

Case Study: The Aral Sea



The Shrinking Sea



Aral Sea in 2000



Aral Sea in 2009

*Black line signifies 1960 water levels

Causes

- In 1950s the Soviet Union diverted two main rivers for use of irrigation in Kazakhstan
 - Cultivation of Cotton and Wheat
- Created 20,000 miles of canals and 80 reservoirs



Impacts: Water Levels

- Initially water levels dropped by 21 cm/yr, as climate shifted water loss increased to 52 cm/yr
 - Smaller amounts of water leading to sun having more impact on less water leading to higher rates of evaporation



Impacts: Salinity

- Although officially classified as a freshwater lake due to water loss the concentration of salt has risen from 10 g/l to 100 g/l
 - Making lake unlivable for most fish
 - Commercial fishing disappeared
 - 43,430 tons of fish harvested in 1960 to zero in 1980



Kazakstan's dried-up Aral Sea, September 1996.

Impacts: Salinity of Soil

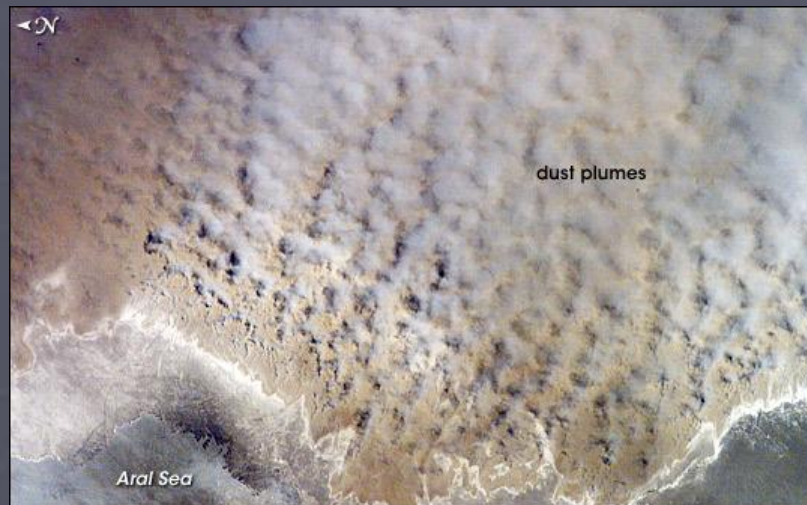
- Water used from Aral sea to water crops of nearby farms leads to eventual destruction of farm land
 - Increasingly salty water used to farm land, water evaporates but salt is left behind, salt makes land less productive

Impacts: Drying of Groundwater

- Salinity dries up soil and subsoil making it hard, which prevents the absorption of water and filtration into groundwater aquifers
 - Easier soil erosion
 - Increased use of fertilizer and chemicals to increase productivity

Impacts: Desertification

- Land in Aral sea area has become unusable
 - Combination of lack of water and Salinity
- Loss of top soil leading to inability to grow plant
 - Loose topsoil blown away to create huge dust storms



Reform

- 1990s decision was made to dam river from flowing to south Aral Sea to save North Aral Sea
- Kazakhstan is working with the World Bank to take out loans for projects to increase water flow into South Aral Sea
 - With some success but cyclical dryness