

Leroy Sievers and Ann Bleed

Western States Land
Commissioners Association
Summer Conference, 2013



Sustaining the Beneficial Use of Water:



Do We Really Care About our Grandchildren?



Zain and Gabe on First
Day of School in
Australia



Claire on Second Birthday



Nebraska Agriculture

Sandhills Grazing Land



Photo by Chris Helzer

Little Blue Stem in Sand Hills Prairie



Photo by Chris Helzer

Nebraska's Platte River



Niobrara River



Photo by Chris Helzer

Hunting in Eastern Nebraska



Photo by Chris Helzer

Grazing and Crop Land near Wildcat Hills, Western Nebraska



Photo by Chris Helzer



Sustainability

Living and developing our economy in
such a way

“that we meet the needs of the
present without compromising the
ability of future generations to meet
their own needs.”

Brundtland Commission, United Nations 1987

Does Intergenerational Equity Matter



Sustainability

"sustainability is improving the quality of human life while living within the carrying capacity of supporting ecosystems."

2005 World Summit on Social Development

The earth's resources are limited!

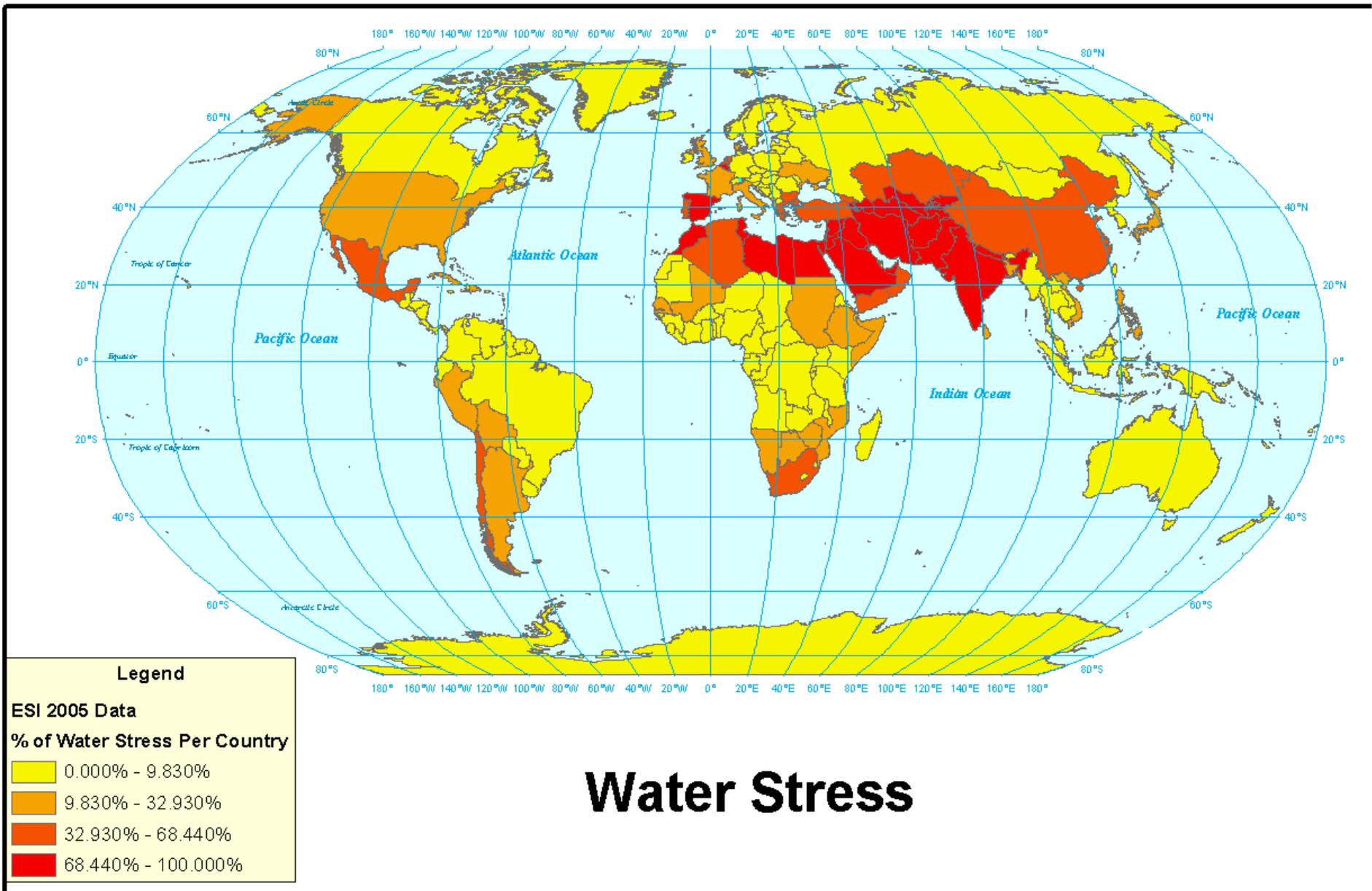


2.3 billion more people by 2050

**By 2050 we will need to
double food production**

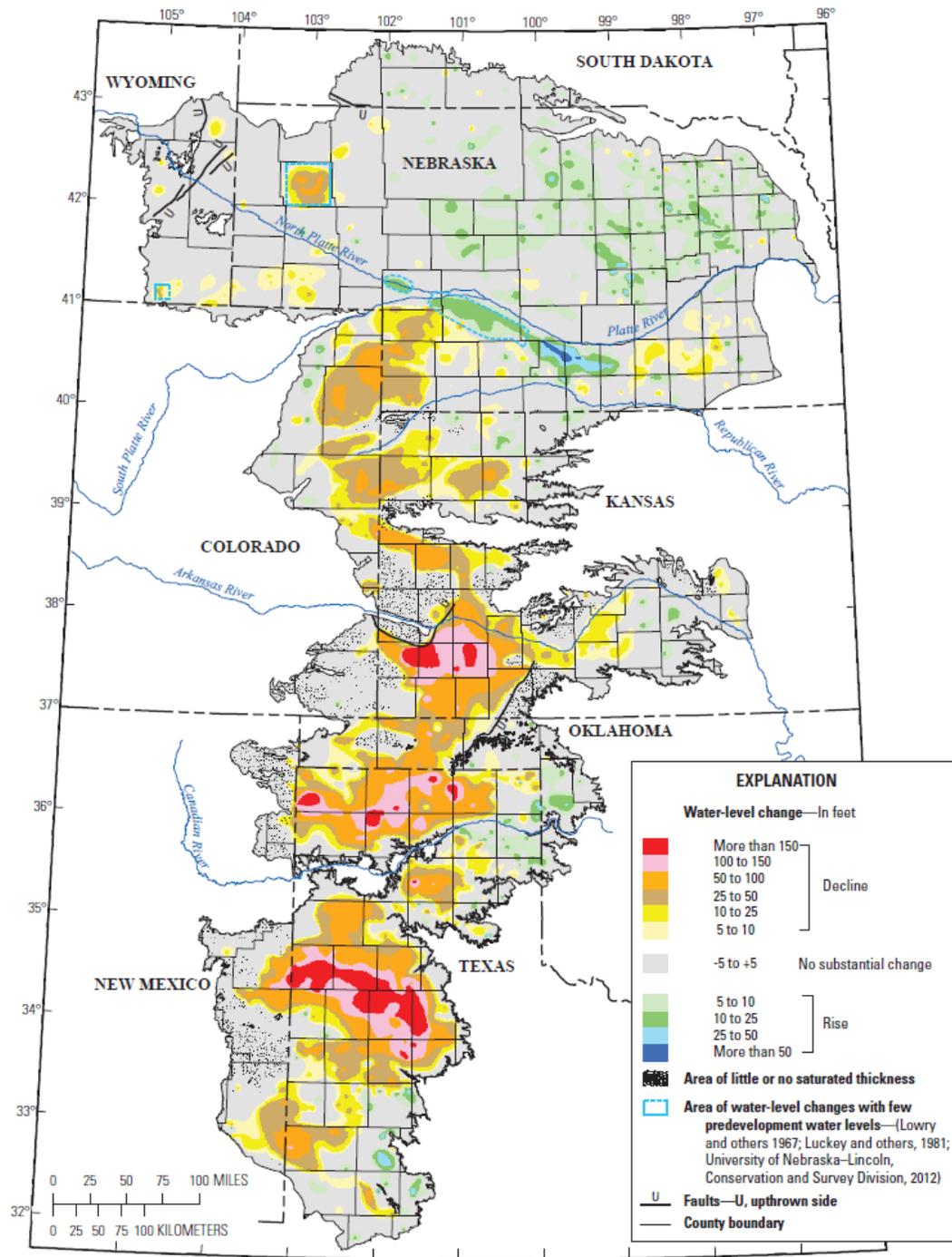
Loss of Arable Land and Pollution





Water-level Changes in the High Plains Aquifer, Predevelopment to 2011

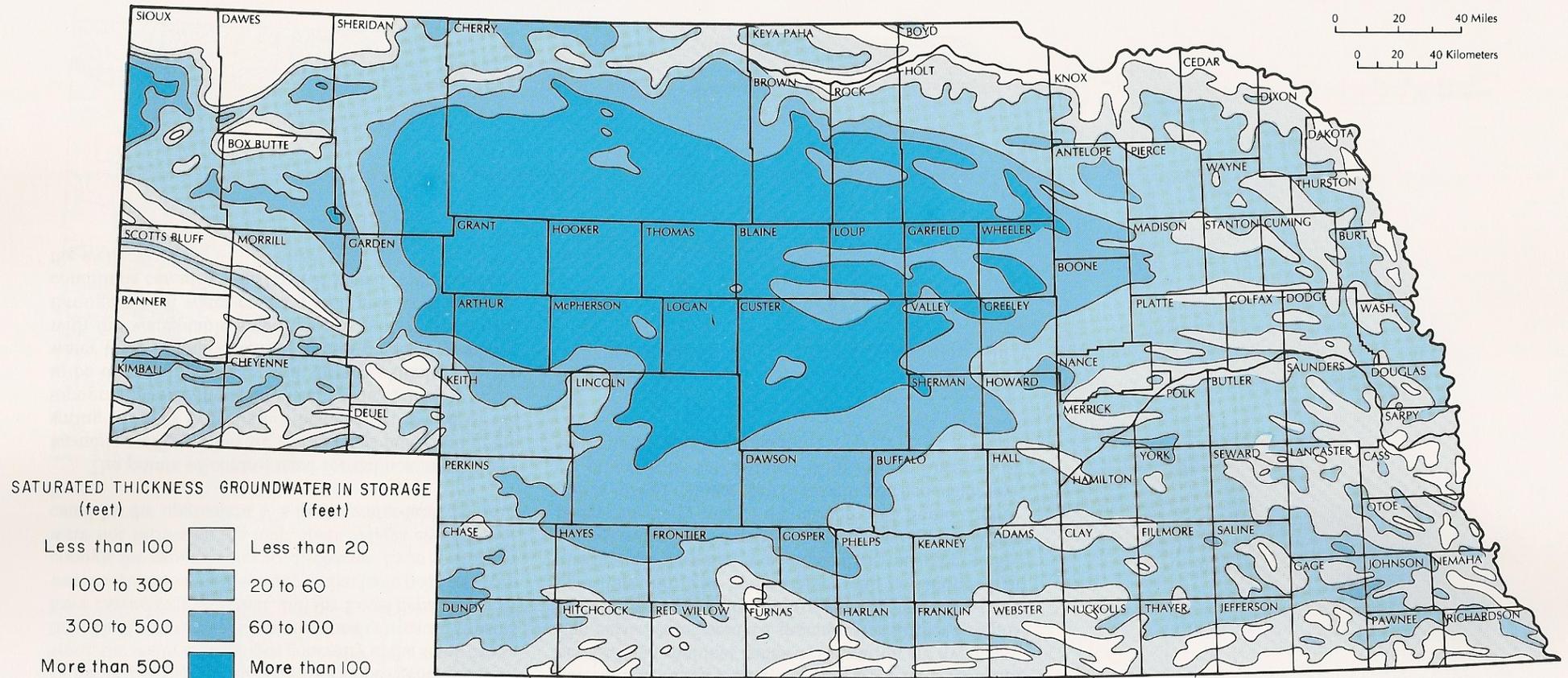
V.L. McGuire
 USGS Scientific
 Investigations Report
 2012 - 5291



Base from U.S. Geological Survey digital data, 2001, 1:2,000,000.

Aquifer boundaries from USGS (2010), *Atlas of the High Plains Aquifer*.

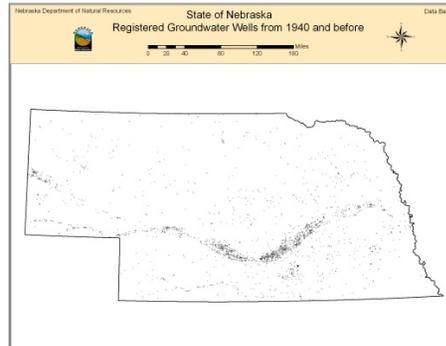
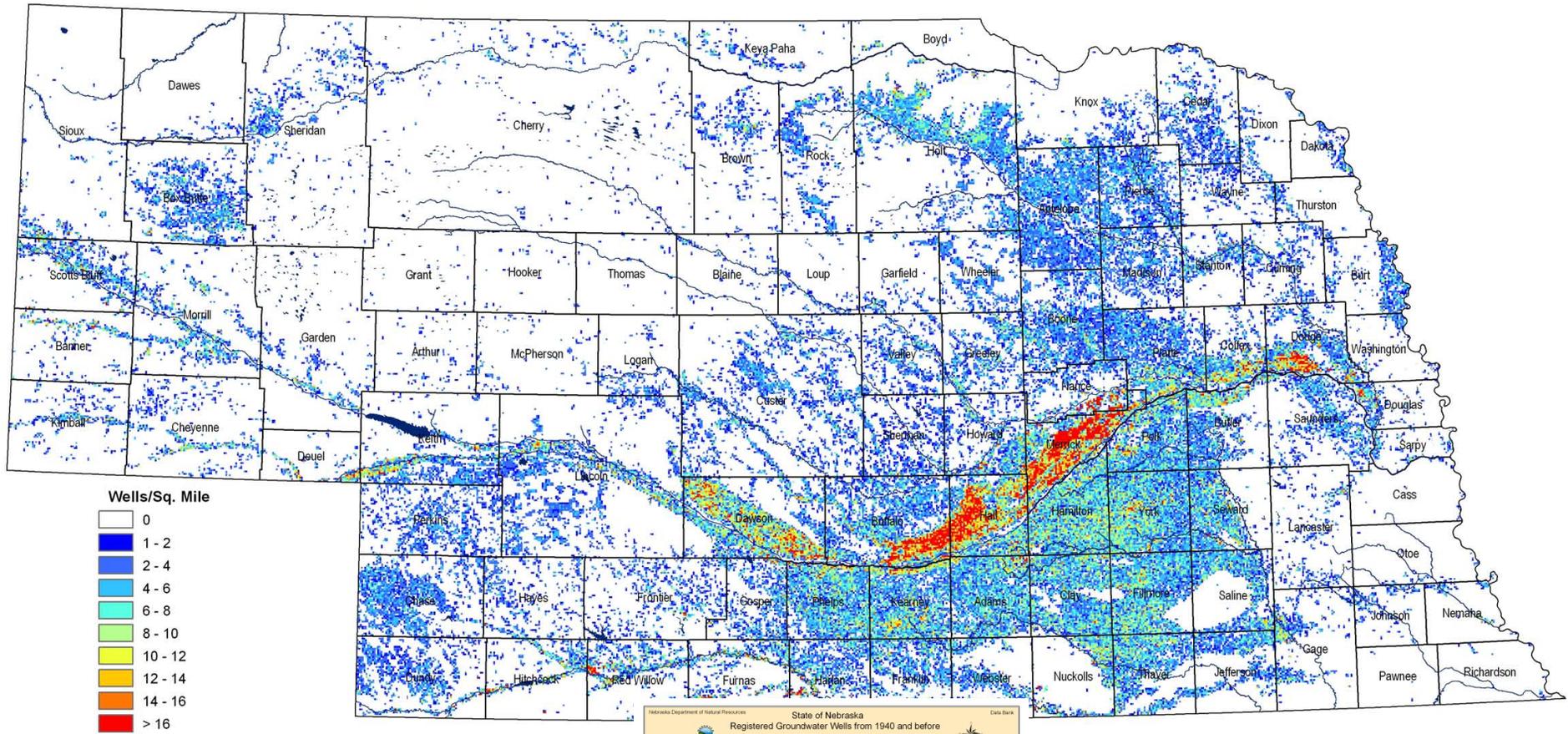
Figure 11



White areas indicate principal groundwater reservoir very thin or absent

Saturated Thickness of the Principal Groundwater Reservoir

Density of Registered Irrigation Wells in Nebraska

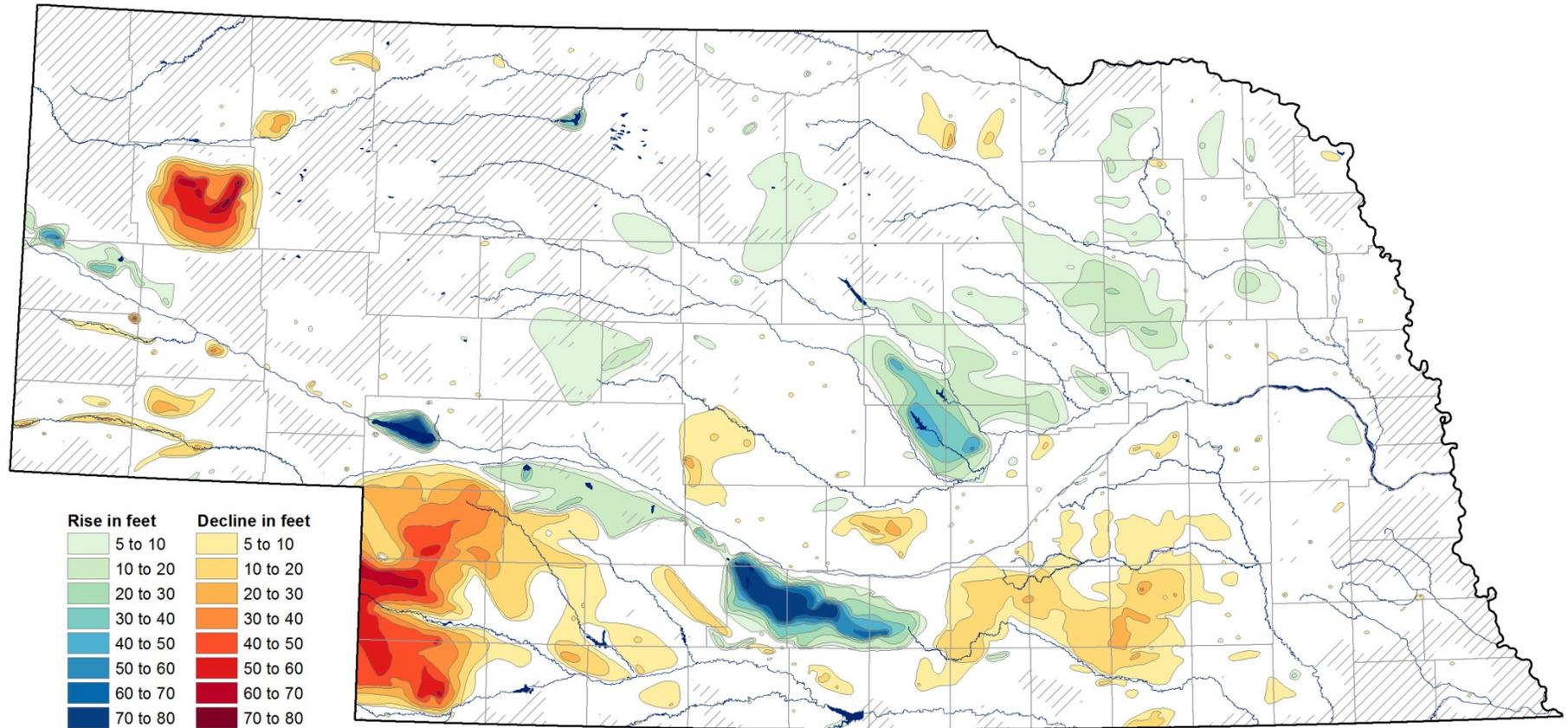


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Mark Burbach, Water Levels Coordinator, CSD

Groundwater-level Changes in Nebraska - Predevelopment to Spring 2012



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 Jesse Korus, Survey Geologist, CSD

U.S. Geological Survey
 Nebraska Water Science Center

U.S. Bureau of Reclamation
 Kansas-Nebraska Area Office

Nebraska Natural Resources Districts

Central Nebraska Public Power and Irrigation District


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December 2012

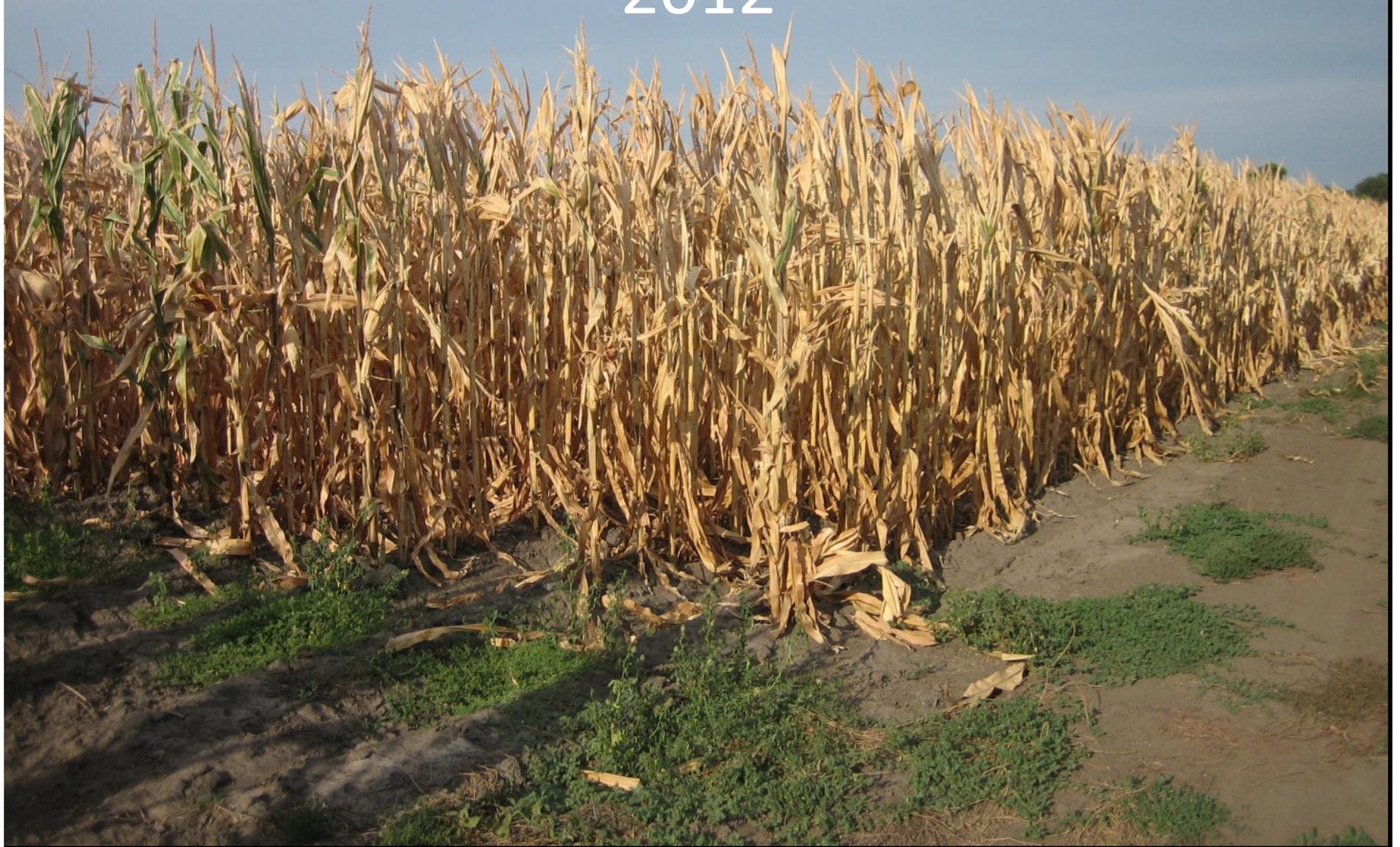


Photo by Cindy

Flooding on the Missouri River 2011



Dry-land Corn in Eastern Nebraska 2012



Summer in Nebraska 2006





Thousands of Acres Burn in Niobrara River Valley

Photo by ADAM WOLFFBRANDT/Lincoln Journal Sta

A raging weekend wildfire along the Niobrara River valley burned an estimated 150 square miles of forest and grassland and forced the evacuation of a pair of small towns and several river outfitters.

Burned Prairie on Niobrara River 2012



Copyright Chris Helzer/The Nature Conservancy

**Prairie grasses such as sand bluestem
growing well across the bison pasture
during the first growing season since
last July's wildfire.**



Copyright Chris Helzer/The Nature Conservancy

Flower species such as cutleaf ironplant (left) and spiderwort (right) are coloring the sandhills in the burned bison pasture (NVP 2013)

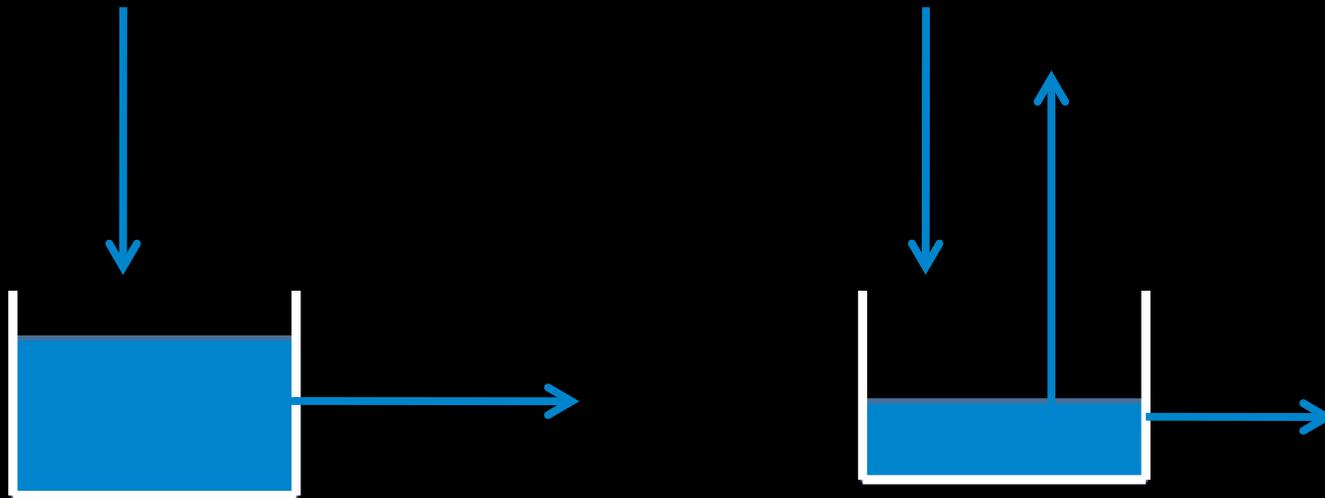


Hydrology 101 for Land Managers

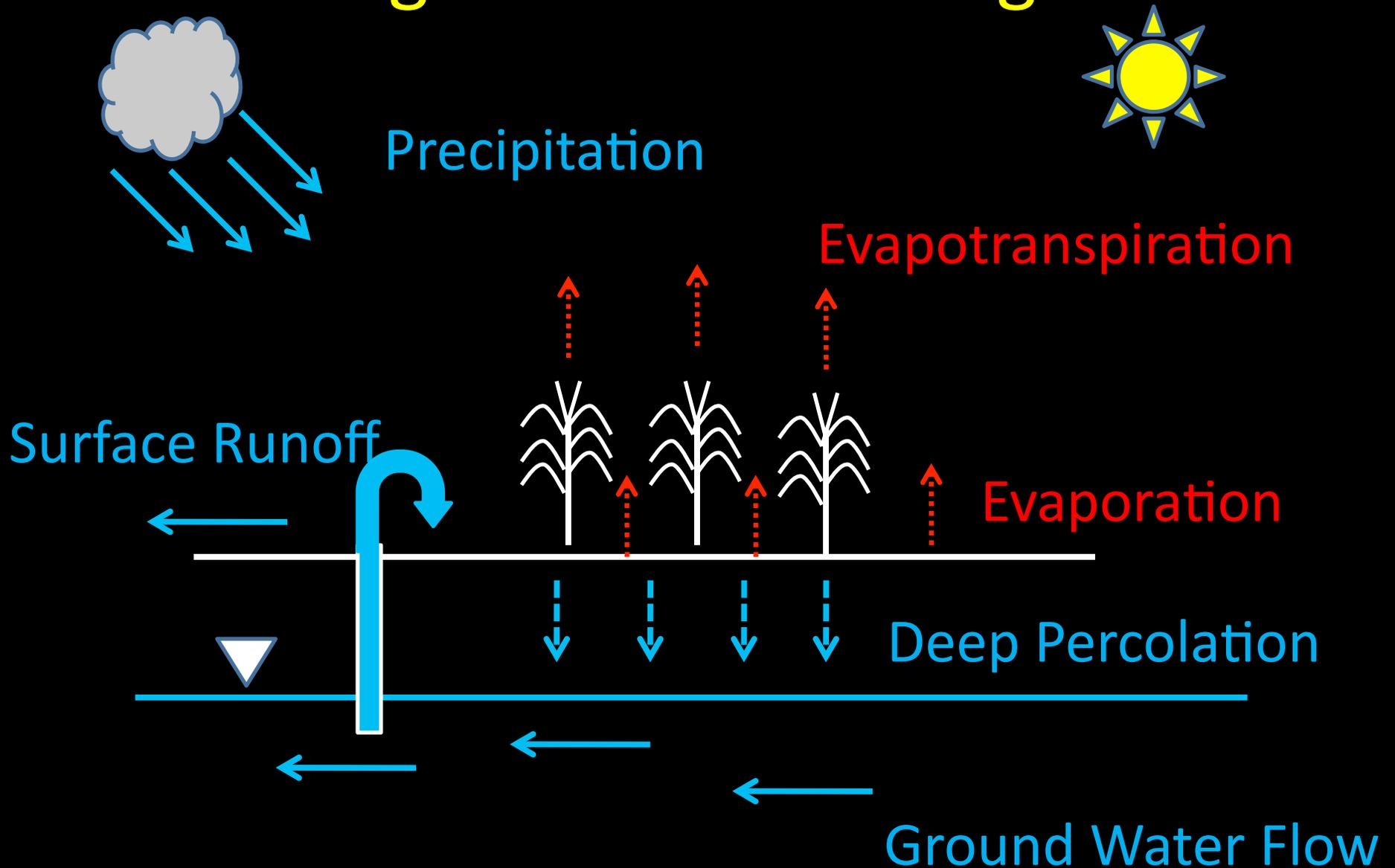
The No-Injury Standard

Continuity Equation

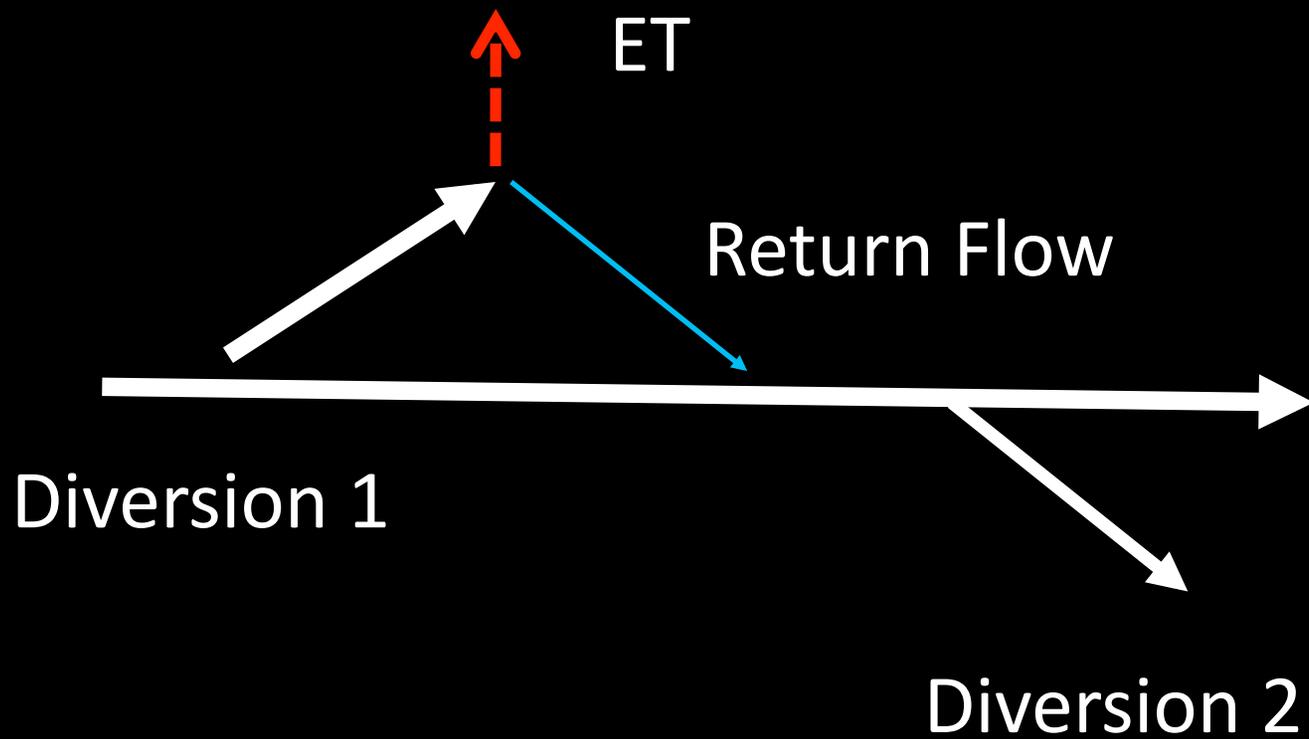
Inflow = Outflow + Change in Storage



Irrigation Water Budget



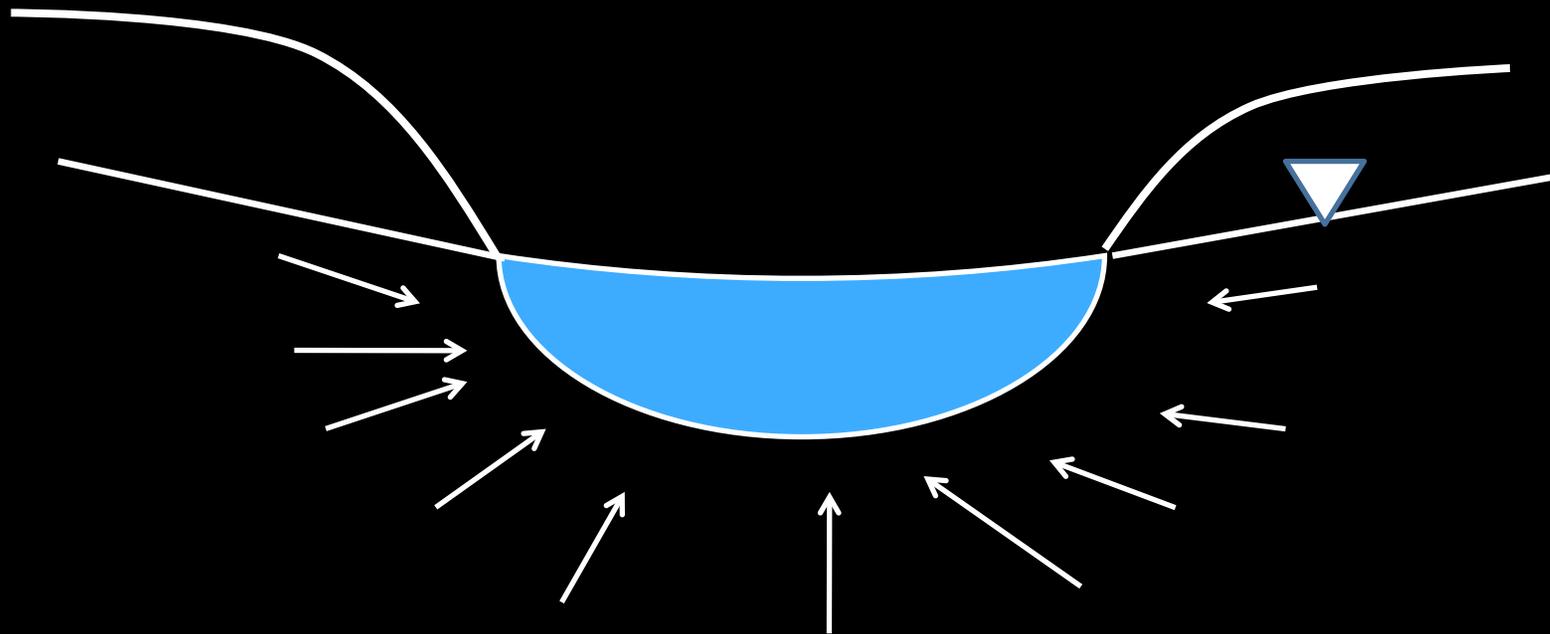
Change in Return Flows



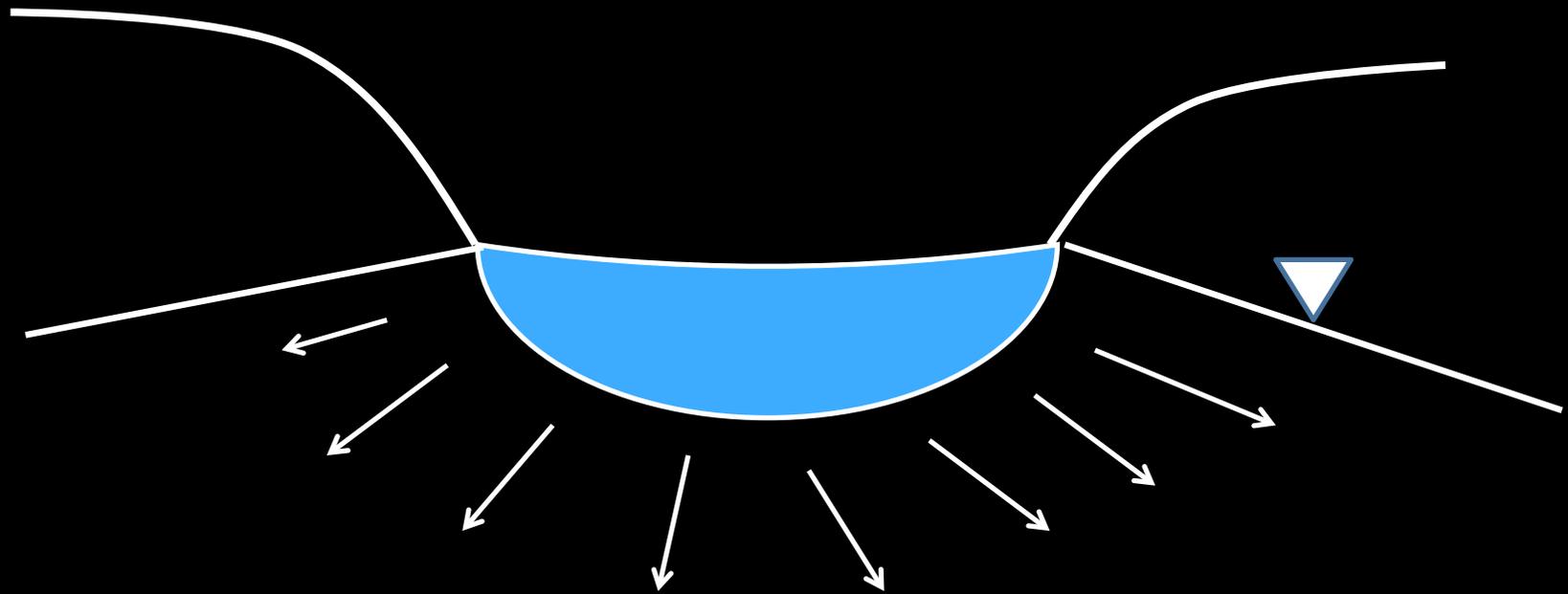


Platte River June 2006

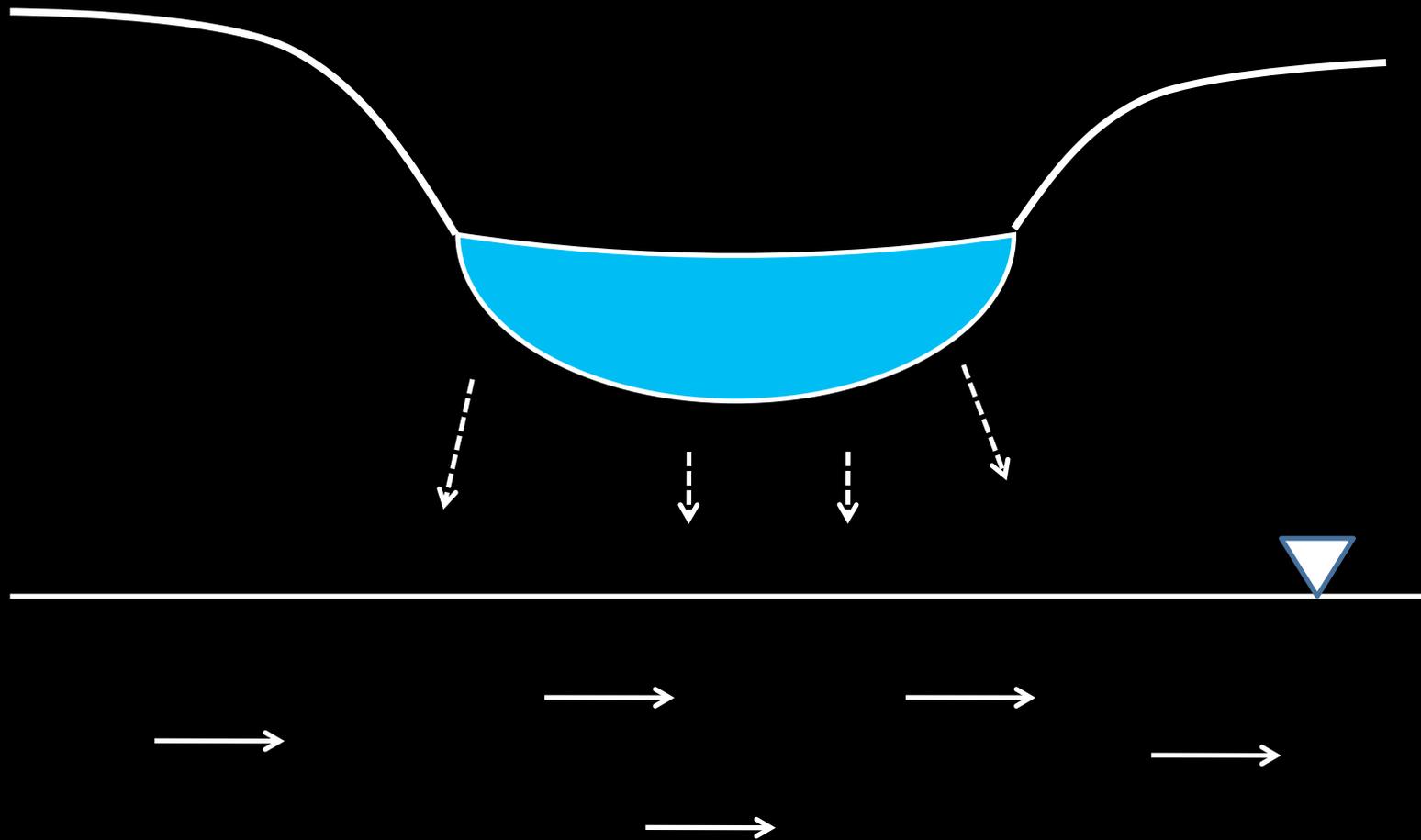
Gaining Stream



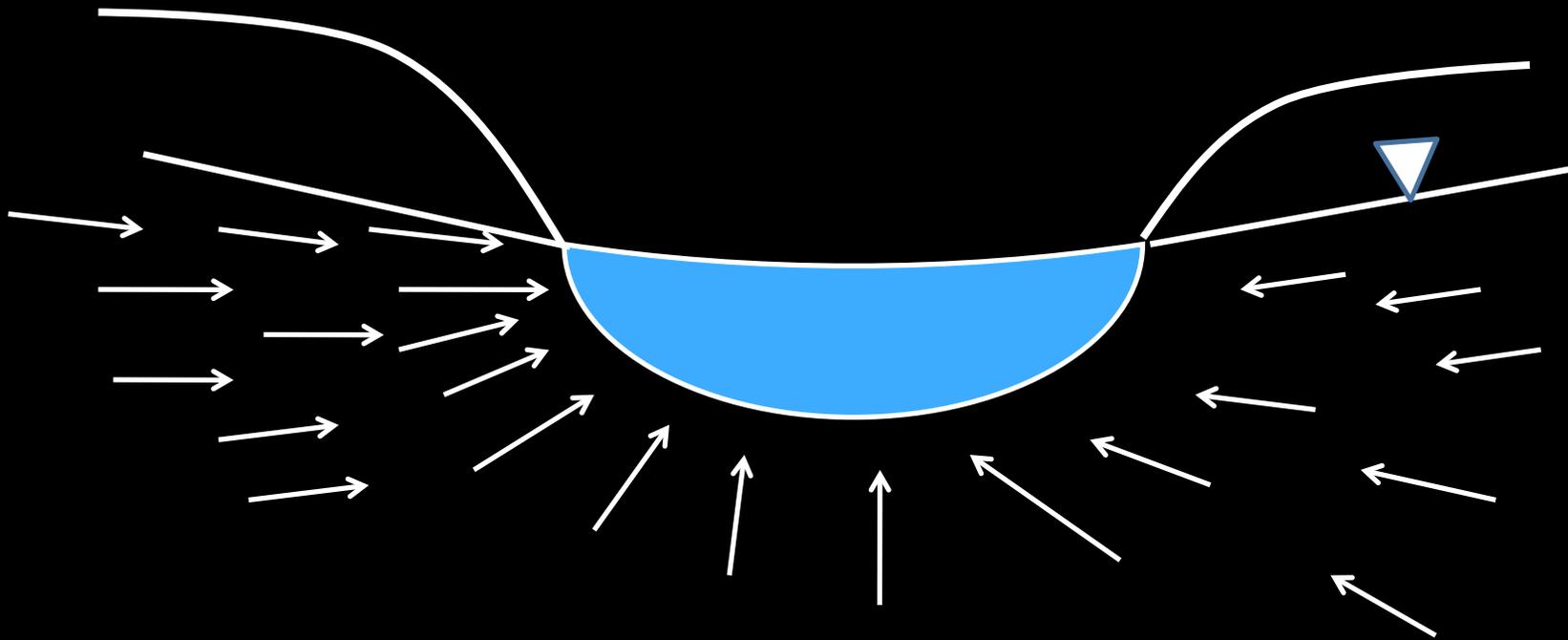
Losing Stream



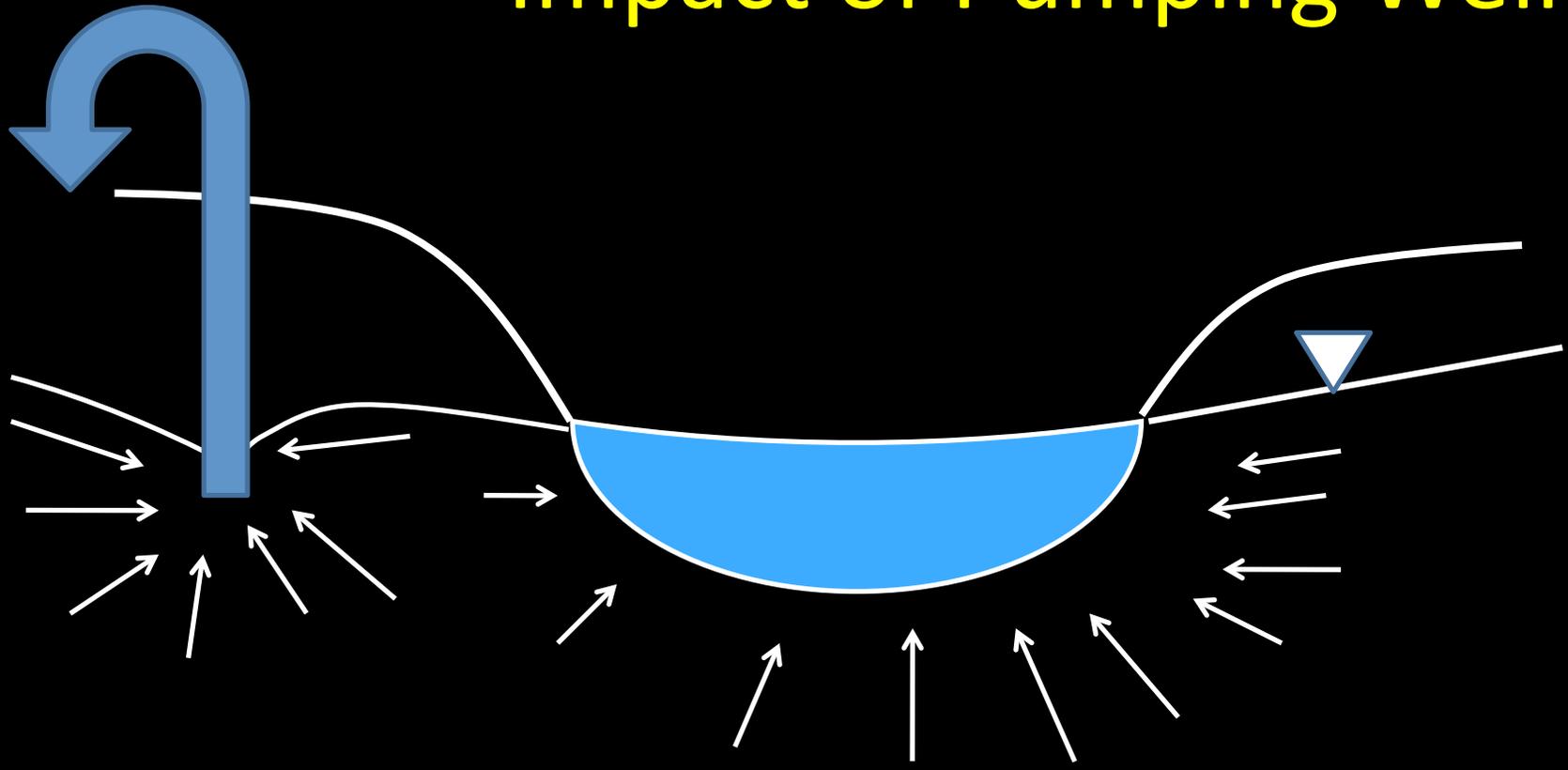
Disconnected Stream



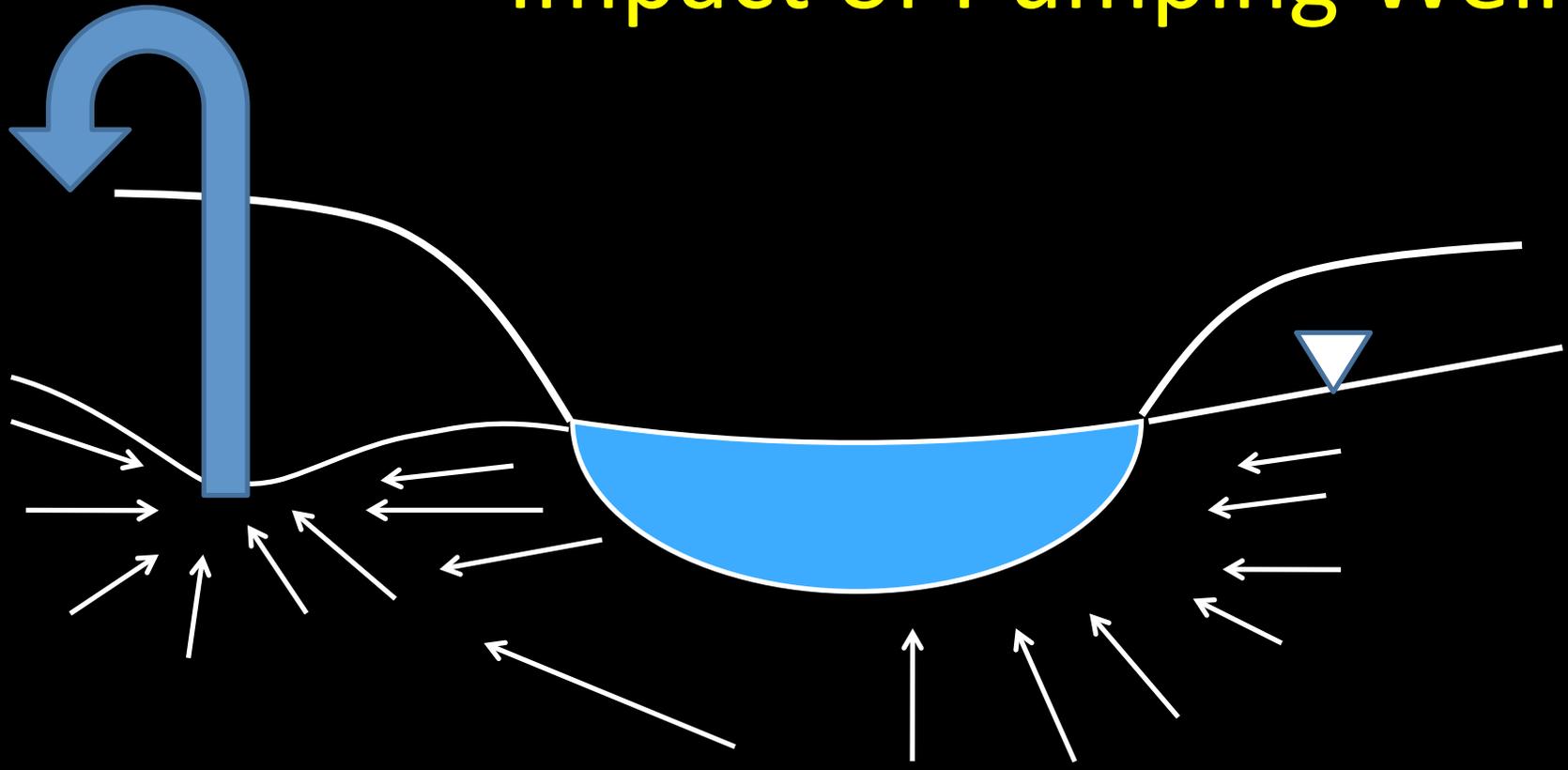
Gaining Stream



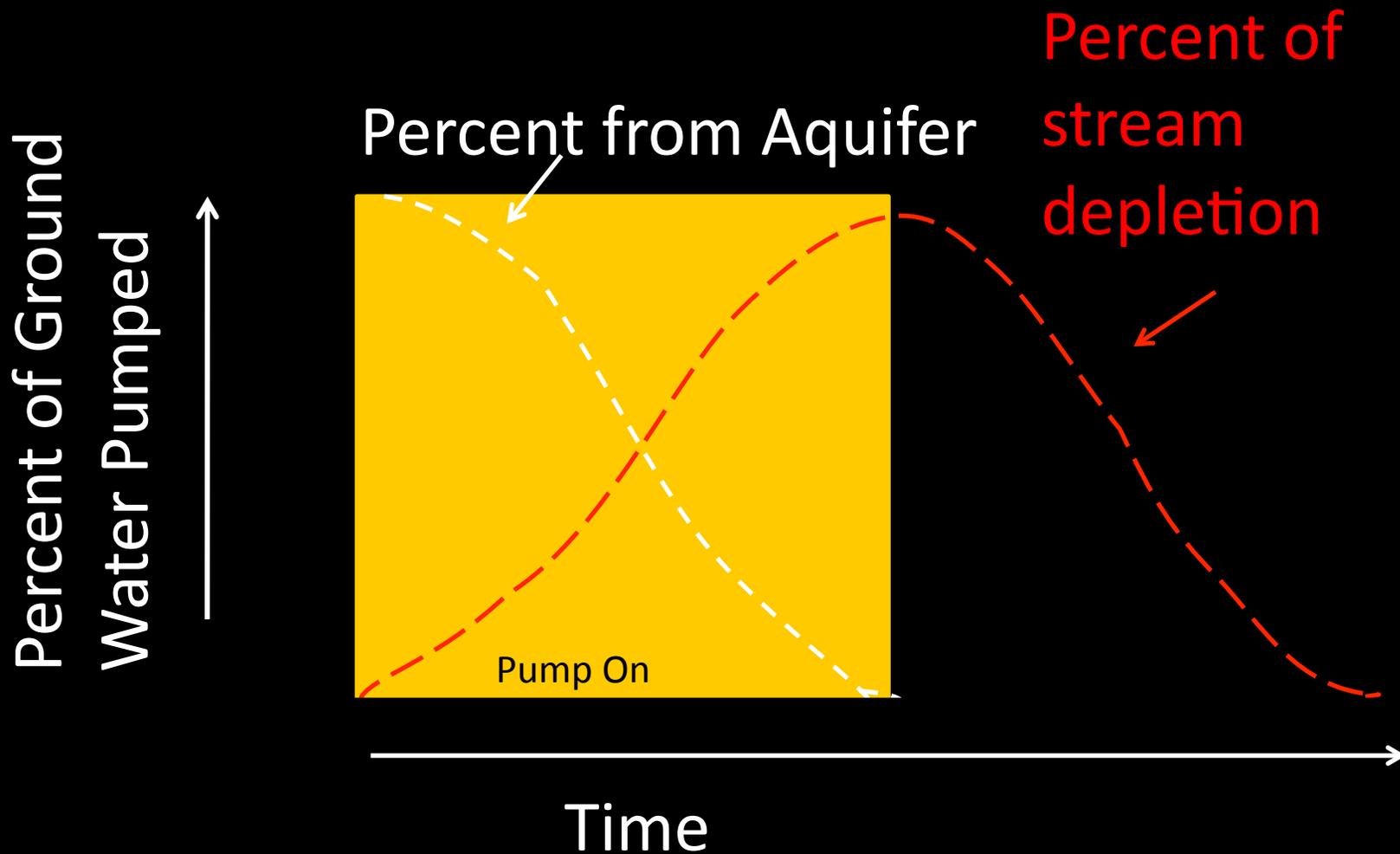
Impact of Pumping Well

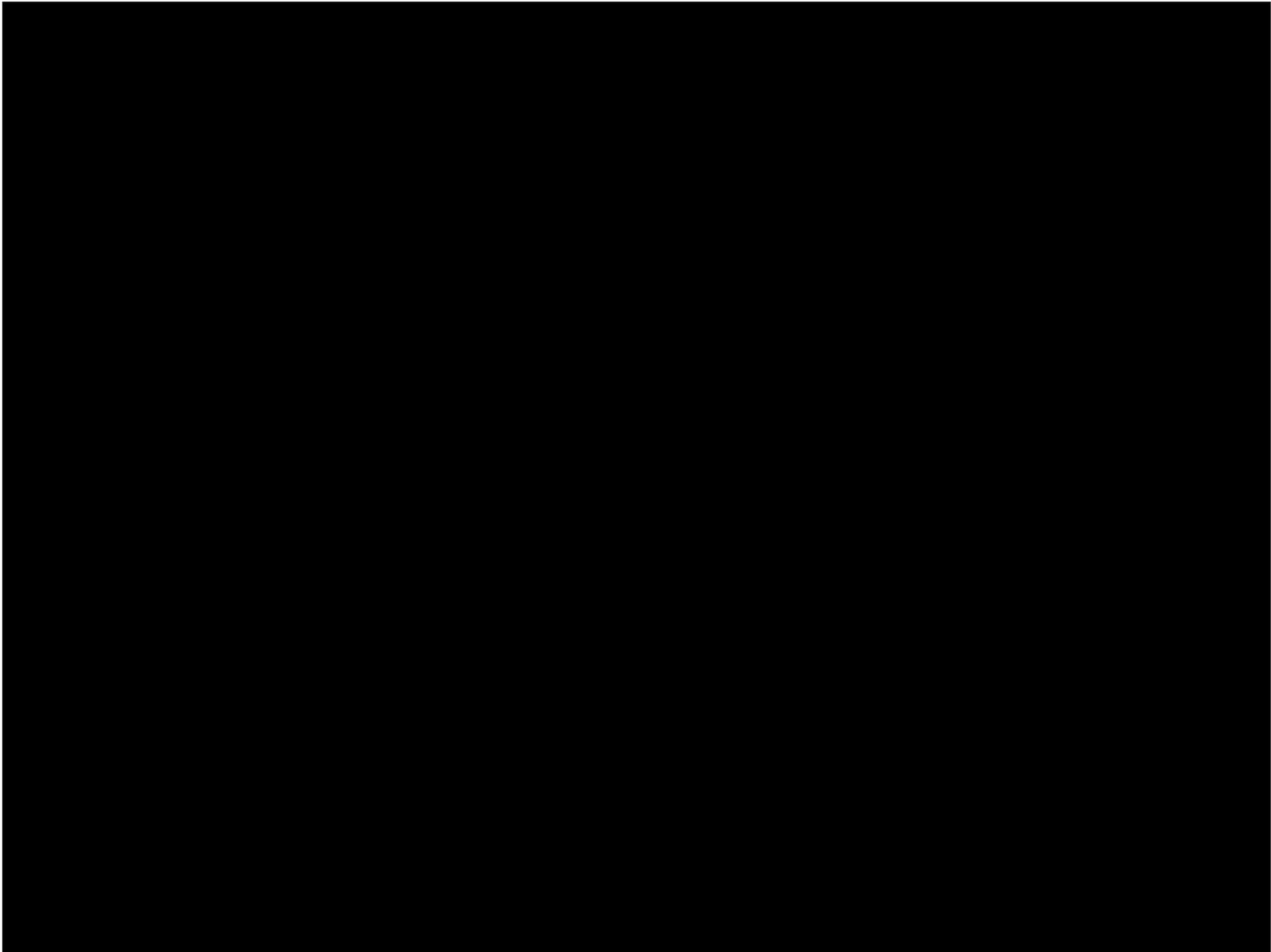


Impact of Pumping Well



Source of Water to Pumping Well

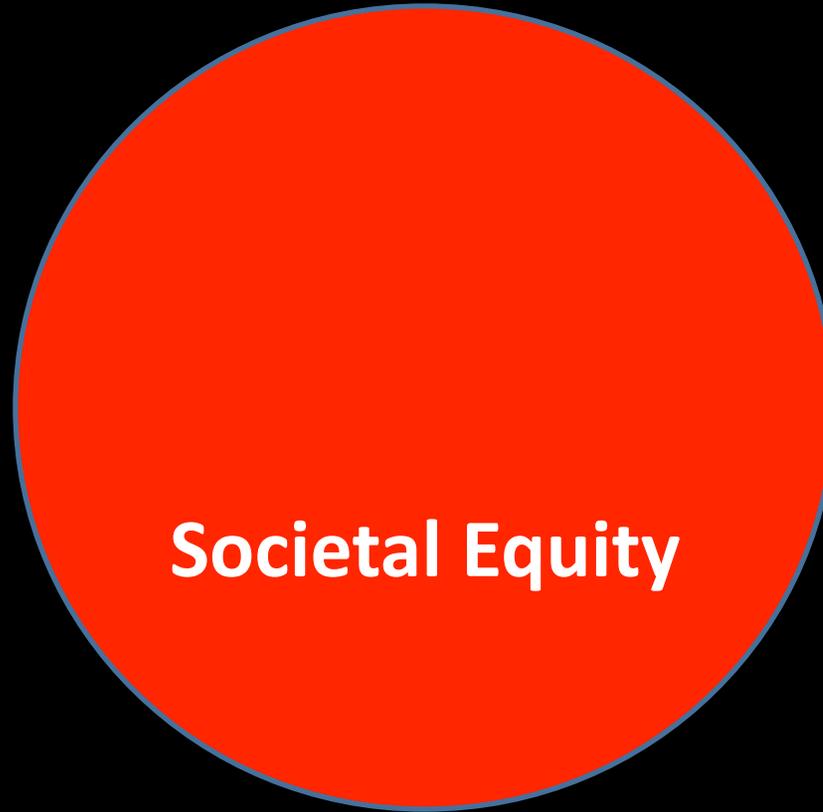






**Economic
Demands**

Intergenerational Equity





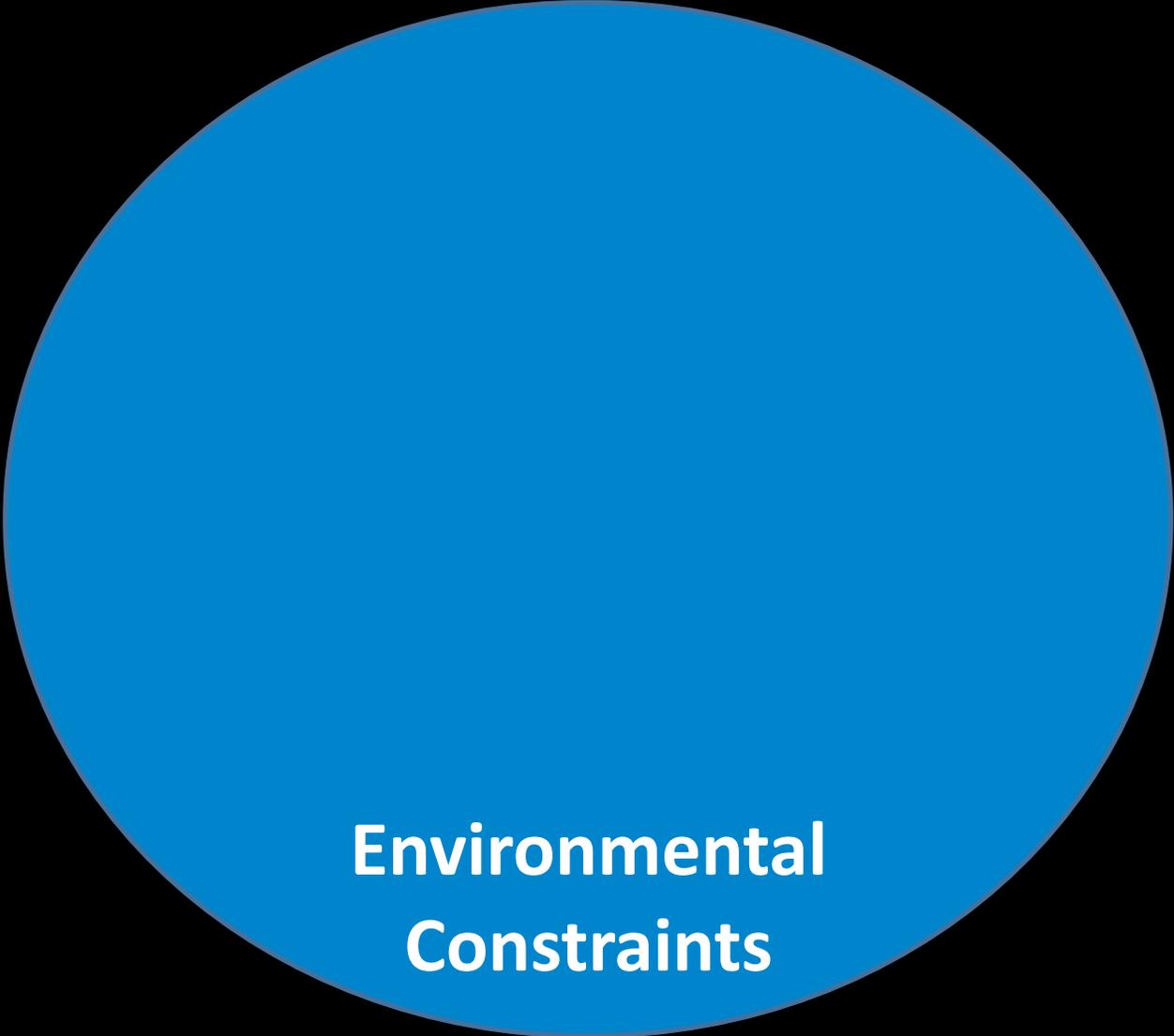
ELINOR OSTROM

2009 Nobel Laureate
in Economic Sciences

Nobel medal © © The Nobel Foundation



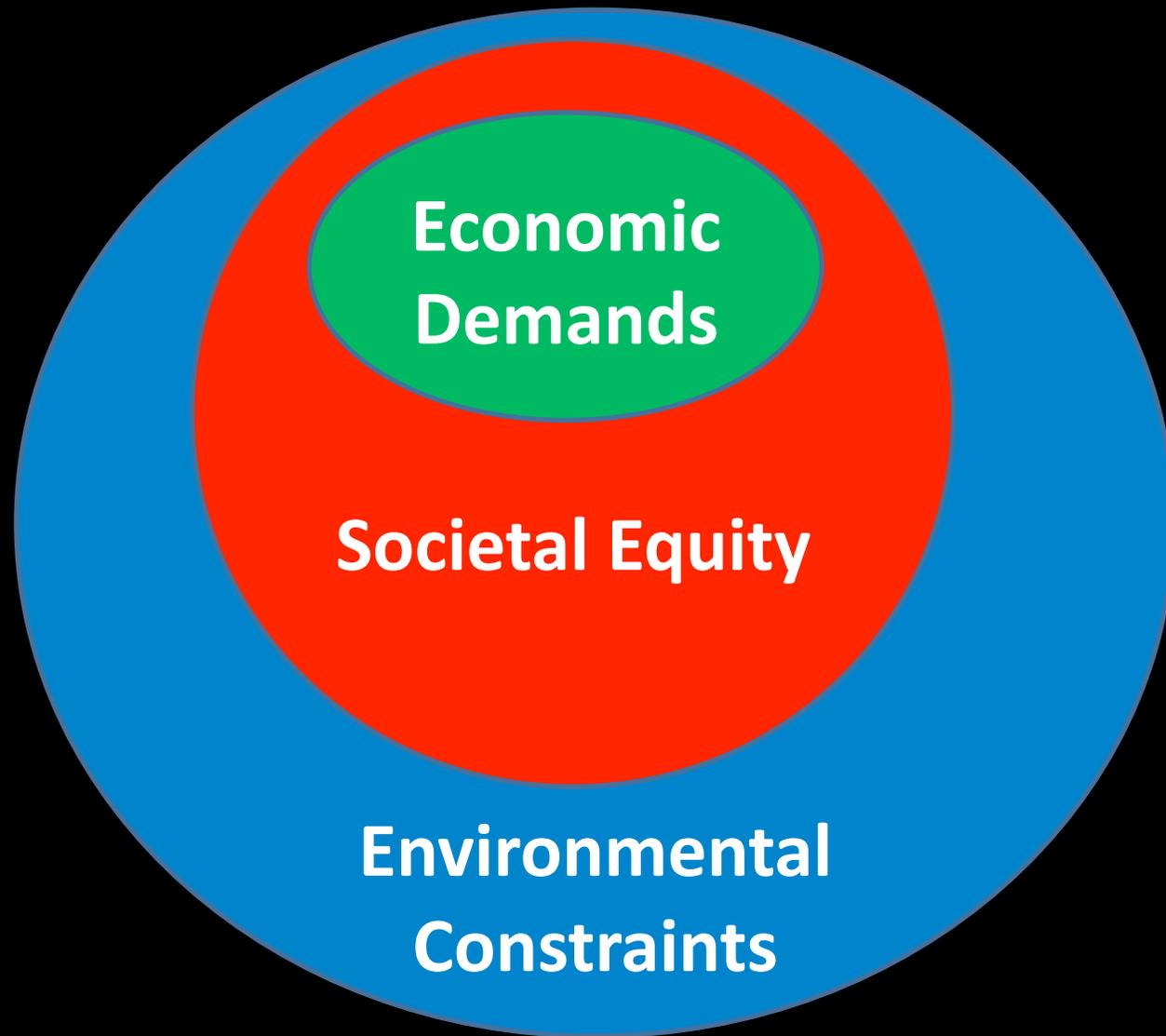
Governing the Commons



**Environmental
Constraints**

2005 World Summit on Social Development

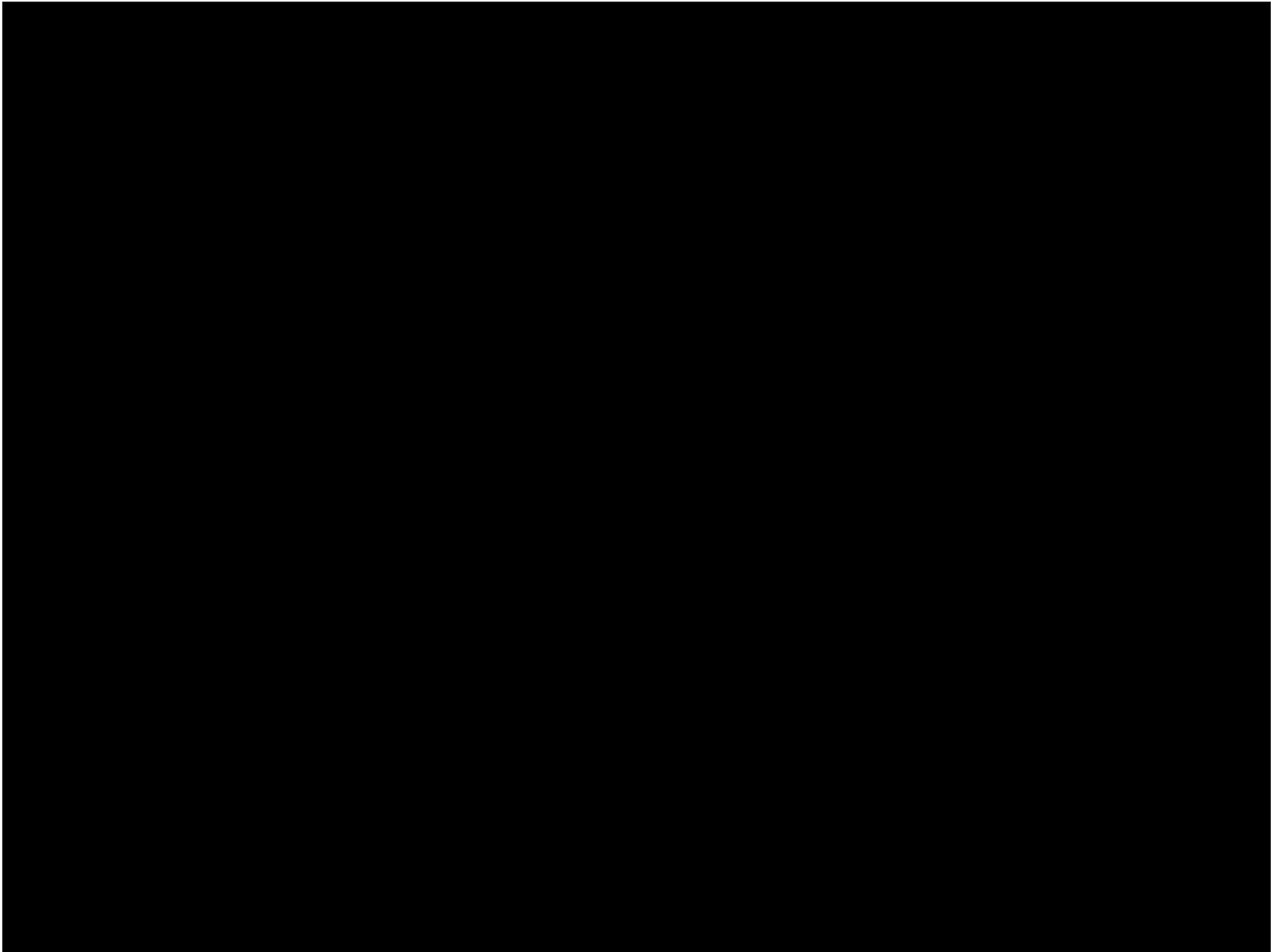
Three Pillars of Sustainability





Thank You

Photo by Chris Helzer



Restored Sand Prairie along Platte River



Photo by Chris Helzer

Showy Evening Primrose Summer After a Fire



Photo by Chris Helzer

Patch-Burn Grazing Along Platte River



Photo by Chris Helzer