LINK TO GLOSSARY OFKEY WORDS IN BOXES PDF

LINK TO WEBSITES PDF

WORDS WITHIN A BOXED ARROW SHOW POSITIVE FEEDBACK WHICH ESCULATES THE INCREASE OF CAUSES AND THEREFORE EFFECTS

OCEANIC ACIDIFICATION

CAUSE AND EFFECT

INCREASED NEEDS FOR

FOOD

AGRICULTURE

- CLIMATE CHANGE WARMING OCEAN
- DIRRUPTS CARBON CYCLE
- SOx / NOx ACID RAIN
- CO_2
- LAND USE CHANGES
- methane
- LIVESTOCK
- CROP BURNING
- ARABLE

TRANSPORT

- CO_2
- SOx
- NOx
- CH_4
- COMBUSTION OF FOSSIL FUEL

SHELTER

- WASTE DUMPING INTO OCEAN
- CHICAL POLLUTION RUNOFFS INTO OCEAN
- RAW SEWAGE DUMPPING INTO OCEAN
- WASTE
- URBANISATION
- LESS PHOTOSYNTHESIS
- CARBON CYCLE DISRUPTION
- LAND USE CHANGES
- CARBON DIOXIDE INTO ATMOSPHERE
- DESERTIFICATION
- DEFORESTATION
- LAND CLEARANCE BY BURNING
- FEWER TREES

WATER

- WASTE DISPOSAL
- RUNOFF OF IONS
- AFFECTS PHYTOPLANKTON WHICH PHOTOSYNTHESISE
- AFFECT PHOTOSYNTHESIS
- CHEMICAL POLLUTION
- GIVE OFF CARBON DIOXIDE

HEALTH

- RECREATION
- INCREASED ACTIVITY AND LAND USE CHANGES IN ECOLOGICALLY SENSITIVE AREAS

ENERGY

- COMBUSTION OF FOSSIL FUELS
- NOx SOx SOOT
- ATMOSHERIC CARBON DIOXIDE LOADING
- LOSS OF BIODIVERSITY
- ACID RAIN
- SOIL MICROBE DESTRUCTION
- FROM BIOFUELS
- COMBUSTION
- CAUSE WAST
- CHEMMICAL POLLUTION

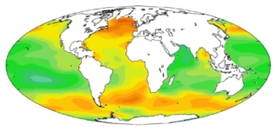
MANUFACTURE

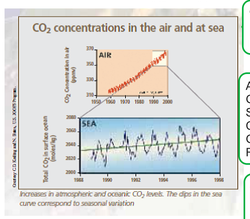
- GROWTH/PRODUCTION
- LAND SYSTEM CHANGES
- DEFORESTATION
- LOSS OFCARBON SINK
- FOR MATERIALS
- GLOBAL
- INVASIVE SPECIES
- MINING FOR MATERIALS
- LAND USE CHANGES
- pollution
- habitat loss
- FOR HEALTH
- Waste
- WASTE
- CHAMICAL POLLUTION

LARGE HUMAN POPULATION OVER CONSUMPTION

FACTS

- CARBON SINK
  - OCEAN ABSORBS 30% OF CO2 EMMITTED BY HUMAN ACTIVITY, PREVENTING EVEN BIGGER IMPACT ON CLIMATE CHANGE
- OCEANIC ACIDIFICATION
  - AS TEMPERATURES INCREASE, GASES BECOME LESS SOLUBLE IN SOLUTIONS. CARBON DIOXIDE WILL COME OUT OF THE OCEANS AS GLOABL TEMPERATURES BEGINTO RISE
  - ANY HUMAN ACTIVITY WHICH INCREASES CARBON DIOXIDE IN THE ENVIRONMENT AND THEREFORE DISRUPTS THE CARBON CYCLE

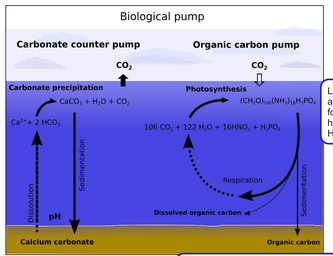




Increases in atmospheric and oceanic CO_2 levels. The dips in the sea curve correspond to seasonal variation

DEFINITIONS

- WEAKENED IMMUNITY
  - Build up of carbonic acid in the organisms produces acidosis, weakening the immune system and risking death from disease
- OCEANIC ACIDIFICATION
  - Lowering of oceans pH due to absorpbtionof Carbon dioxide gas, forming carbonic acid, which forms hydrogencarbonate ions and Hydronium ions.
- pH
  - Measurement of a solutions ability to give up hydronium ions.
- CARBON CYCLE



- DE-CALCIFICATION
  - in sea animals: ability to absorb Calcium and Carbonate ions to form the skeleton results in loss of bone structure.

EFFECT OF INCREASED OCEANIC ACIDIFICATION ON

OTHER PLANETARY BOUNDARIES

- BIODIVERSITY
  - CORAL REEFS
    - JUVENILE FISH NURSERIES
    - COASTAL DEFENCES
    - CARBON SINKS CaCO3
  - SERVICE
  - EFFECT OF DAMAGE
    - DECREASED PHOTOSYNTHESIS FROM PLANTS AND PHOTOSYNTHETIC BACTERIA AND ALGAE=INCREASE CARBON DIOXIDE
    - SPECIES EXTINCTION, FOOD WEB COLLAPSE, UNDERSIRED SPECIES DOMINATE
- CLIMATE CHANGE
  - LESS CARBON DIOXIDE BEING ABSORBED IN OCEAN
  - LESS PHOTOSYNTHESIS DUE TO ACIDIFIED
  - further increase in global temperature
  - MORE CARBON DIOXID
- LAND USE CHANGES
  - ERROSION OF SEA DEFENSE = LAND LOSS
  - ATTOL AND REEF DESTRUCTION = LAND LOSS

HUMANS

- health
  - RECREATION
    - LESS MARINE LIFE
  - LAND LOSS
    - REEFS PROVIDE COASTAL DEFENSE SO LOSS OF REEFS = ERROSION
- food
  - OCEANIC FOOD WEB COLLAPSE
  - FOOD SHORTAGES
  - MINERAL DEFICIENCIES
  - ECONOMICS
  - FISHERIES COLLAPSE

FURTHER EFFECT TO OCEANIC ACIDIFICATION

- MORE CARBON DIOXIDE RELEASED=MORE ACIDIFICATION
- UNDERSWIRABLE STATE WITH DIFFERENT ORGANISMS

CAUSES LEADING TO INCREASE IN OCEANIC ACIDIFICATION

SOLUTIONS

- ATMOSPHERIC INCREASE IN CARBON DIOXIDE
  - HYDRONIUM IONS FORM FROM CARBONIC ACID IN WATER
  - INCREASED pH IN OCEAN
- CHEMICAL POLLUTION
  - LOSS OF BIODIVERSITY
  - EUTROPHICATION
    - CO2 RELEASED
    - LESS PHOTOSYNTHESIS
    - MORE CARBON DIOXIDE RELEASED
  - MICROBES AND PHYTOPLANKTON WEAKENED
- LOSS OF BIODIVERSITY
  - CHANGE IN FOOD WEBS
    - DECALCIFICATION OF MARINE LIFE
  - INCREASED pH LEADS TO
    - LOWERED IMMUNE SYSTEMS
    - CORAL BLEECHING
- GREENHOUSE GASES
  - ABSORPTION OF GASES LEADS TO ACIDIFICATION
- LAND USE CHANGE
  - LESS PHOTOSYNTHESIS, LESS CARBON SINKS, MORE CARBON DIOXIDE
  - INSTEAD OF ABSORBING CARBON DIOXID THE CHANGE MAY MEAN PRODUCTION OF CARBON DIOXIDE e.g. farming