a. Activities on the beaches and other kinds of shorelines lead to multimillion dollar businesses. They involve things like pleasure boating including jet skiing, water skiing, recreational fishing, cruise ships, whale watching.

b. One organization reports that in 2010, the ocean economy employed about 2.8 million people and produced $258 billion worth of goods and services. But, according to NOEP (National Ocean Economics Program), an additional 2.6 million jobs and $375 billion were indirectly associated with or induced by ocean industries. Taking this multiplier effect into account, NOEP says that the ocean economy contributes roughly 4.4 percent of total U.S. GDP (Gross Domestic Product). That's not huge, but it is more than America's creative industries (recently estimated to contribute 3.2 percent of U.S. Gross Domestic Product) or agriculture.

c. The two most significant aspects deal with mineral extraction and the tourism & recreation sectors. The "minerals" sector includes offshore drilling and exploration of oil and natural gas. This business is thriving. Going to the seashore for vacations impacts another number of industries (hotels, food, etc.) It is held that nearly three out of every four ocean economy jobs are in tourism & recreation, but 65 percent of the ocean economy's GDP comes from other sectors. The workers in the minerals sector, who account for only 5 percent of ocean-related employment, contribute over six times that to the total ocean-related GDP.

2. **Food and Transportation**

a. For centuries, it was thought that the ocean could supply an inexhaustible supply of food. We know this is not true. Human populations have grown at a frightening rate and we may soon approach 10 billion. The use of fertilizers on the land has proved dangerous in some ways and the collapse of fishing industries does not bode well. This will require that we produce ever greater amounts of food from both the land and ocean. The development of aquaponics and aquaculture (the equivalent of agriculture on the land) is one possibility.

b. The movement of goods and people across the oceans is another important aspect of businesses involved with the ocean. While general transportation by passenger ship is relatively rare for long trips, cruise ships have taken over moving people for multi day tours around various islands and countries.

3. **Law Enforcement**

a. The seas constituted a *nullus res* something belonging to no one, however many laws have been promulgated relative to the ocean. Some of these have to do with "claiming" a part of the sea – like exclusive economic zones. As a result of a United Nations Convention on the Law of the Sea (1973-1982) and came into force in 1994 one year after Guyana became the 60th nation to sign it. It mad many changes including extending what had been a 3 mile limit out to 200 miles which gives countries. This overruled the old Freedom of the Seas ideas in this the earlier times. Nations now wanted control of local waters relative mineral resources, to protect fish stocks, to deal with pollution and so on. The United States Coast Guard has 4 basic missions (a) military (b) law enforcement (c) marine safety and (d) environmental protection. The many laws that have

been passed from boating while intoxicated to the Marine Mammal Act and the like are often enforced by the USCG.

b. A number of government agencies are also involved. The department of fisheries, the Environmental Protection Agency are just a few.

c. The armed forces are also involved with the oceans, perhaps none more than the Coast Guard, which deals with much law enforcement on the ocean including illegal alien and drug interdictions, piracy, marine safety and environmental protection.

Another aspect of law enforcement that has returned with something of a vengeance is piracy. Not the kind with Johnny Depp where a bunch of people are going around trying to kill dead pirates?!?!?!? Or stealing from the internet, but piracy on the high seas

4. **Scientific**

a. Science is in some ways an "artifact" of the enlightenment. It is hard to say when "science" began since a definition if science is difficult. Early Greek and Roman "naturalists" may be seen for example, as scientists, but not in the modern sense of the word.

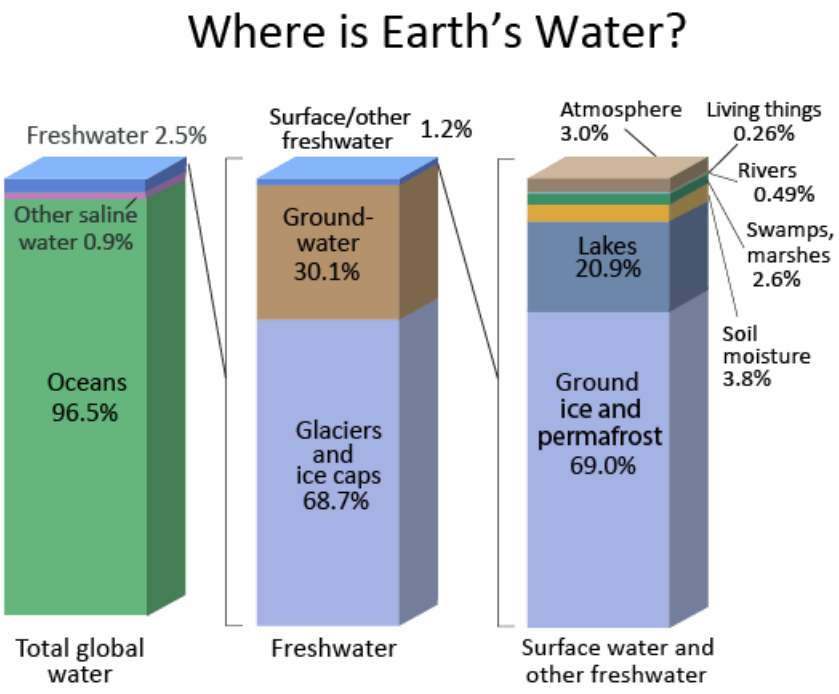
b. Modern science is associated with the enlightenment and the age of reason which is slowly being chipped away by post modernists.

c. Scientific studies of the ocean come late, since the age of exploration has a great impact on the scientific area. The sea is not easily studied and even now, we know more about the surface of the moon than we know about the bottom of the ocean.

d. The study of the ocean involves many disciplines. The physical properties of the ocean are study by physics, chemistry, geology or earth and environmental studies. Biology has an entire division known as marine biology. The social sciences also look at the ocean and the people involved with it. Anthropology and archaeology look at the historical developments of the sea faring as well as the way the sea is involved with many cultures. History, sociology, political science and law are all disciplines that as part of their history have looked at the sea. Maritime law is of major importance in shipping, fishing, and many other areas.

5. The ocean covers most of the planet. All the oceans are connected so there is really only one ocean. For reasons we will talk about later it is possible and reasonable to divide the ocean into many parts – the Arctic Ocean; the North and South Atlantic Ocean; the North and South Pacific Ocean; the Indian Ocean and the Southern Ocean. So while there maybe 7 “oceans” that are often named – there is really only one large body of water.

6. Most of the earth's water is in the ocean – about 96.5 percent. About .9% of the water outside the ocean is saline ("salty") while about 2.5 percent is fresh water. Of the 2.5 % of the earth's water that is "fresh" about 68.7% is in glaciers. Ground water contains about 30.1 of the fresh water while lakes contain about 20.9 percent. Of the remainder about 3% is in the atmosphere; 2.6% in swamps and marshes, 0.49% in rivers and about .26% in living things!



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources.
NOTE: Numbers are rounded, so percent summations may not add to 100.

7. Living things are called the "biosphere" which is like the "atmosphere" which is the air. There is also the "hydrosphere" which is the watery part of the world and the lithosphere which is made of the rocks. Chemicals move from one sphere to the other. The amount of time a chemical spends in any sphere is called its "residence time"

   Atmosphere: the air around the planet
   Biosphere: living organisms on and around the planet
   Hydrosphere: the watery part of the world
   Lithosphere: the mineral part of the world
   Residence time: The amount of time that a chemical remains in a given sphere.

8. **BIASES**

WHAT ARE BIASES AND WHY ARE THEY IMPORTANT?

BIASES

This is something we need to take seriously. It can pervade many things including science. It is most likely to impact the interpretation of the data. One aspect we should note is called “anthropomorphism” which is the attributing of human characteristics to non-humans. A classic example is seeing porpoises or dolphins as “happy” because of their “smile”. The animal is not smiling that is just the way the dolphin’s mouth is shaped. It appears that if we see something that looks human we interpret it that way.

Biases can be personal or cultural and can easily affect the interpretation of many things including data. This is something that many social scientists (even those who are not post-modernists) are interested in. Some are very deeply rooted in the culture or the person's own background and are often invisible to the people involved.

In social science and especially anthropology, there are two terms of importance: ethnocentrism and cultural relativism. These are terms which are often misused so we need to look at them carefully.

Ethnocentrism is trying to impose the categories of one culture onto another in an attempt to analyze the culture. Cultural relativism is the opposite – it means trying to see the culture in its own terms. You don't have to like them, just see how the society is working.

These two terms should be kept distinct from moral relativism and moral absolutism. These have to do with morality not analysis.

An easy example of ethnocentrism and cultural relativism comes from linguistics. For a long time Latin was seen as the "perfect language" so any deviation from Latin grammar was considered improper – even if you were looking at English which is a Germanic language and not a Romance one.
In Latin, verbs have 6 forms

Porto - I carry	portamus – we carry
Portas - You (sing) carry	portatis - You (plural) carry
Portat – he, she or it carries	portant – they carry

English has only 2 forms:

I, you, we, they	carry
He, she, it	carries

But generations of school children had to say:

I carry, you singular carry, he she or it carries, we carry, you plural carry, they carry. Latin has 6 forms, English should too.

This is clearly imposing a Latin structure onto English (other languages by the way have many more forms than Latin!

If we just say English has 2 forms, Latin has 6 we are being "culturally relative". If you are both have six then you are imposing the structure of one on the other.

Moral relativism and moral absolutism are problems about correctness in terms of moral behavior not structure. Some people, for example, have analyzed the caste system in India looking at how it functions in India. Many who did so did not like the system and thought it immoral. So they could be both culturally relative and morally absolute simultaneously.

The concept of “emics” and “etics” relates to the idea that a single event can be interpreted differently. The event is etic, the interpretation is emic.