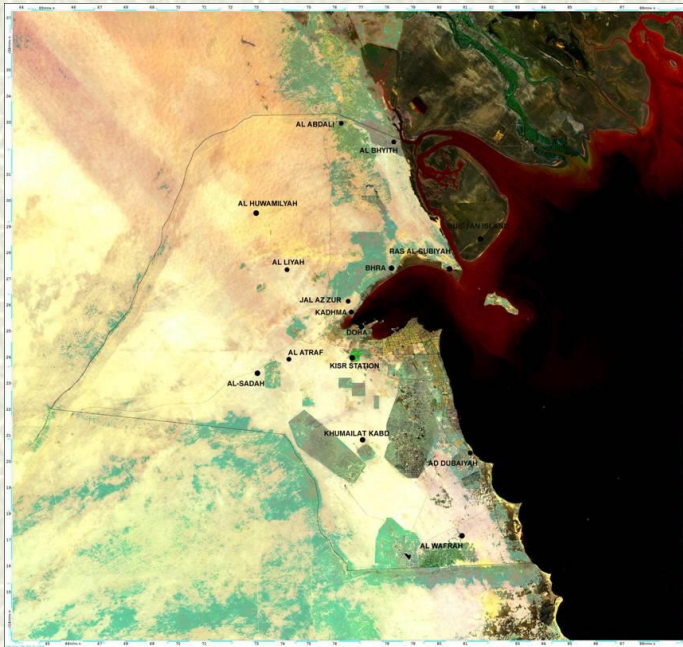
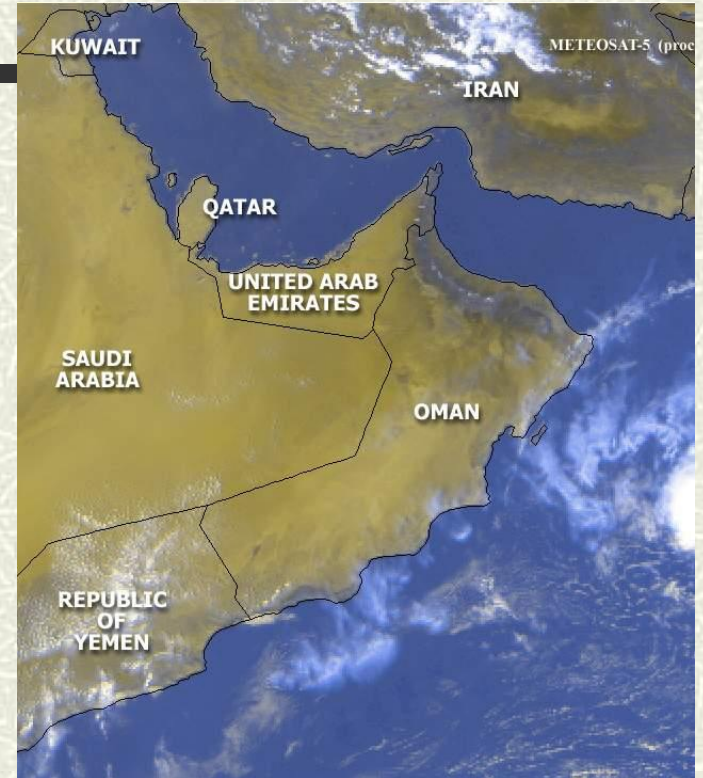
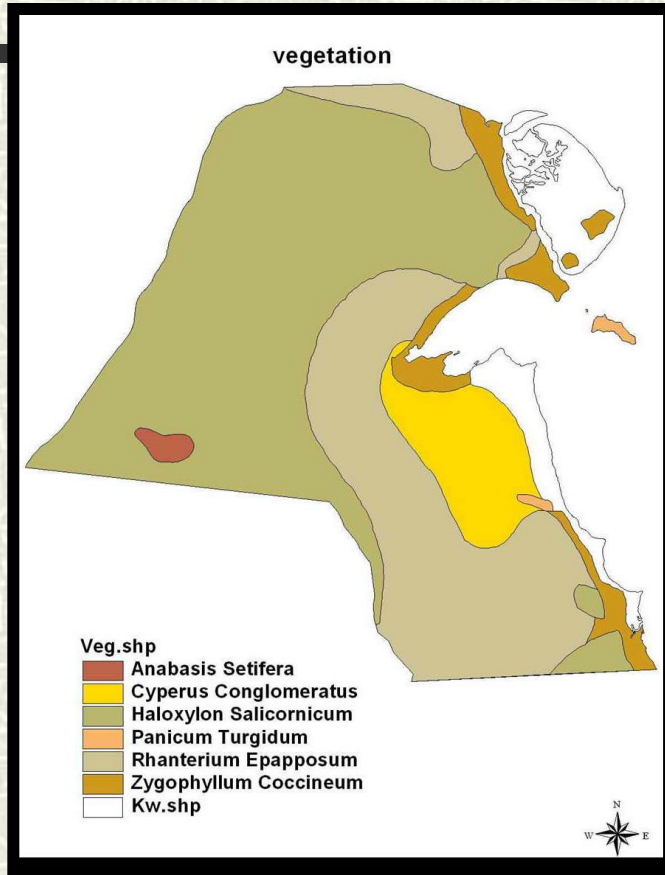


FIG. 1. Proposed of Site Location
Landsat 7 Enhanced Thematic Mapper Plus, bands 2, 4 and 7
The image was recorded during April-May 2003.

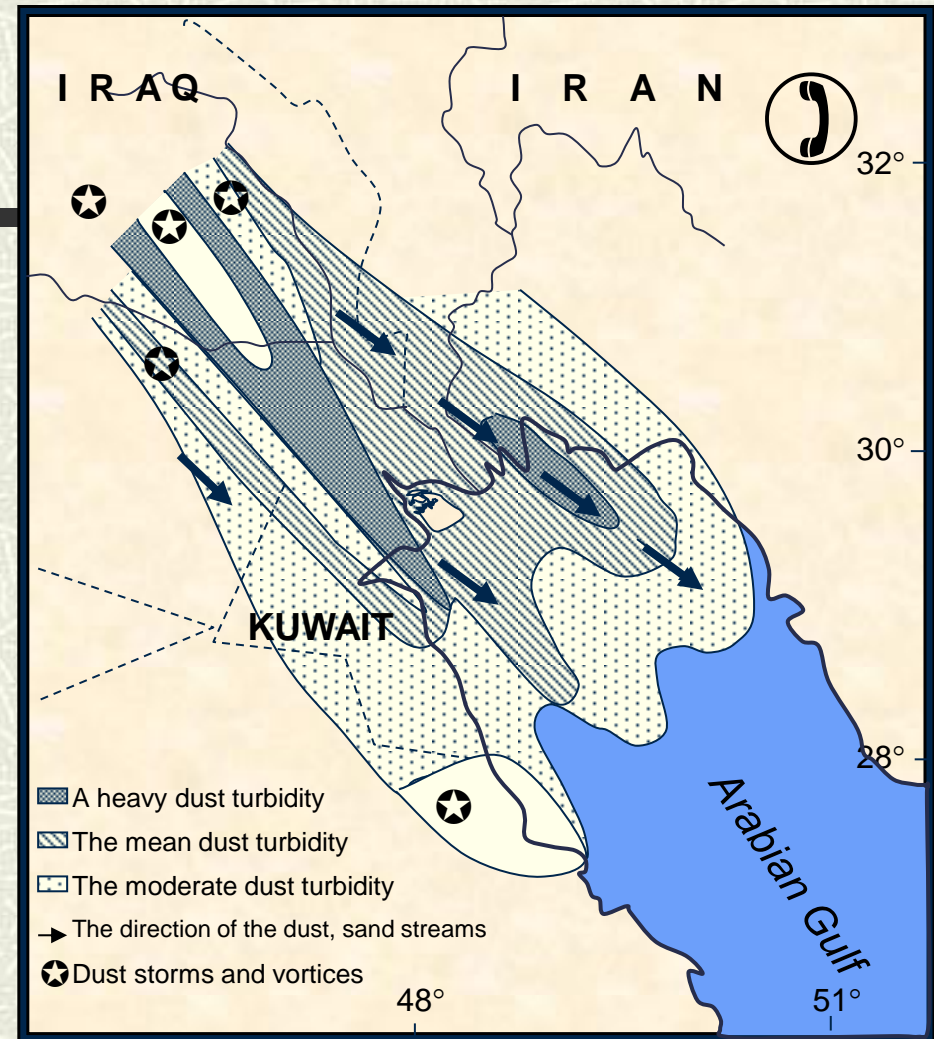
It is an arid region with harsh environmental condition as manifested by high air temperature that reaches more than 50 degree centigrade in summer period.



Kuwait Environment



Low vegetation cover with high wind speed from the North West generates several dust storms that adversely impact the condition in the area.



The dust storms are associated with considerable amount of suspended particulates as well some pollutants that are adsorbed to such particles.

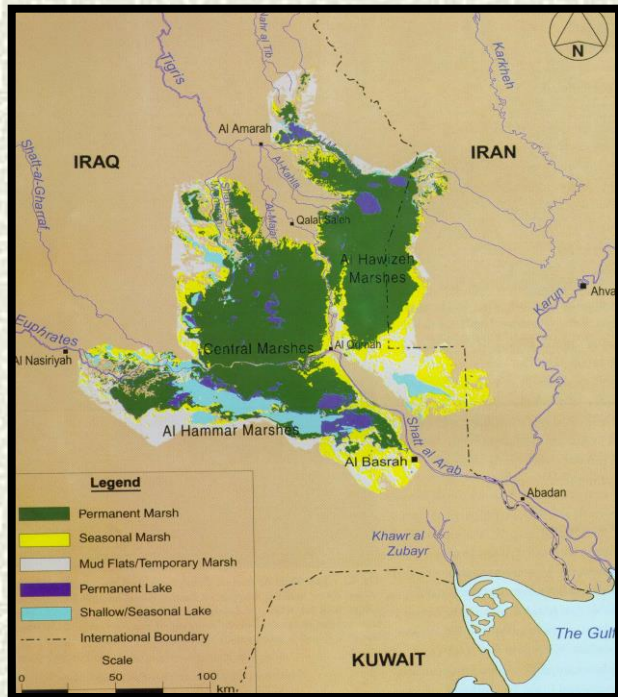


The complex political situation in the region and the activities related to the nuclear facility in Iran may add more stress to the environment in this part of the world.



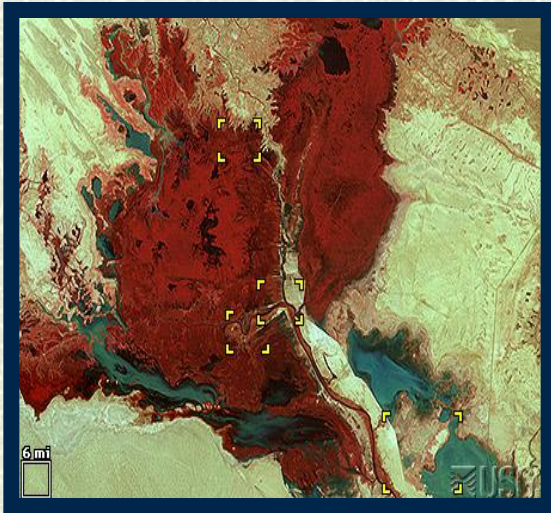
Two important examples can be another good example

- # The first is the oil slick resulted from the first Gulf War in the late 70s.
- # The second example is the impact of draining the Iraqi marshes, as pollutants reached the area as well the change in water quality and the ecosystem.





Temporal Changes in the Marshes of Southern Iraq



1972



1990

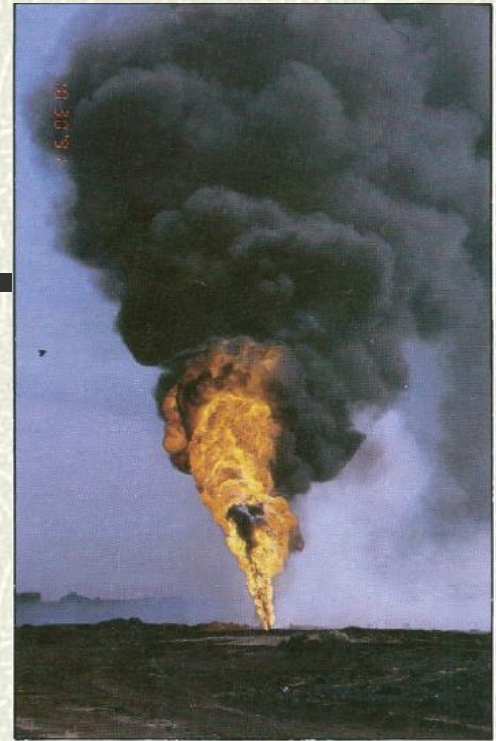


1997



The impact of 3 Wars in the area.

- # The north western part of the Arabian Gulf in general and Kuwait environment in particular has faced with an ecological disaster as a result of 3 wars in the region.
- # Kuwait environment is still suffering serious degradation of its air, marine resources, and soil.
- # During the 1991 war, huge lakes of spilled oil fouled desert sands, and millions of liters of oil flowed into the Arabian Gulf, threatening wildlife and fisheries in the region and Kuwait in particular.
- # Oil wells that were set ablaze created soot that covered the countryside. Some of the environmental damage may be irreparable.





The impact of 3 Wars in the area.

- # More than 780 wells have been destroyed, damaged or set on fire.
- # In November 1991 the last of the burning oil wells had been capped, but the scale of damage to the Kuwaiti economy and ecological environment was just beginning to be assessed.
- # Hundreds of miles of the Kuwaiti desert were left uninhabitable, due to the accumulation of oil lakes and of soot from the burning wells.
- # Normally one to two millions of migratory birds visit the Gulf each year on their way to northern breeding grounds, and it has been documented that thousands of migratory birds indigenous to the Gulf region were killed as a result of the exposure to oil soot or polluted air.



The impact of 3 Wars in the area.





The impact of 3 Wars in the area.

- # More than 800 kilometers of Kuwait and Saudi Arabian beaches were oiled and marine wildlife was divested. In fact, birds were the hardest hit of any group of organisms and thousands lost their lives.
- # The spillage of oil into gulf stemmed from the overall reliance on water in the region.
- # 70 to 90 percent of the population depends on desalination plants for fresh water supplies, and the oil spillage threatened the precious desalination plants as well as power plants and industrial facilities all along the southern coastal area of Kuwait and the coast of Saudi Arabia.
- # As to the direct impact on human health, health experts noted that the residual effects of the hydrocarbons in the air on peoples' bodies would precipitate a dramatic increase in lung cancer and birth defects across the region in as little as 15 years. Other scientists predicated that Kuwait's' death rate could rise by as much 10 percent within a short time frame"



The impact of 3 Wars in the area.

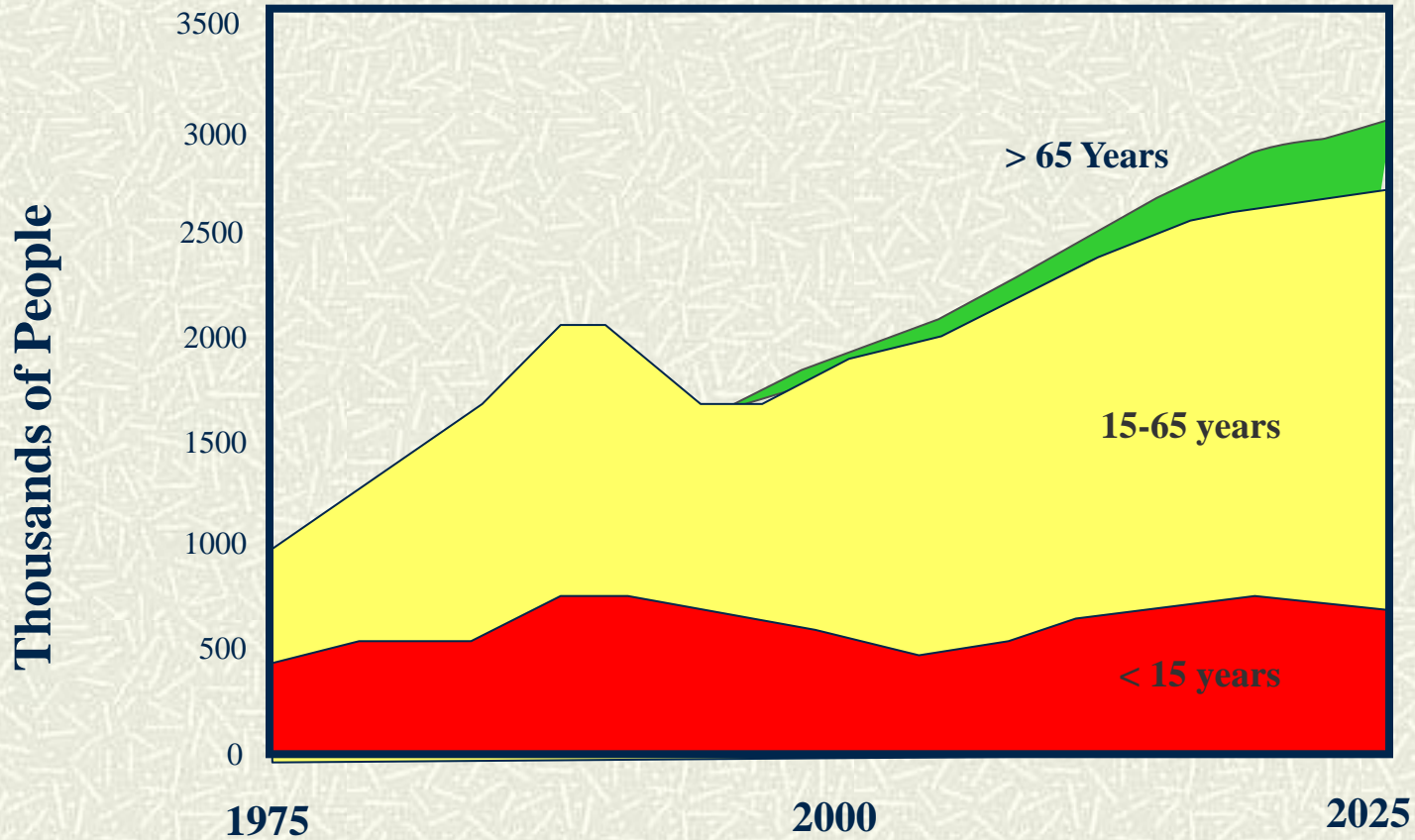
- # By September 1995, Kuwait had filled a \$385 million claim against Iraq for compensation for environmental damages due to Iraq's occupation of Kuwait. ground water resources, and desert environmental damages.
- # In February 1997, Kuwait and its allies, including the United States, filled billions of dollars' worth of claims against Iraq for environmental damages caused during the Gulf War. "

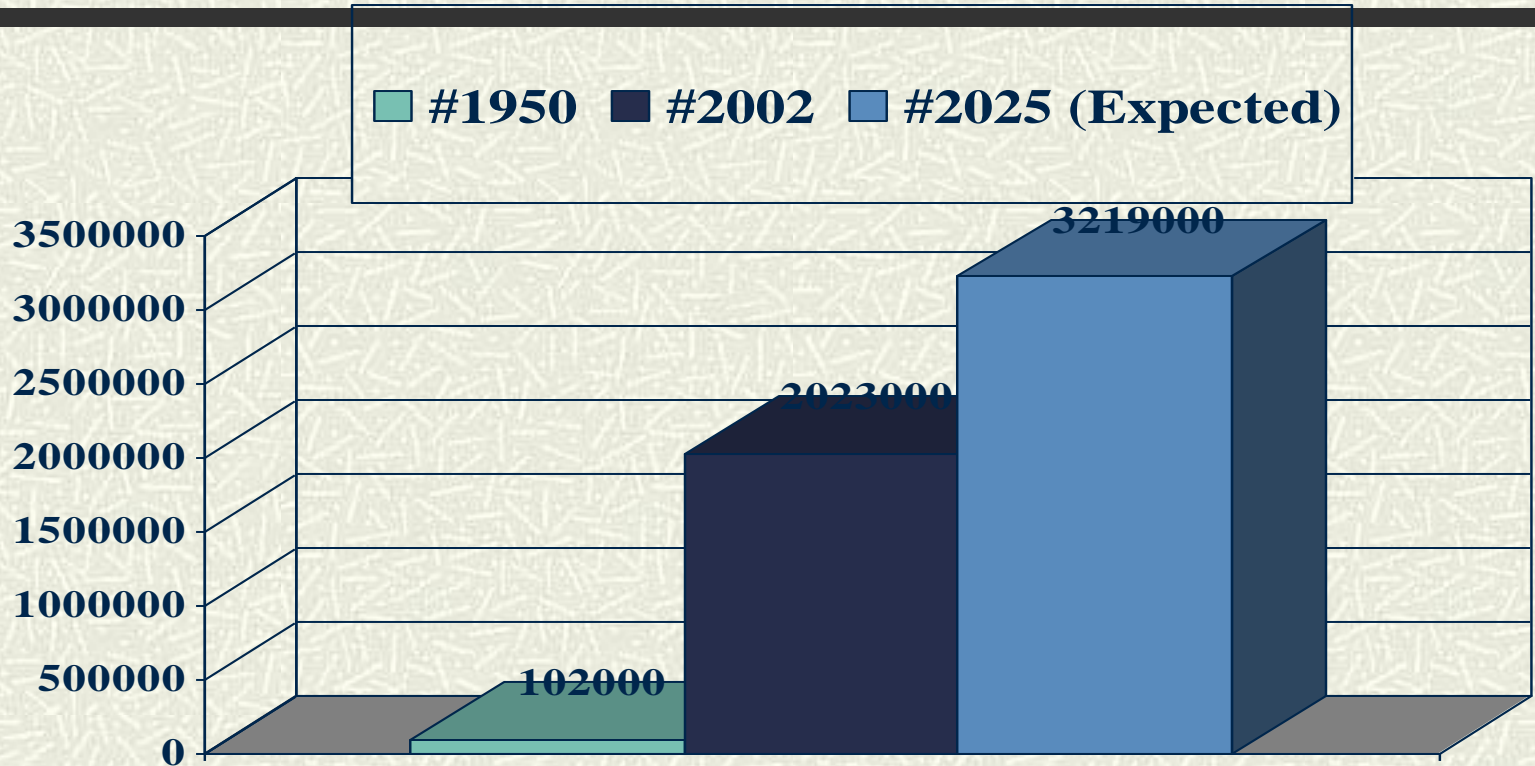


Natural and human Characteristics



Population





Population Trend

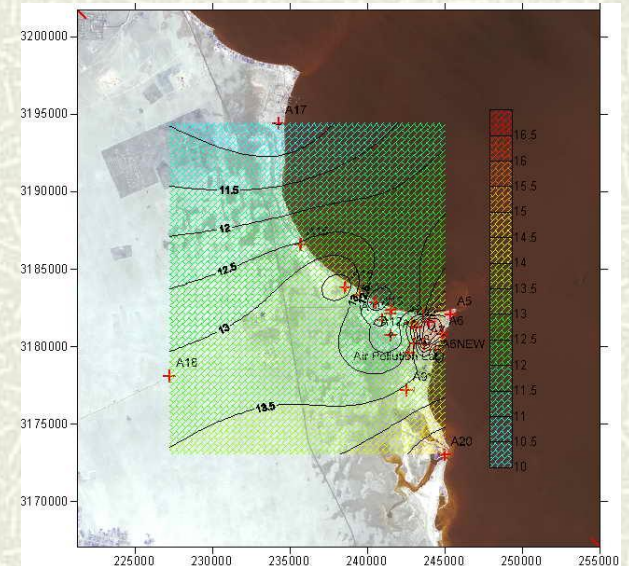
المصدر: www.erathrends.wri.org



Natural and human Characteristics

Outdoor air quality

Indoor air quality





Environmental health



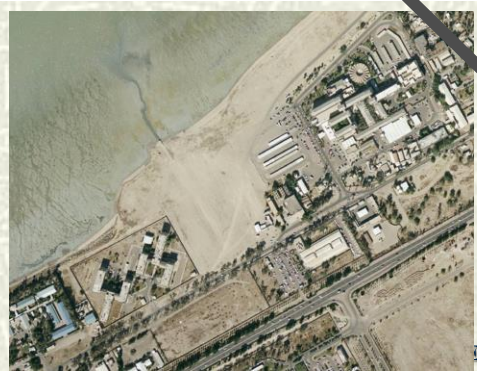
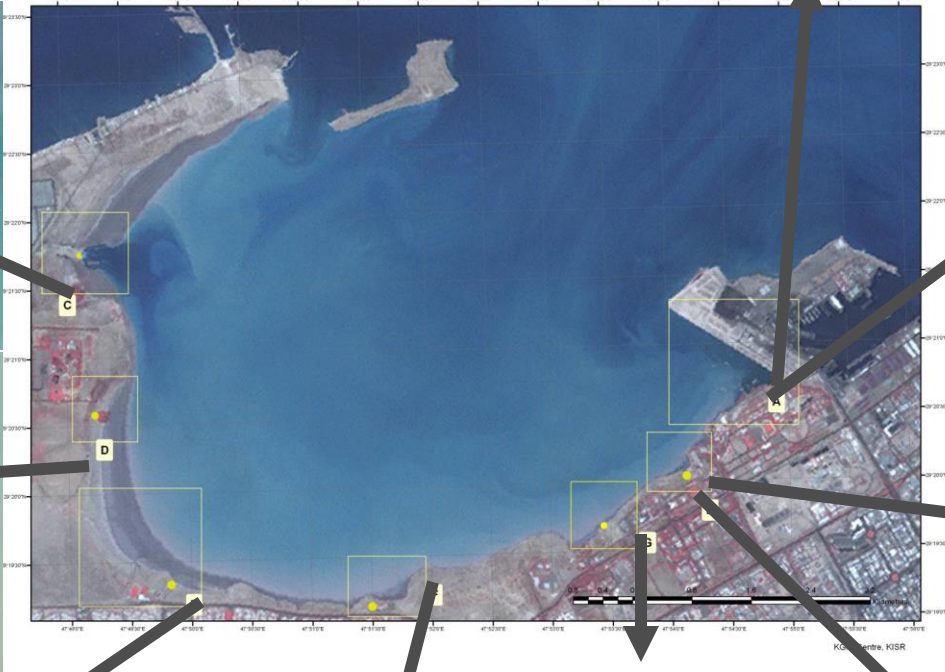
Environmental health

- # **Water resources**
- # **Sanitary wastewater**
- # **Management of hazardous, medical, and solid wastes**
- # **Healthy housing or accommodation**
- # **Health and work environment**
- # **Food safety**
- # **Environmental health information system**



Sewage "Example, Suliabikhat Bay"

2005





Rehabilitation of the Iraqi marshes



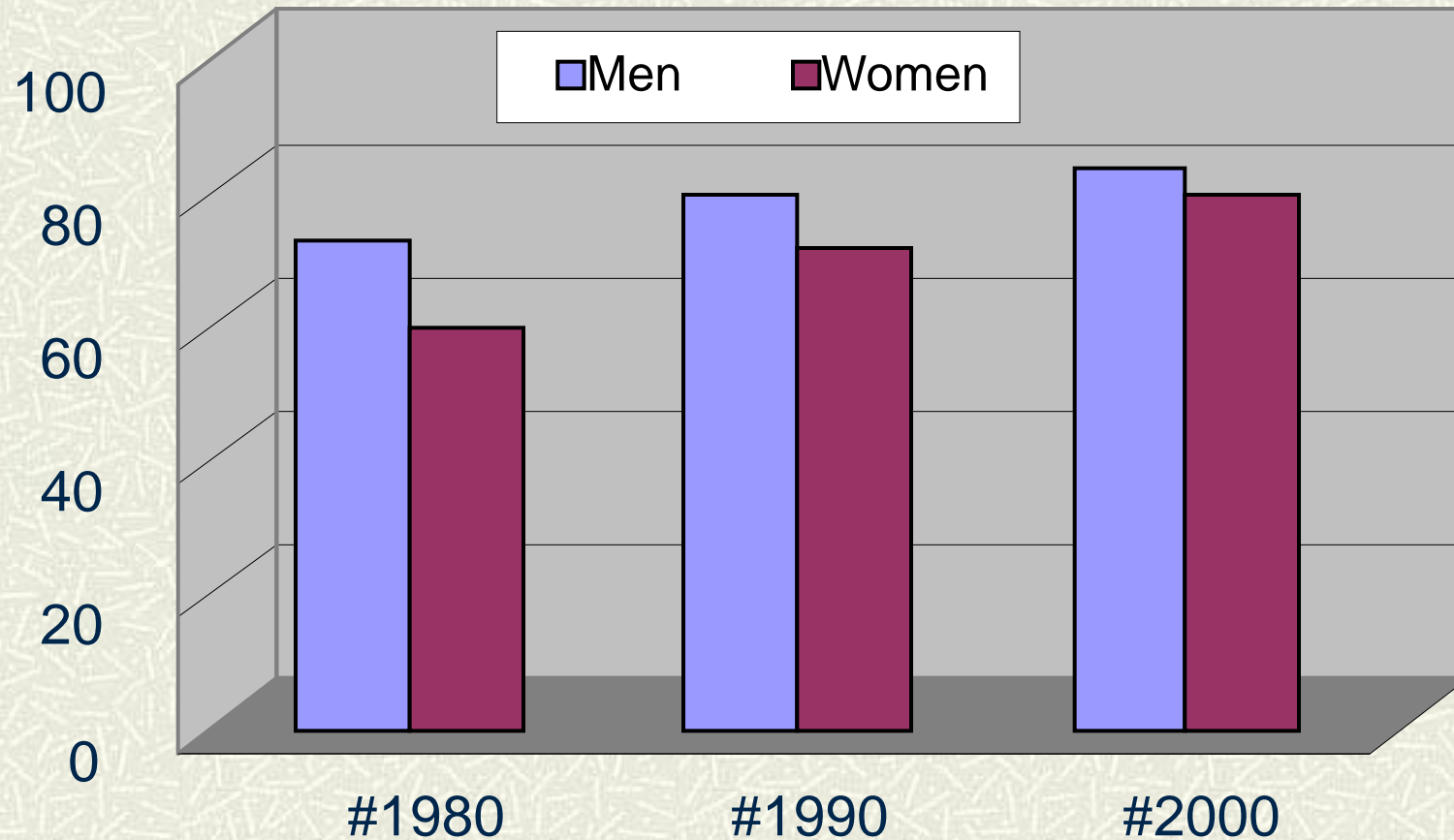
Sunken vessels and their impacts to water quality



Environmental education



Literacy (>15 years old)



www.erathrends.wri.org :source



Environmental education

Environmental awareness issues in

- ‡ **Decision making**
- ‡ **Amongst different groups of society**
- ‡ **Reinforcement the concept of participation and consultation in environmental conservation**



BF	RF	ICF	VI	RSI	Rank	Symbol
5	0	0	10	15	6	Orange
4	0	0	9	13	5	Light Orange
3	0	0	8	11	3	Light Orange
4	1	9	7	21	10	Dark Red
1	5	8	3	17	8	Red
0	4	10	4	18	9	Red
0	3	0	1	4	1	White
0	3	0	2	5	2	White
2	2	7	5	16	7	Orange
4	2	0	6	12	4	White

Apply Dismiss





Select a Sector

Mines Found

Sector

Area(Km2)

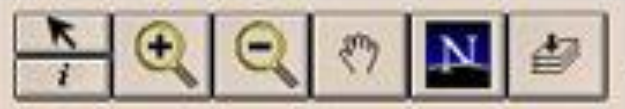
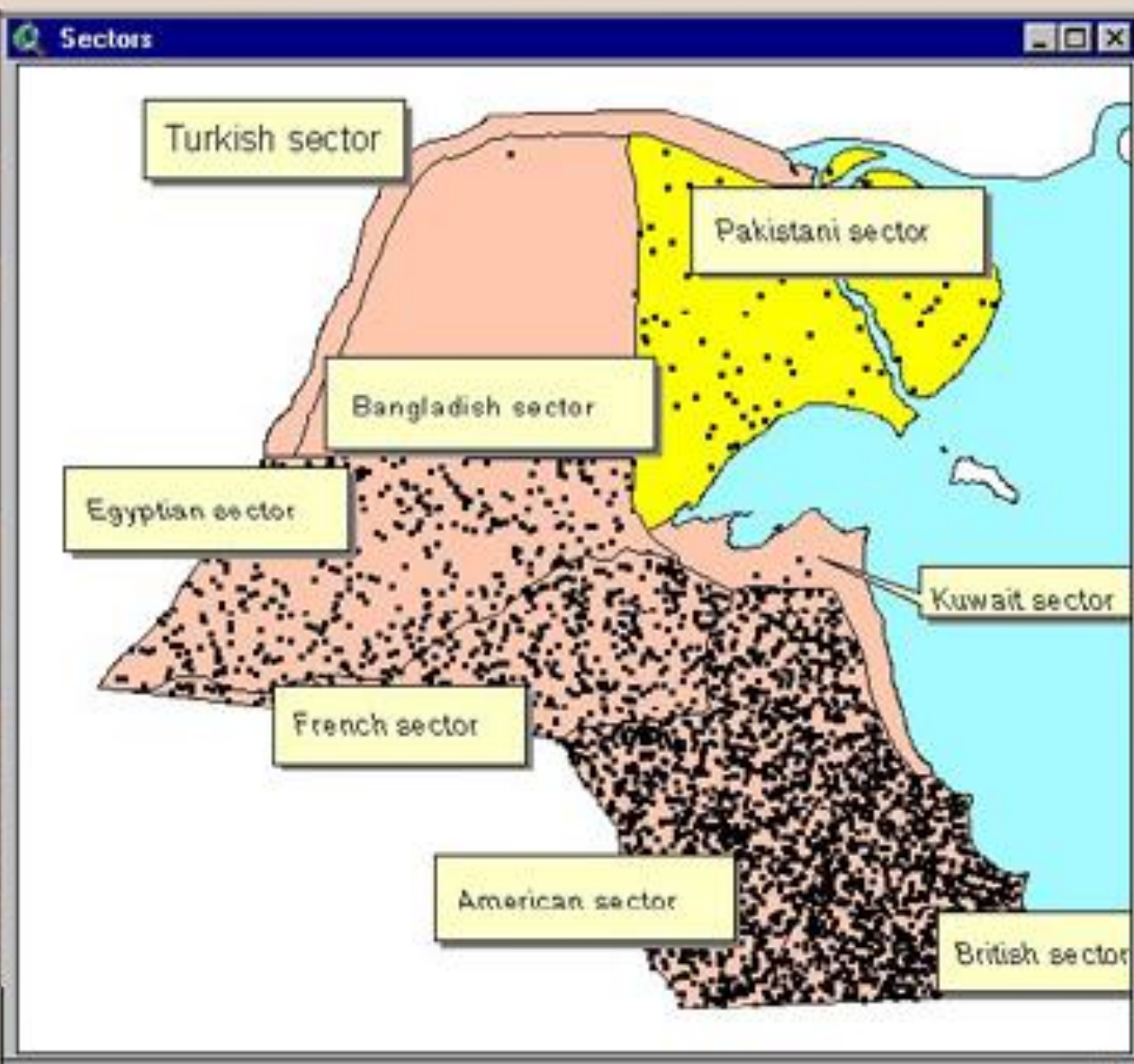
Total Anti-Tanks Mines

Stored Anti-Tanks Mines

Stored Anti-Tanks Mines (%)

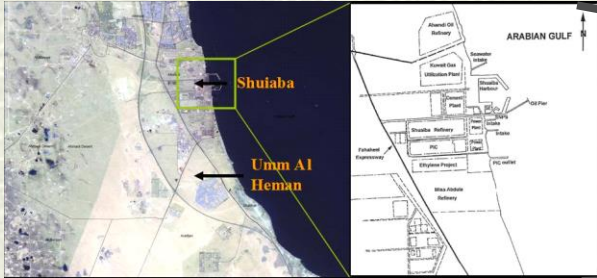
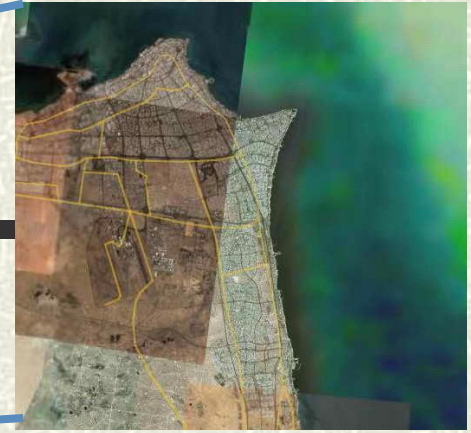
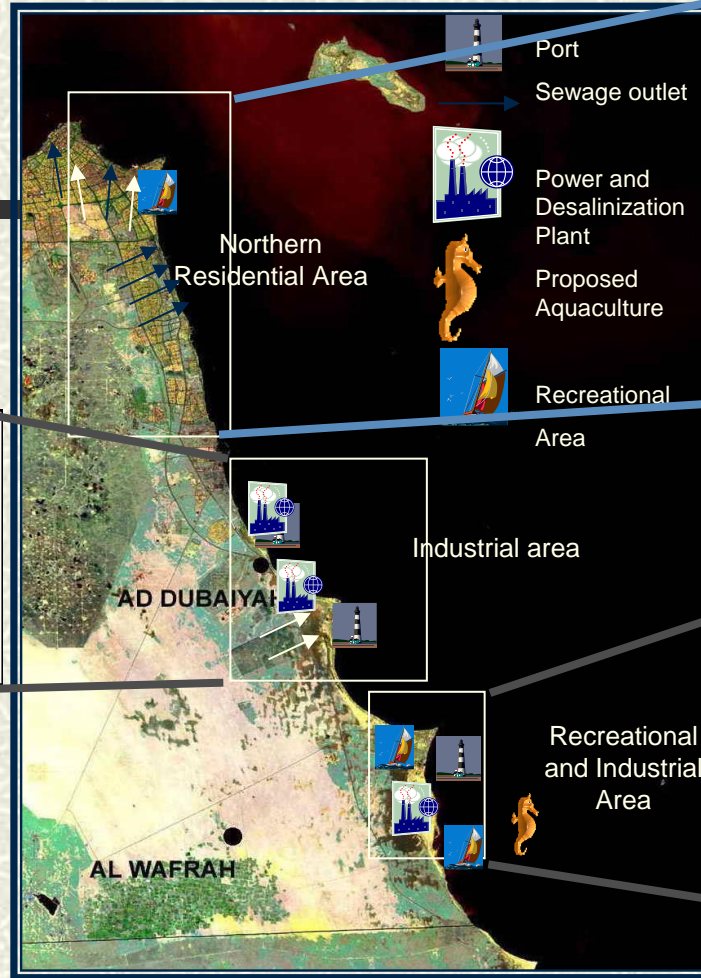
Destroyed Anti-Tanks Mines

Destroyed Anti-Tanks Mines (%)





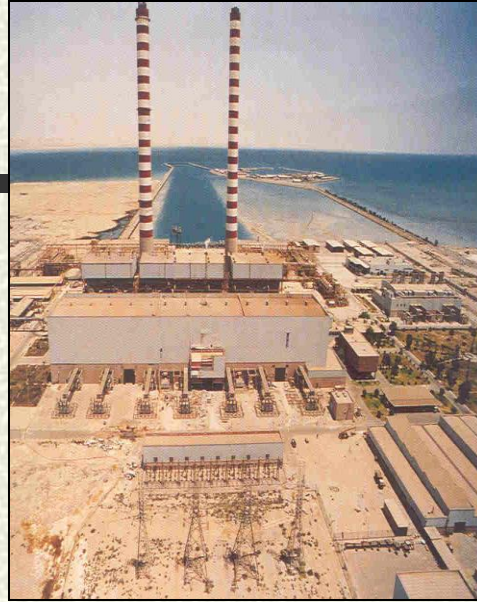
Natural and human Characteristics



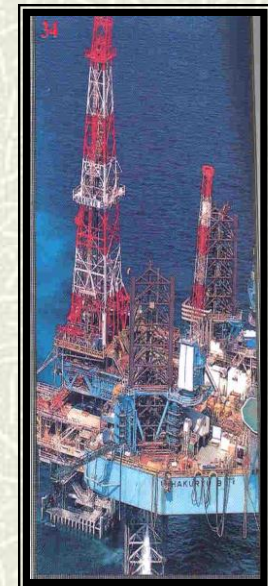
Rapid population growth along the coastal region as a result of oil booming period is imposing an increasing pressure on the coastal ecosystem as more untreated municipal wastewater being dumped into the coastal area through more than 12 inlets.



Other organic and inorganic contaminants are also spilled into the area as a result of several activities along the coastline.



The outputs of other industries are also spilled to the coast line through the outlets that are distributed along the whole coastline. Other industries are another important factor is oil industry that is located along the coastal area. Loading and unloading of tankers for oil is increasing the risk of occurrence of oil slick in the area.





Fresh water resources



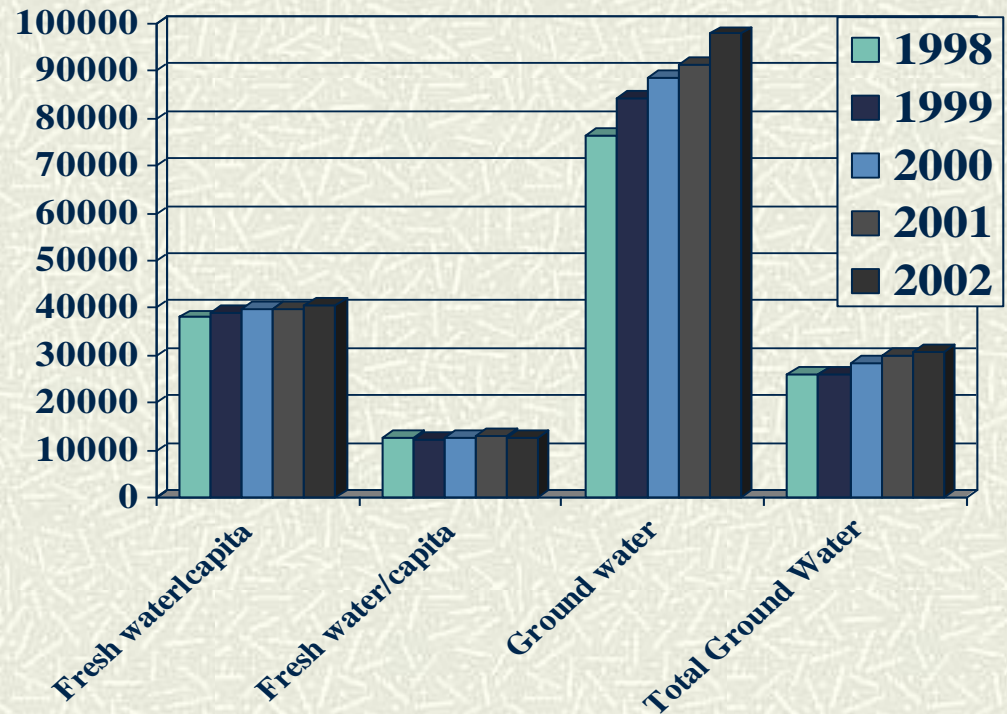
Fresh water resources

- # **Future water needs**
- # **Re-use of treated sewage waters for agriculture and landscaping purposes**
- # **Water pricing to reduce consumption and re-use of water in industry**

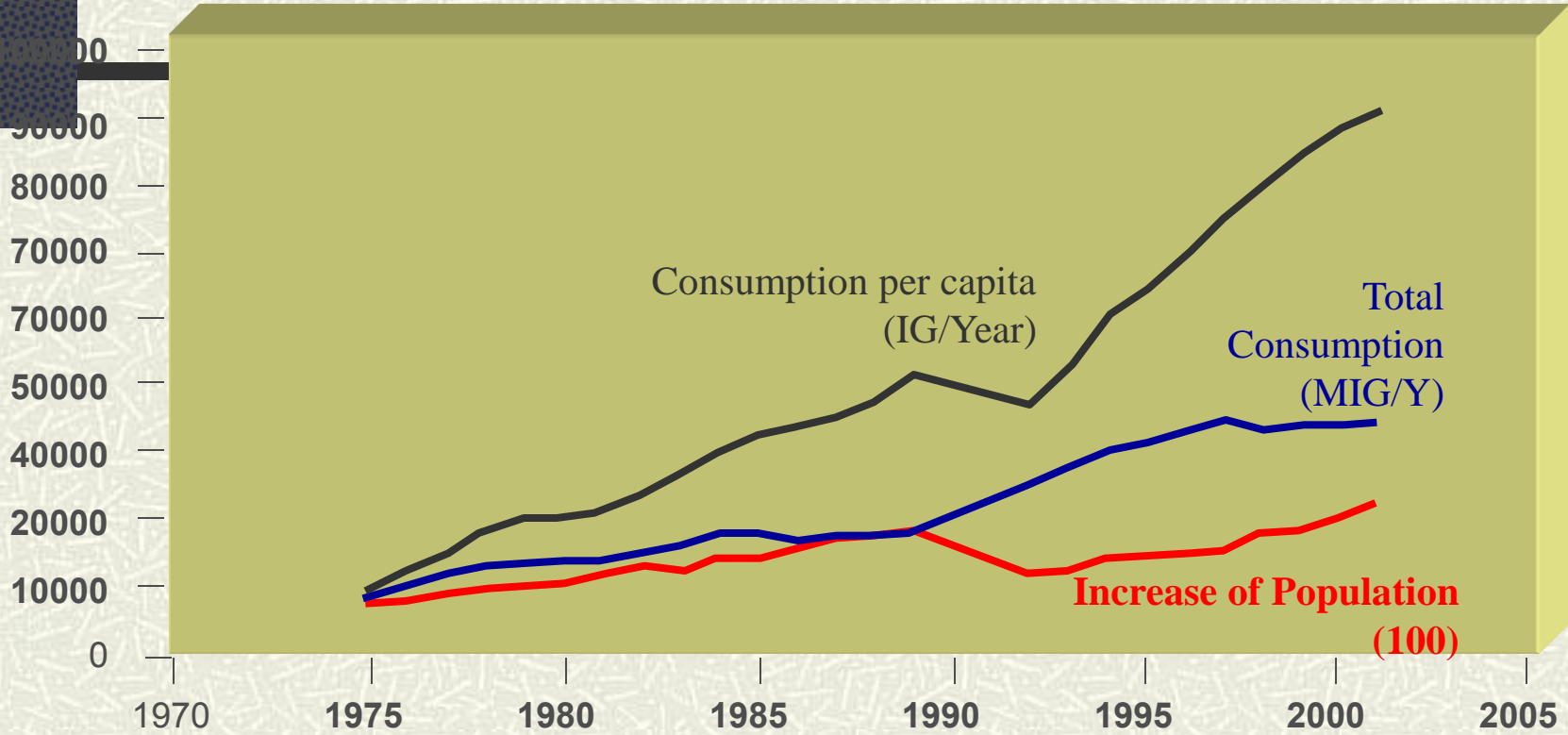


Fresh water

- Increased urban developments has also imposed a lot of demand on water resources on the limited water in the country, combined with increased per capita consumption, presents challenges in terms of human, social and economic development.
- As fresh water is generated from desalination plants, therefore, water consumption levels have led to building of more desalination and power plants which ultimately, result to more environmental degradation of marine environment and deterioration in air quality.



Annual Consumption of fresh and desalination water
(G/Capita, MIG)



Mean water consumption vs total consumption vs increase of population



Industry and energy

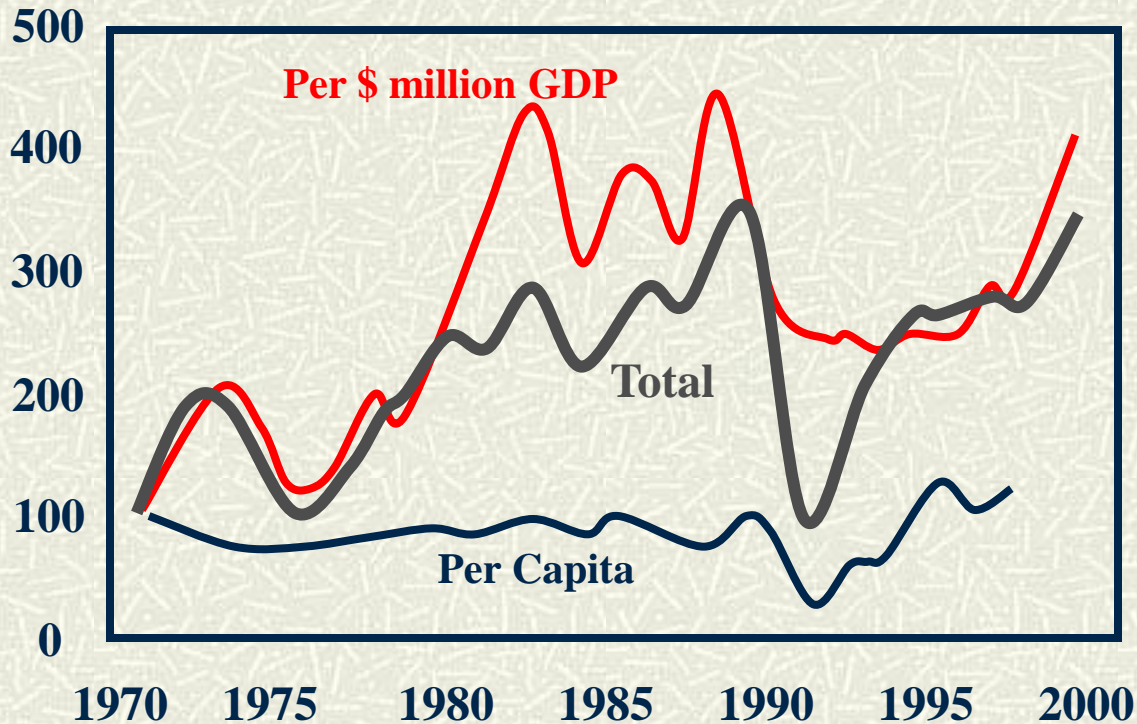


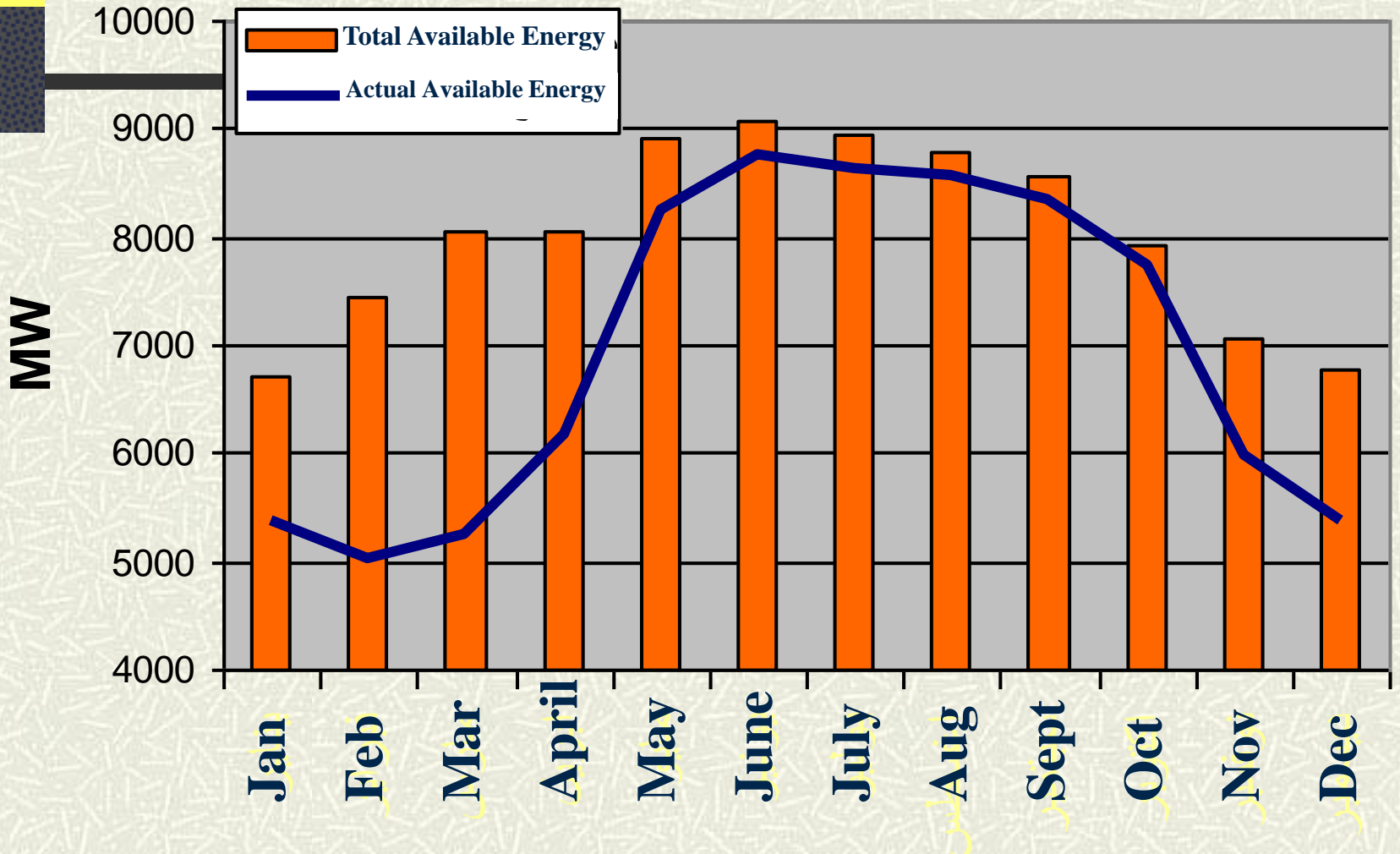
Industry and energy

- # **Equilibrium between industrial development and environmental conservation**
- # **Industrial development**
- # **Population development**
- # **Energy consumption patterns**
- # **Technology**
- # **Industrial wastes and emissions**
- # **Legislative issues**



Energy Consumption: Relative trends, Kuwait 1971-1999





Maximum offered energy and actual consumption in 2003



Wildlife flora and fauna

- # Deterioration of the vegetation cover**
- # Environmental pollution**
- # Extinction of some types of mammals, birds, fish and reptiles**
- # Lack of environmental awareness related to wildlife biodiversity**
- # Incomplete development of natural reserves, rangelands and national parks**

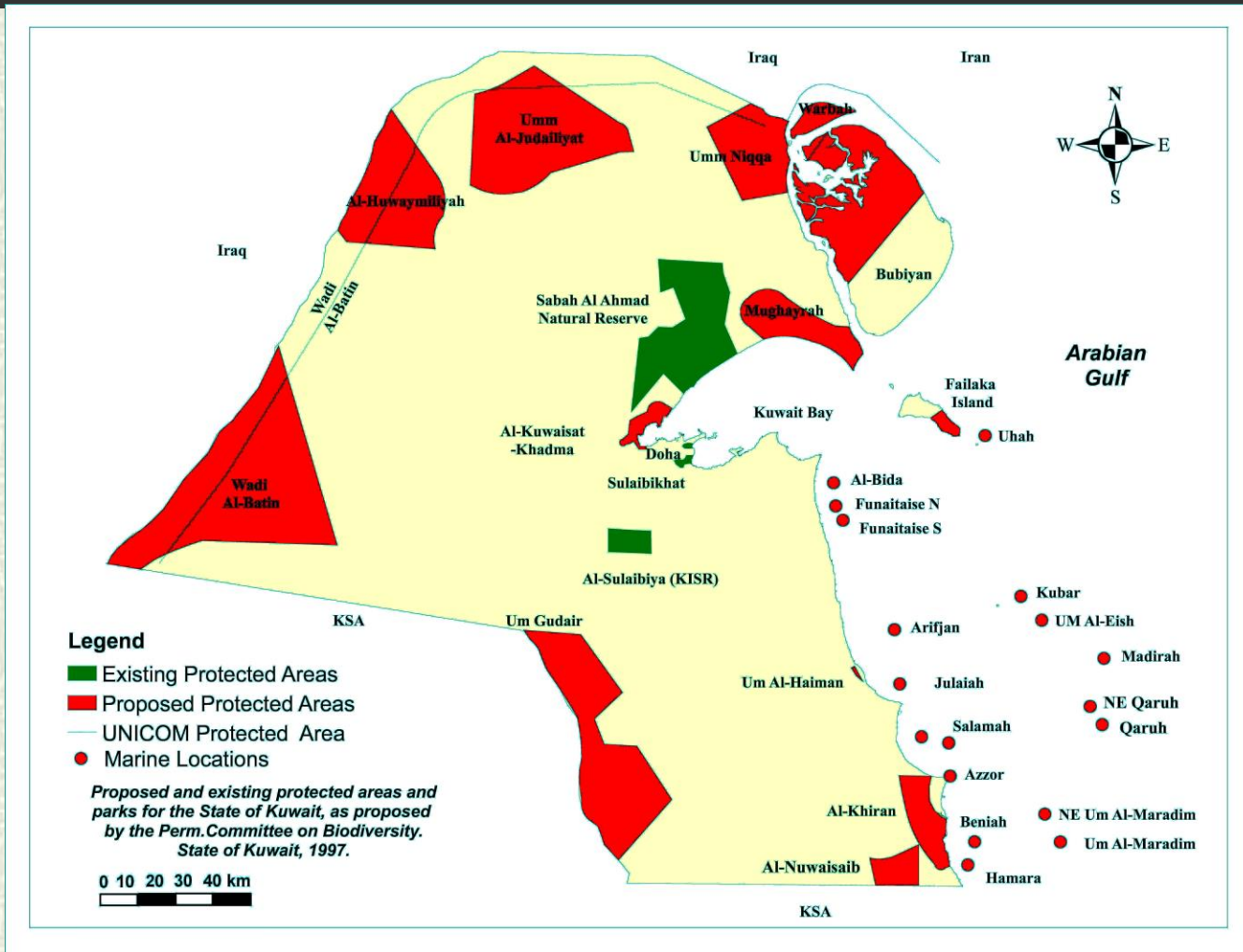


Wildlife flora and fauna

- # **Over consumptive patterns that exploits natural resources and pressurizes wildlife**
- # **Negative impacts of Iraqi invasion on flora and fauna**
- # **Lack of financial support**
- # **Reduction in the implementation of laws and legislations related to natural resources**



Protected Areas





Urban Environment and heritage

- # Loss of architectural characteristics
- # Urban pollution
- # Increasing pressure on available resources
- # Influence of natural phenomena on the urban environment
- # Absence of housing strategy



Urban Environment and heritage

- # **Lack of environmental awareness**
- # **Compliance with environmental legislation and laws**
- # **Freedom to access information**
- # **Financial and economic issue**
- # **Presence of harmful and polluting utilities and services**



Agriculture and land-use

Environmental issues for the landscape and agriculture sector

- # **Water resources deterioration**
- # **Low soil capacity**
- # **Sand drifting and accumulation problem**
- # **Harsh climate condition**
- # **Oil spill incidents**



Agriculture and land-use

- # **Irrational uses of pesticides and hormones**
- # **Diseases and blights**
- # **Decrease vegetation cover and the increase of deteriorated lands due to the irrational land exploitation.**
- # **The second Gulf war 1990-1991**



Coastal and marine

- # **Pollution of coastal waters**
- # **Violating of the sound use of the coastline**
- # **Fisheries resources depletion**
- # **Absence of environmental awareness**
- # **Environmental laws and legislation**
- # **Institutional capacity or issues**
- # **Economic and financial issues**

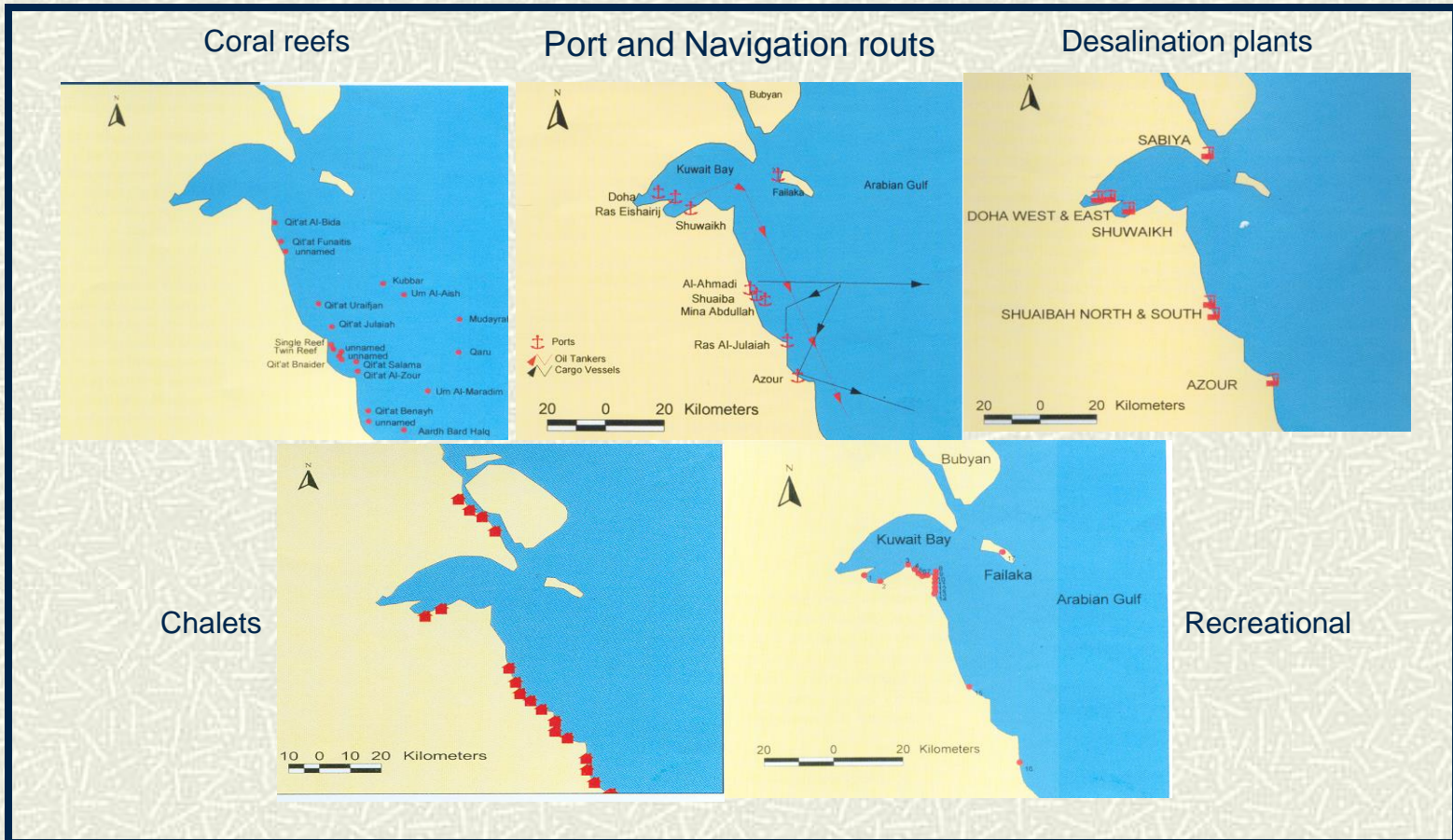


The dominant water circulation is counter clock wise and thus all types of pollutants are also bound to reach the territorial waters of Kuwait.





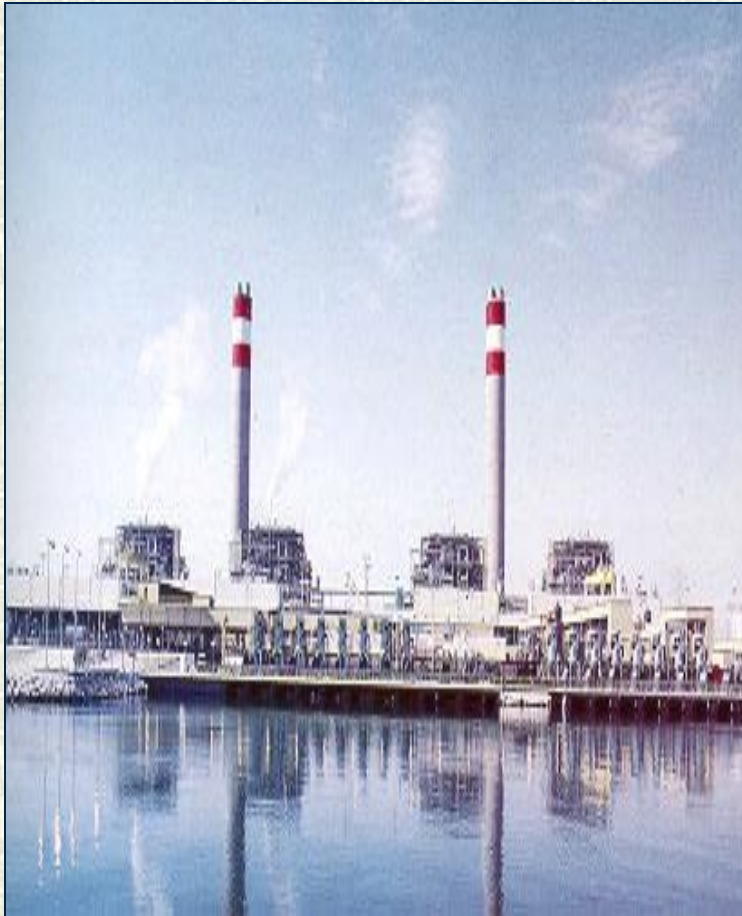
Such activities are ranging from marinas, power plants, coastal reclamation, fishing, etc.





Desalination & Power Plants

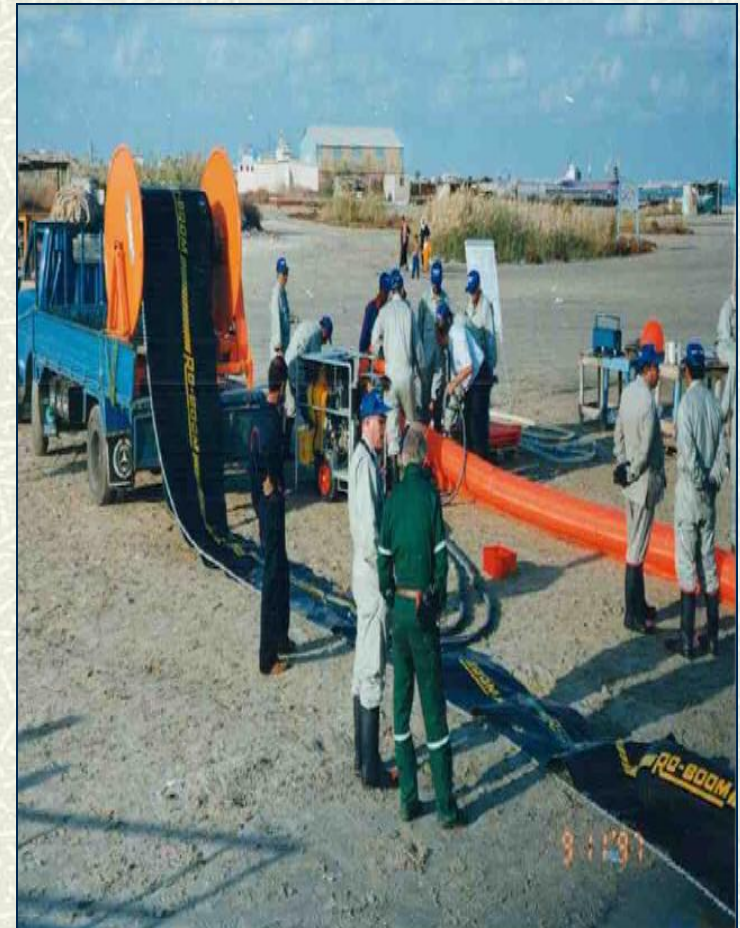
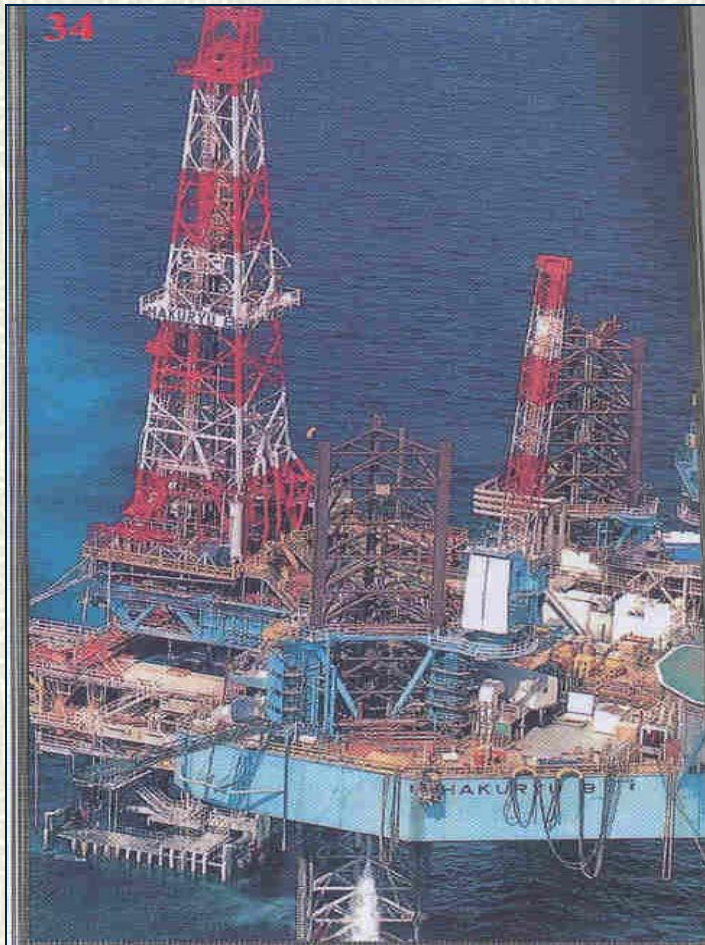
Impacts of Regional Wars





Offshore Operations

Control & Management Of Oil spills



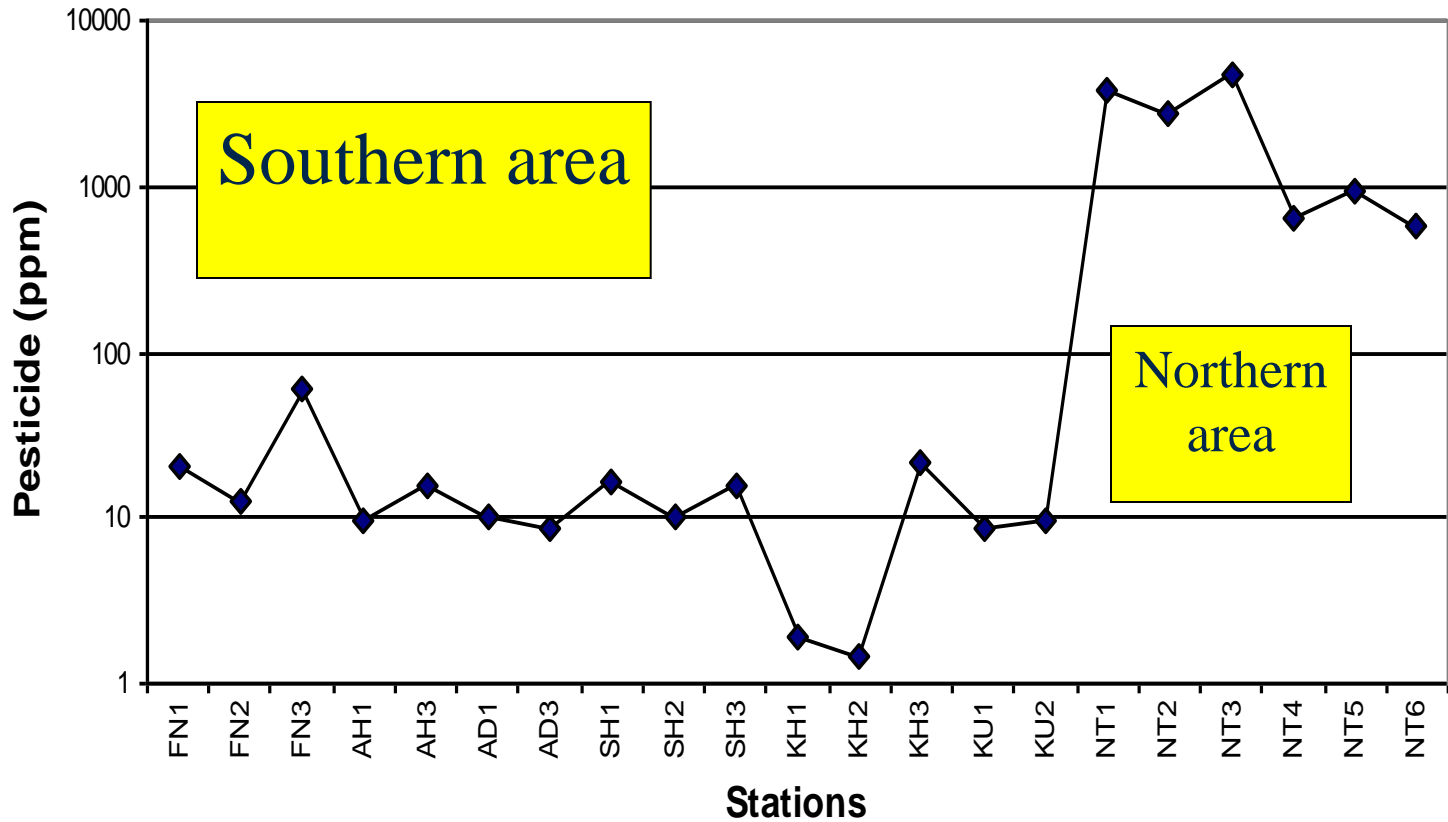


Oil Pollution



Pollution from Ships

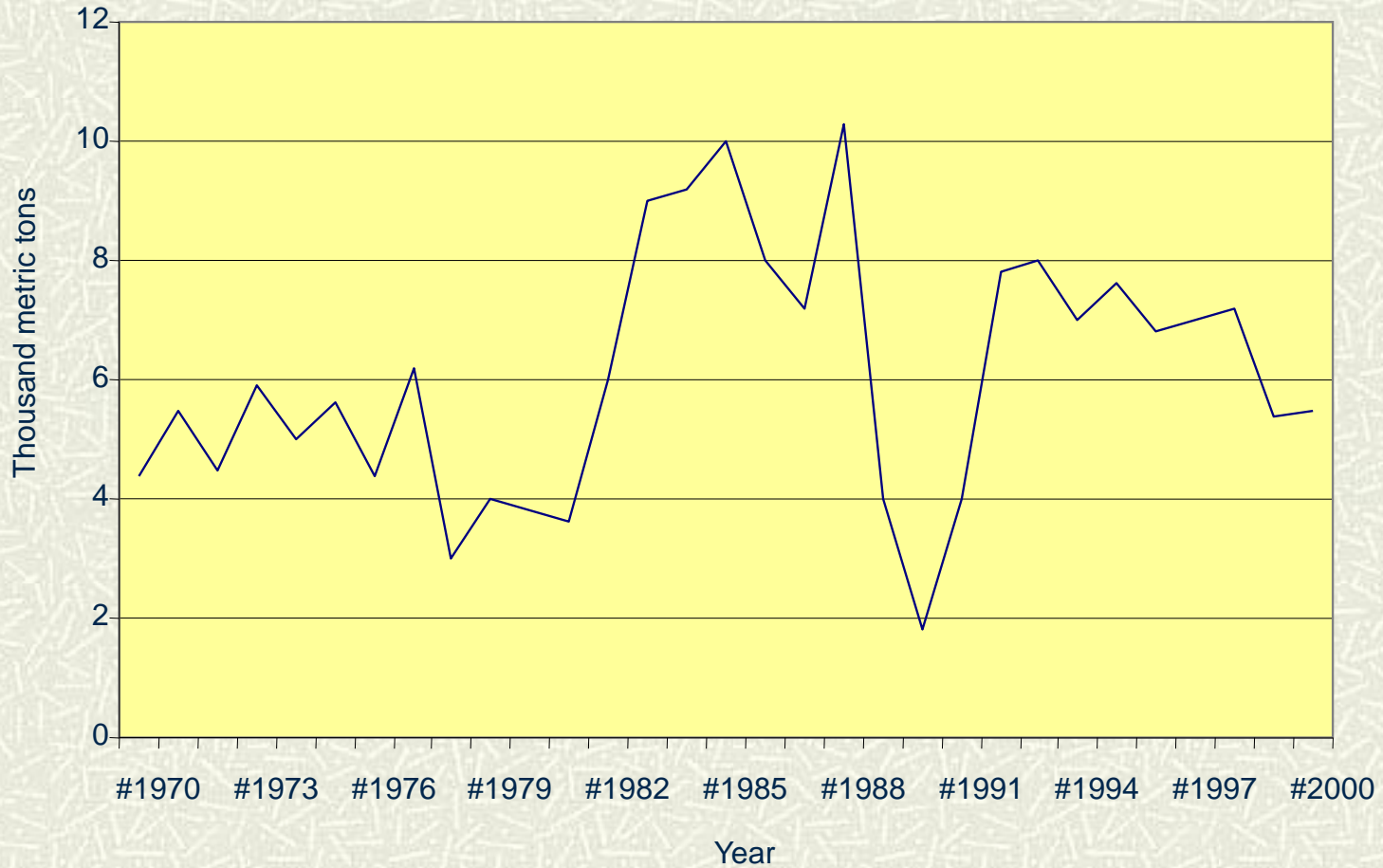


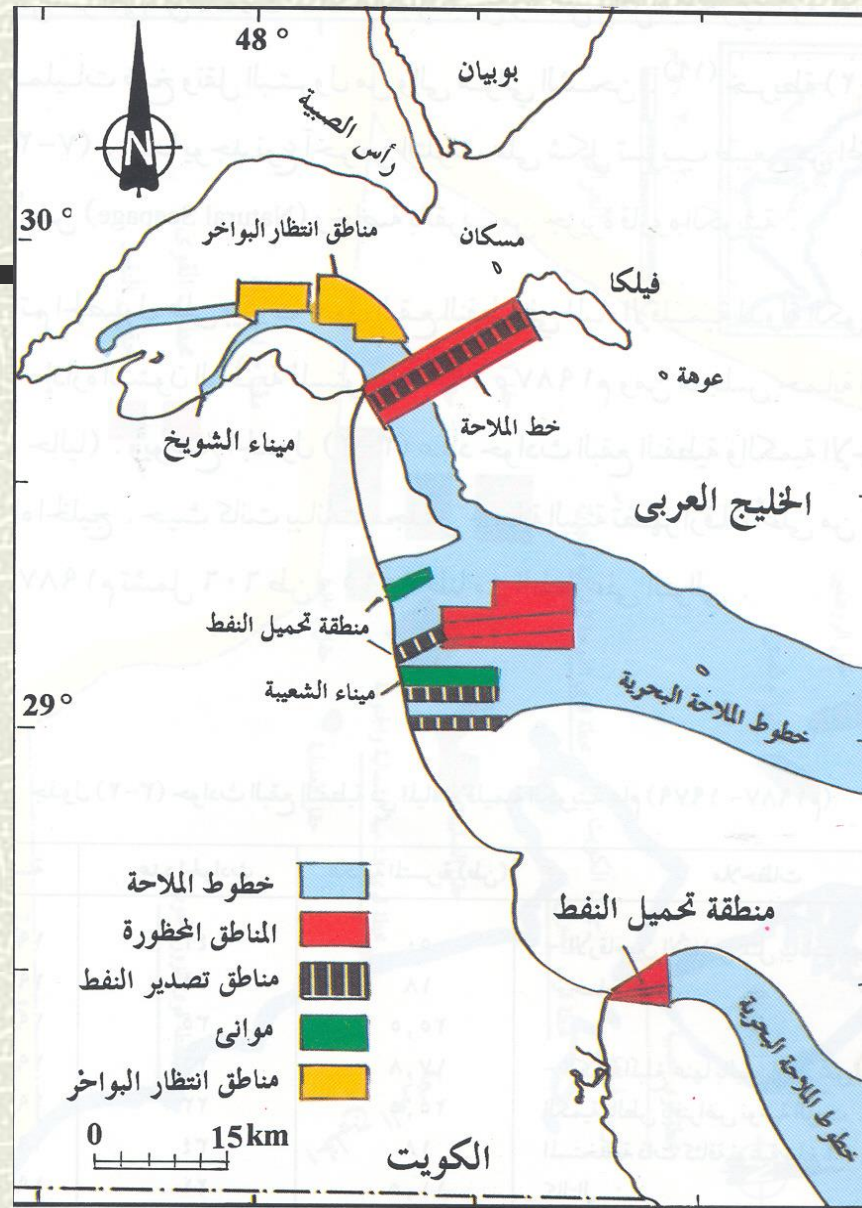


Pesticides in Kuwait's bottom sediments



Mean catch of fisheries per year





Sources of Oil Pollution in the Country (Ali et. Al 2001)

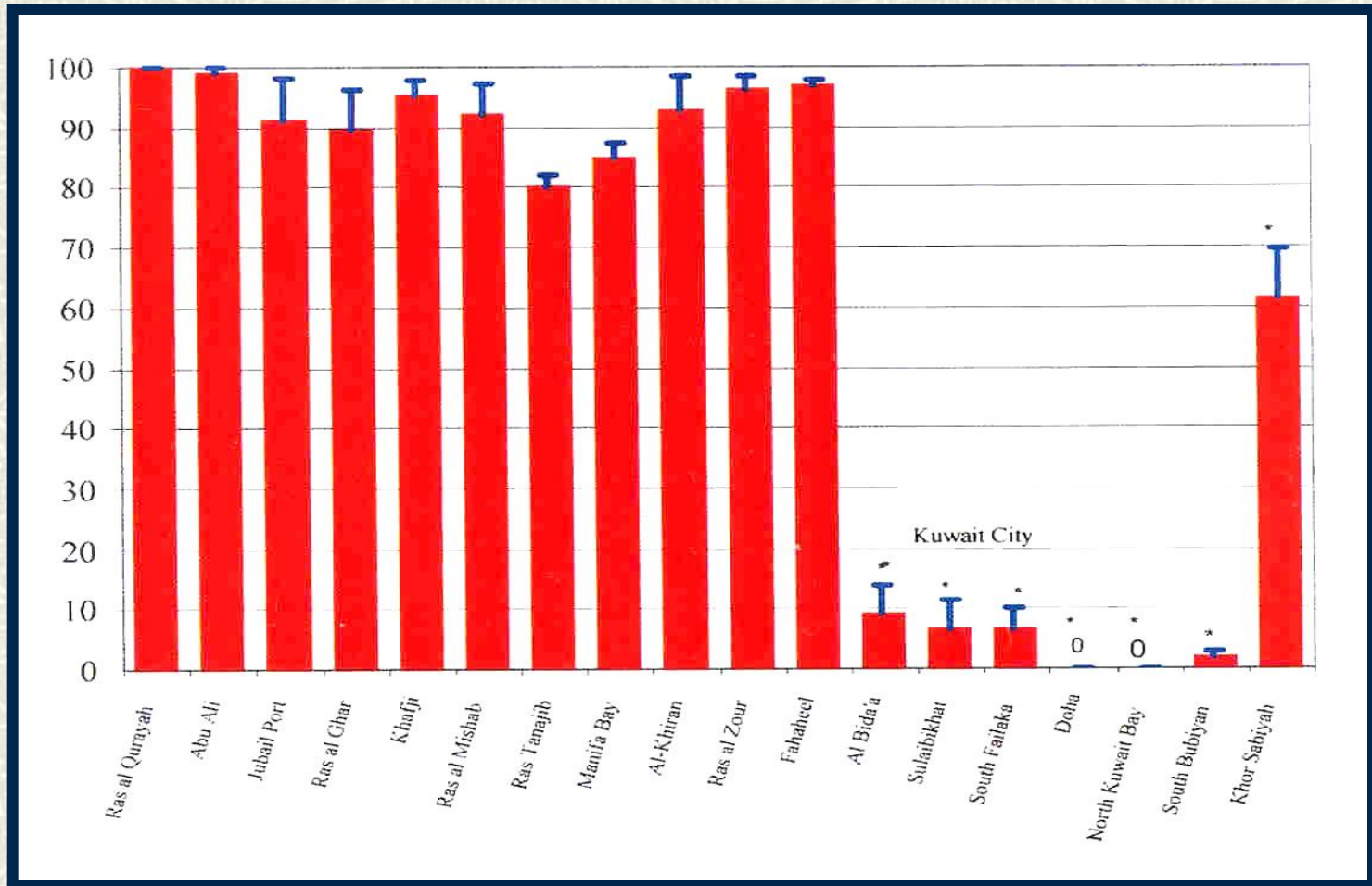


- # Specific groups of contaminants whose observed levels and distribution in the water column, sediments and biota are being used as indicators of the health of the marine environment.
- # The principle marine contaminants are from land-based off shore oil operations and shipping activities, which contribute significantly to the overall impact of human activities on the marine environment.





Toxicity of RSA Beach Sediments





SAFETY EVALUATION OF OIL SPILL DISPERSANTS IN THE ARABIAN GULF





Concerned Environmental Issues.

As a result of the events and activities explained above, the following important issues are summarized here. These need to be addressed in full details and more scientific work should be done to cover these issues.

- # Air quality as a result from petroleum and industrial complexes.
- # Quality of produced water from desalination plants.
- # Land degradation due to urban development and desertification.
- # Lack of environmental impact studies
- # Degradation of coastal and marine environment due to socio economic activities such as power plants, marinas, industrial facilities and municipal culverts.



- # Quality of air , water and soil due to impact of 3 wars
- # Loss of biodiversity due to grazing and over fishing and exploitation of resources in the terrestrial and marine ecosystem.
- # Increased quantity of chemicals from industrial facilities as well as oil industry and waste management of such contaminants.
- # Possible hazards from nearby countries



Thank You