

Aral Sea Affairs



Michael H. Glantz
Senior Scientist, Director
Center for Capacity Building
National Center for Atmospheric Research
Boulder, Colorado USA
glantz@ucar.edu

Aral Sea



Aral Sea Affairs: components

- **Aral Sea science**
- **Aral Sea impacts**
- **Aral Sea policy & law**
- **Aral Sea politics**
- **Aral Sea economics**
- **Aral Sea ethics**

Aral Science

- The science of the Aral basin is quite easy to understand, as complex as its components and their interactions might be
- The hydrologic balance has been disrupted by human activities
- More water is leaving the system's water collector (the Aral Sea) than is going into it.
- This is a process that has been intensified since 1960 (a key turning point for the sea)

The Aral Sea becomes the Aralkum



Glantz photo, 1995. Karakalpak fishing village



The Aral Sea Setting

- The Aral is really a lake by definition of its characteristics
- It is fed primarily by Central Asia's two major rivers, Amu Darya and Syr Darya
- It has varied in level over its 35 thousand year history (recent times)
- Its level in 1960 was about 53 m above mean sea level
- Its salinity was about 4 percent
- It had several endemic species of fish & wildlife

Aral Political Setting

- The region fell under Soviet control in the mid 1920s, until 1991 when the USSR fell apart
- Borders were rather arbitrarily drawn
- Climate is excellent for widespread cotton production
 - **Adequate sunlight; fertile sands; irrigation water; engineering skills; political determinism from Moscow's Politburo**
- The sea was seen since 1908 (tsarist times) as a useless body of water in a water-short desert setting
- Tzinzerling created a scenario for the levels of the sea for various levels of water withdrawals from the rivers. His work was ignored
 - **His scenarios proved to be quite accurate**

Cotton was (and is) king in Soviet Central Asia



Turkmen postage, 1933; cotton



Uzbek stamp, 1957. cotton



Cotton factory, 1999. Uzbekistan

Aral Impacts on ecology and society

- **On ecology**
 - Rich flora and fauna
 - Rich delta environment (terrestrial and aquatic)
 - Rich stream ecology
 - Steady upstream water supply from seasonal glacier melt
- **On society**
 - Abundance of river water and sea level
 - Fertile but dry soils
 - Productive environment for settlements and livelihoods
 - Sustainable balance of its regional water cycle

Societal Impacts on the Aral

- **Streamflow diversions** (rob the sea of water)
- **Karakum Canal diversion from Amu darya**
- **Drying out and recession of the circum-Aral shoreline**
- **Major loss of flora and fauna** (land and lake)
- **Drying out of the delta**
- **Increase in lake salinity** (like open ocean now)
- **decrease in biodiversity**
- **Loss of wetlands**
- **Etc.**



July - September, 1989

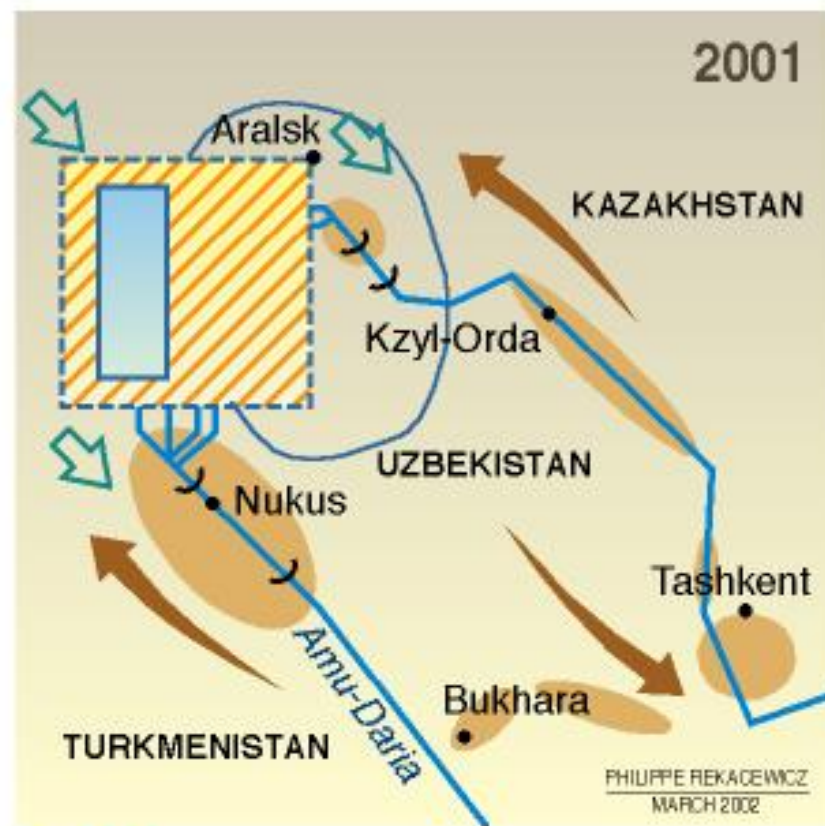


August 12, 2003


From a UN FAO report, 1997

- **Key farming blunders in the Aral Basin**
- Discharge of highly mineralized, pesticide-rich return flows into main rivers
- Use of unlined irrigation canals leads to waste and seepage of salts into groundwater
- Waterlogged fields lead to salty groundwater and salt runoff
- No drainage network to remove unwanted water and chemicals from the fields
- www.fao.org/NEWS/1997/970104-e.htm

The Shrinking of the Aral Sea: Socio-Economic Impacts



-  Fishing zone
-  Food crops, partly irrigated
-  Fish exports

-  Dry zone and unusable areas (salination)
-  Cotton and rice, widely irrigated
-  Dam
-  Fish imports
-  Cotton and rice exports

Source: Philippe Rekacewicz, *An Assassinated Sea*, in *Histoire-Géographie, initiation économique*, page 333, Classe de Troisième, Hatier, Paris, 1993 (data updated in 2002); *L'état du Monde*, 1992 and 2001 editions, La Découverte, Paris.

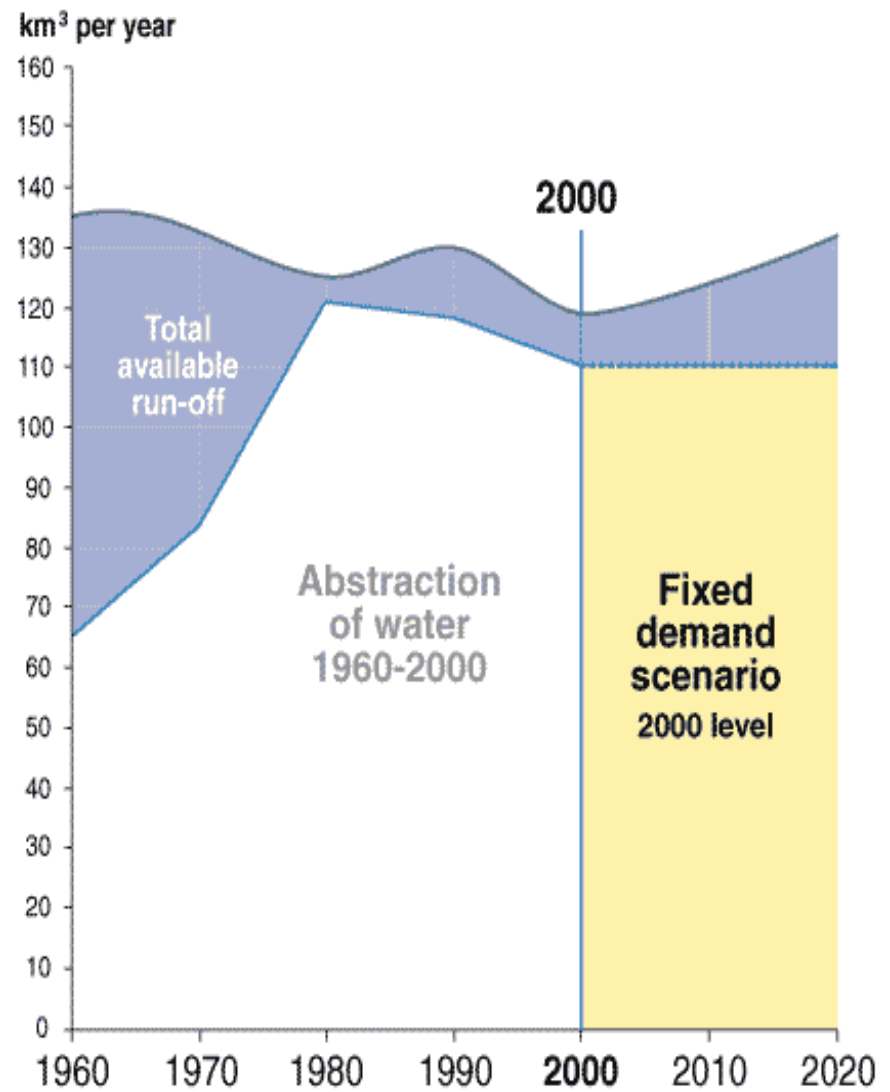
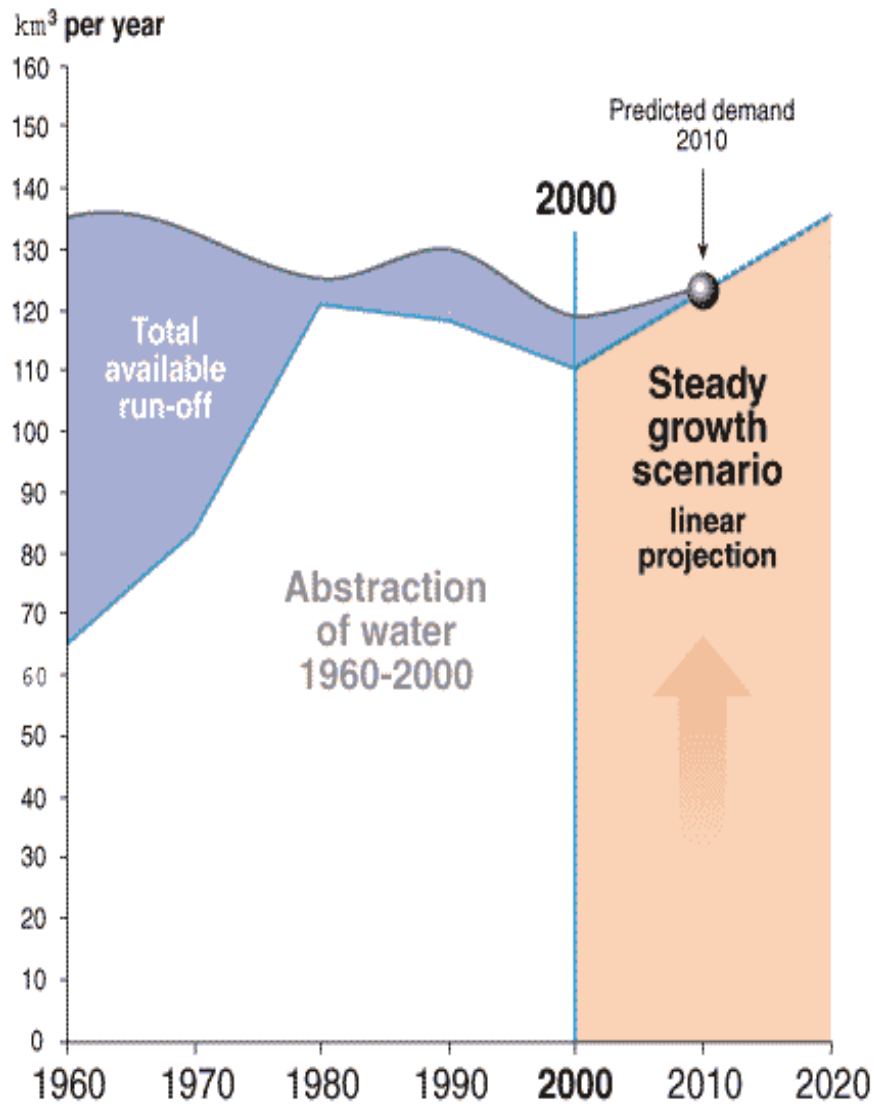
Creeping Environmental Problems and Sustainable Development in the Aral Sea Basin

Edited by **Michael H. Glantz**



Aral Policy & Law

- **Soviet period**
- **Politburo Decisions**
 - to expand cotton production
 - to construct Karakum Canal
 - to let the sea level decline
- **Cost benefit done for Aral sea water**
 - Value of use of water for fish or for cotton
- **Post-Soviet period**
- **Continued dependence on cotton production, despite efforts to use water more efficiently**
- **Increases in the amount of water diversions**
- **Grow rice**
- **Presidential Interstate declarations to fix the Aral crisis**
- **National policies compete for water**
- **Inter-state conflict over water amounts and releases**
- **Upstream-downstream conflicts increase**
- **Afghanistan seeks to increase diversion from the Amu Darya**



Aral Basin Politics

- **Interstate rivalries and ethnic rivalries**
- **Upstream vs. downstream states**
- **Disproportionate diversion to the Karakum Canal by Turkmenistan**
- **Water for cotton vs. other uses**
- **Afghanistan joins the former Central Asian republics**
- **Authoritarian governments**
- **Reduce diversions to refill the sea at some level**
- **Kazakhstan to save the Little Aral (in the north)**

Aral Economics

- Breakup of USSR into 5 separate economies; increase in regional rivalries
 - Kyrgyzstan vs. Uzbekistan, water for irrigation vs. heating
- Uzbekistan economy dependent on cotton production
- Turkmenistan economy dependent on canal diversions
- Loss of commercial fisheries
- Saving the Amu darya delta to regain its productivity

Cotton production requires water, fertilizers, pesticides



Aral Ethics & Equity

- Upstream vs. downstream users
- Treatment of the Karakalpak people
- Who speaks on behalf of nature? The deltas? or Fish? or the Sea? or Minorities? or the people at risk to adverse health impacts?
- Water sharing: should it be based on per capita? On historical use levels?
- The former Soviet republics are really part of a Greater Central Asia Afghanistan is 17 percent of the Aral Basin what proportion of water should go to Afghanistan?

Concluding comments

- US Vice President Gore called the Aral crisis the worst human made environmental disaster of the 20th century
- The Aral Sea crisis is an example of a creeping environmental problem
 - It developed over 60 years !
- Short term economic gain often wins out over longer term environmental degradation
 - 1cu. m of water on sands is worth 100 times more than keeping a fish alive (a Soviet researcher's calculation)
- **AND ... now there is Lake Chad in Africa**

The Peace Bridge Initiative, 2003-04

Michael H. Glantz
Senior Scientist
NCAR

DRAFT of thoughts
July 16, 2003

Capacity Building by Proxy: development in real time

- **What? The idea of capacity building by proxy is to build human educational capacity in climate- and water-related issues**
- **Who? The goal is to use local expertise in developing countries to educate and train others in the region**
- **Why? It is a direct approach to developing human capacity in a lesser developed region using the experience and expertise already in place in a relatively more developed country**
- **Where? A prototype activity for capacity building by proxy will be undertaken between Uzbekistan and Afghanistan**
- **When? To begin in August 2003 and end in September 2004**

Capacity building by proxy along the Afghan-Uzbek border

- How?

The Amudarya forms the border between Afghanistan and Uzbekistan

- **The Peace Bridge at Termez, Uzbekistan crosses the Amudarya**
 - **The Peace Bridge is the symbol for this activity; one must build a bridge from two sides**
- **Termez State University is 70 km from Mazar I Sharif, in northern Afghanistan**
- **The vicechancellor of Termez State University proposed working with those counterparts in northern Afghanistan on water- and climate-related issues including water and air pollution**
- **The idea to work cross-border was the vice chancellor's**
- **I then proposed using Uzbekistan human capacity to help build similar capacity in northern Afghanistan**
- **We can provide some guidance, funding and direct support to the Uzbek counterparts who can follow a capacity building plan for Afghanistan**

Capacity building partnerships

- **Who?**
- **Dr. Rashin Kulmatov, Vice Rector, Termez State University, Termez, Uzbekistan**
- **Professor (TBD), Mazar I Sharif University, Afghanistan**
- **Dr. Michael H. Glantz, NCAR, Boulder, Colorado**
- **Dr. Zafar Adeel, UNU Water, Environment and Health Center, McMaster University, Hamilton, Ontario, Canada**
- **Dr. Y. Shadimetov, ECOSAN Director, Uzbekistan (he opened a branch of ECOSAN in Balkh University in northern Afghanistan)**
- **Others in Uzbekistan, Afghanistan, UN organizations and elsewhere**