



Finding the Balance: Managing water for people and nature

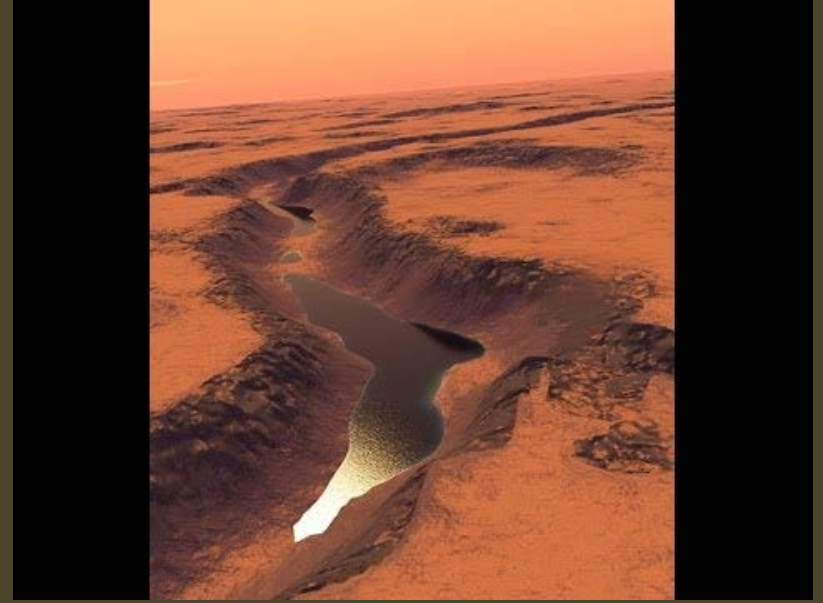
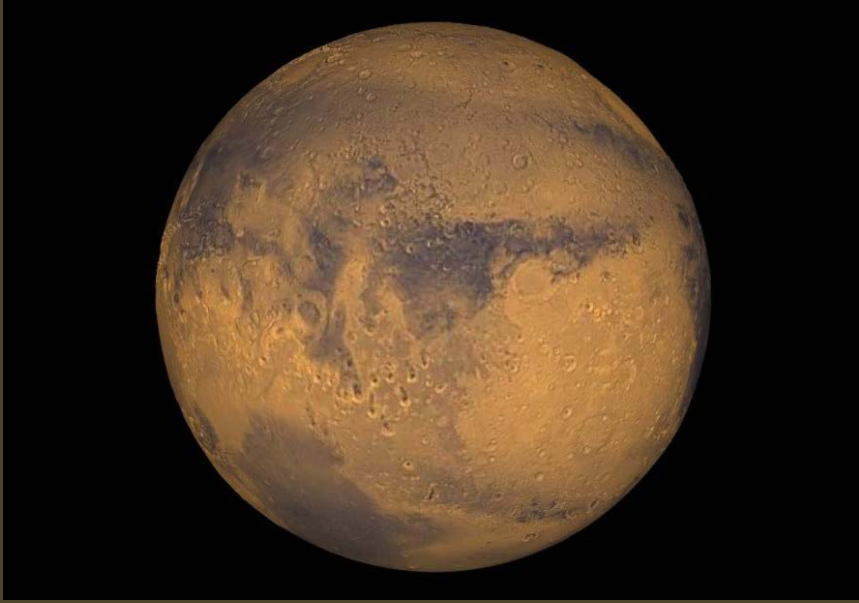
Poudre River Forum
Greeley, Colorado

Brian Richter

Chief Water Scientist, The Nature Conservancy
President, Sustainable Waters
Professor, University of Virginia



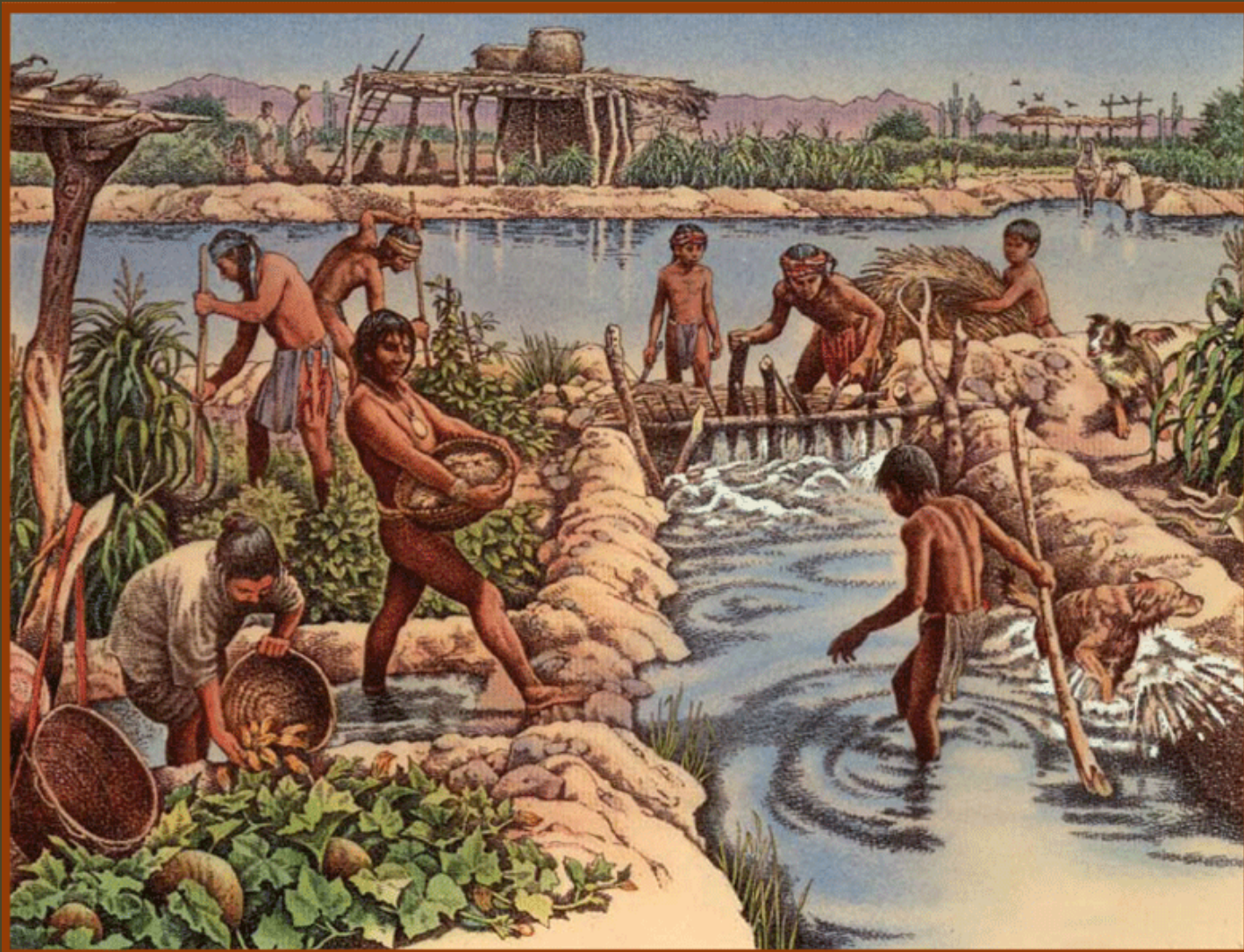
From the film *Ten Canoes*



Water on Mars
Photos from NASA's Mars Reconnaissance Orbiter



“Water Holes and Rivers” painting
by Farren Furber Jamptjinpa





Hoover Dam & Lake Mead



Imperial Valley, CA

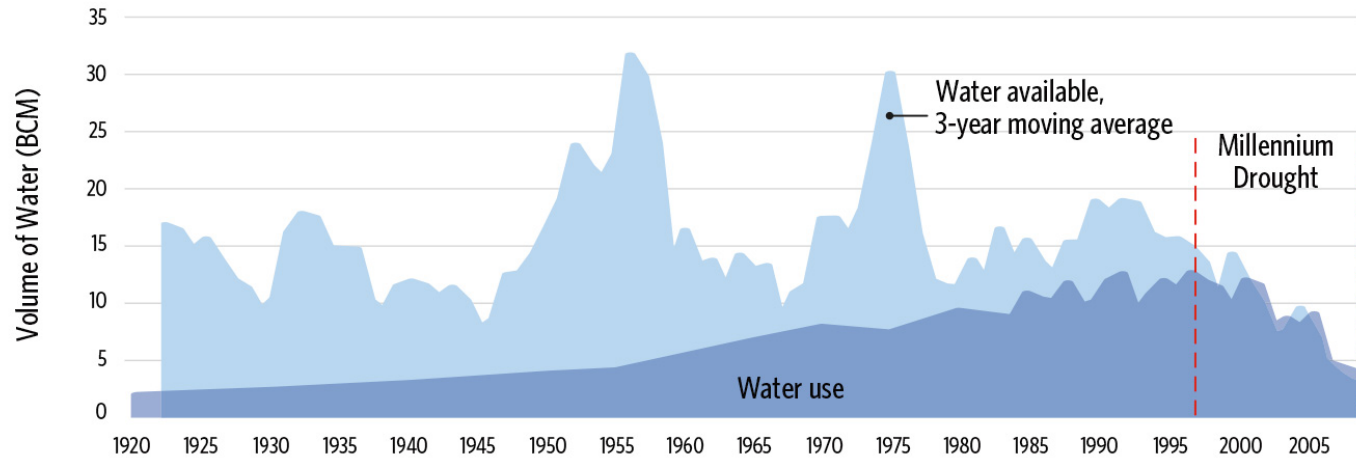


Dakar, Senegal

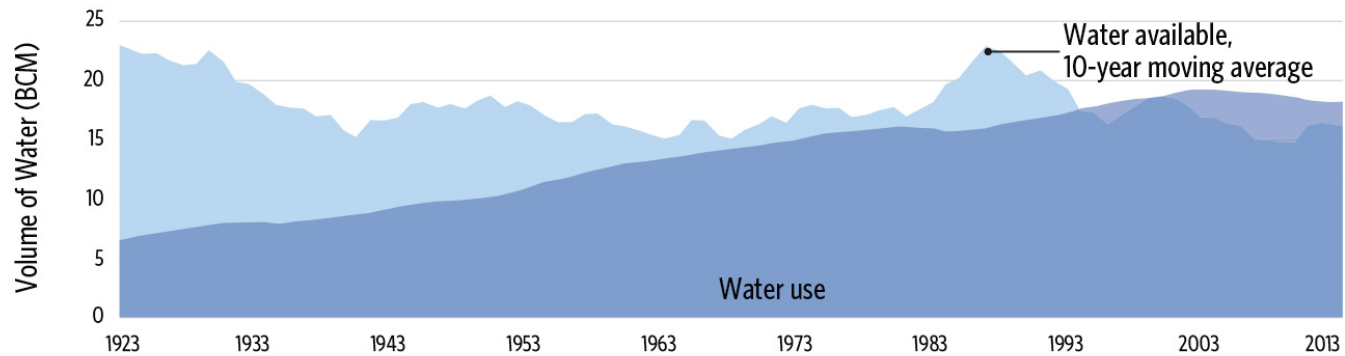


High Plains Aquifer, KS

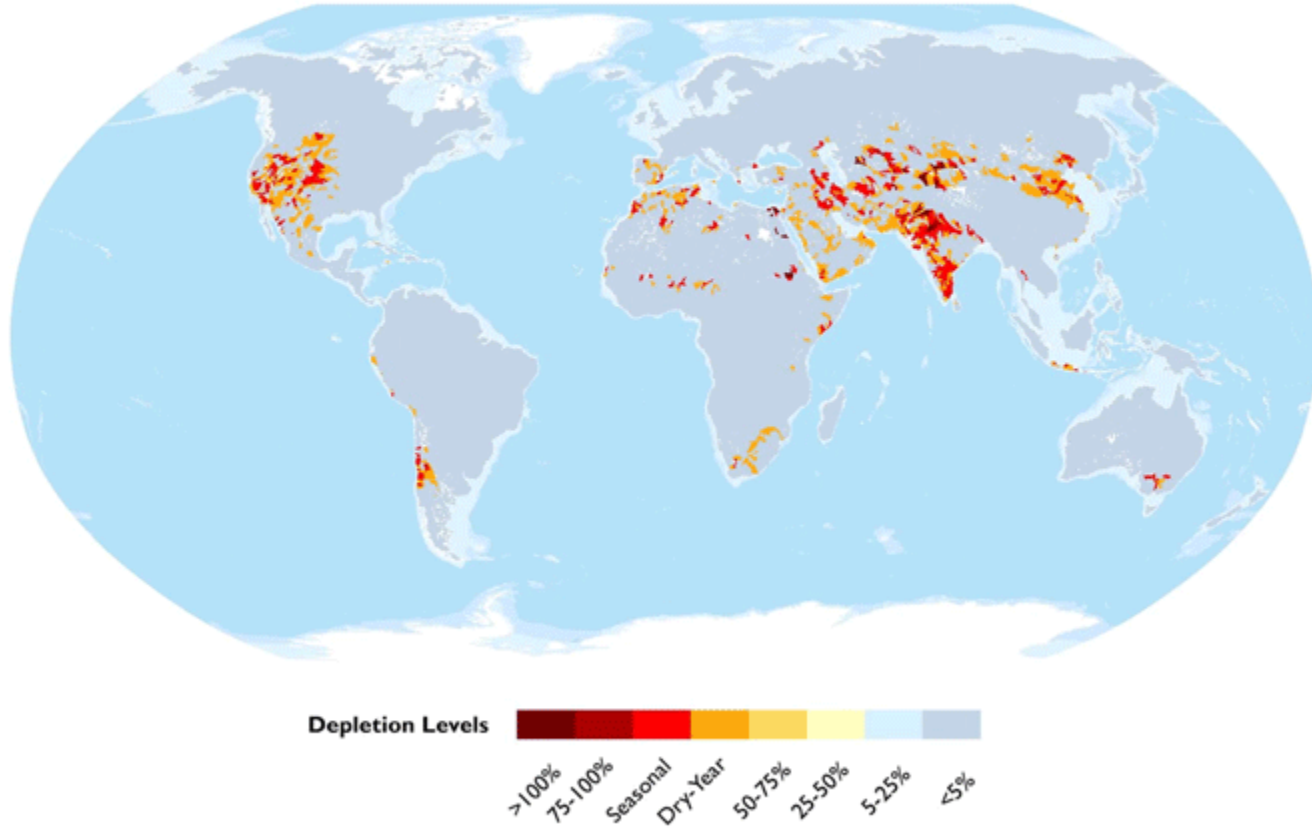
Water availability and use in the Murray-Darling Basin of Australia



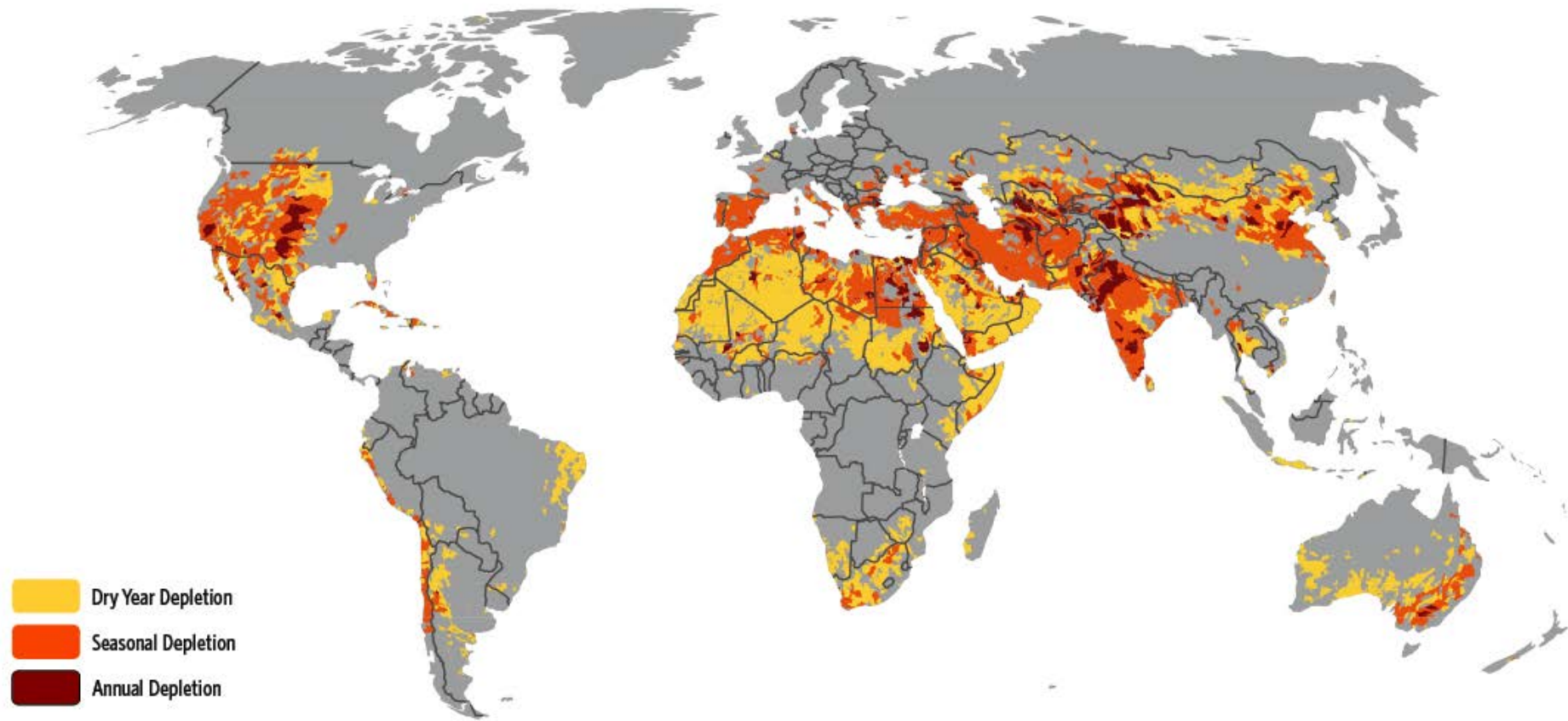
Water availability and use in the Colorado River Basin of the United States



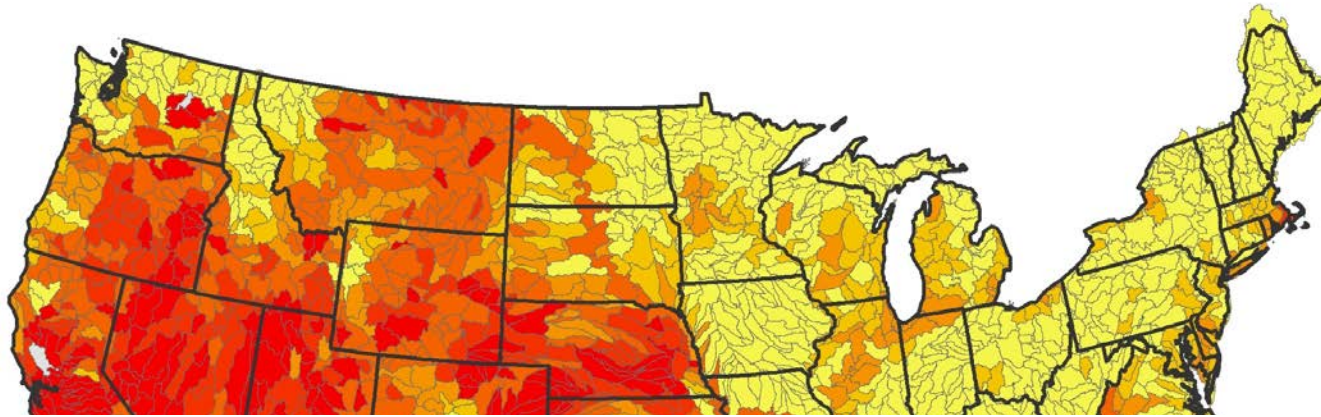
1900



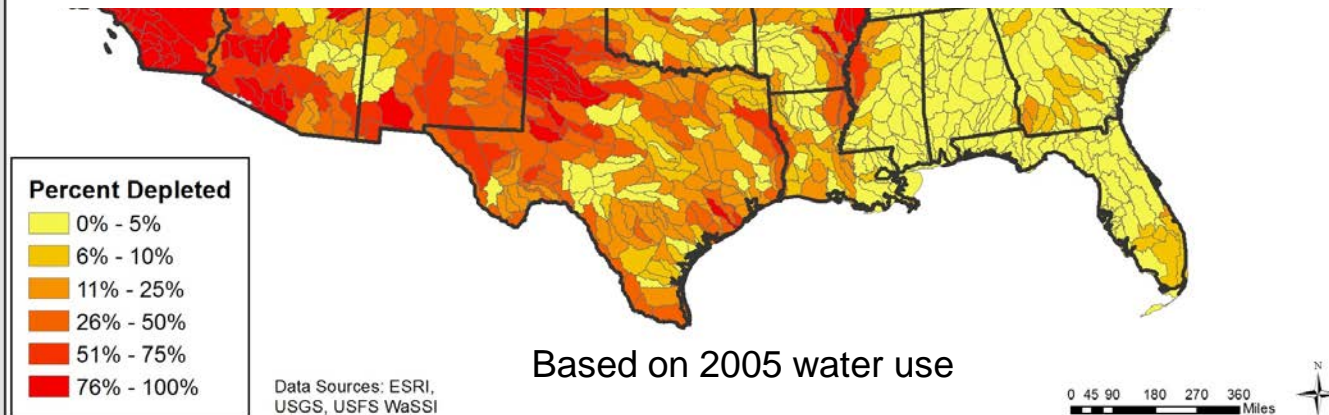
Water depletion for agricultural irrigation



Water shortages are occurring in 1/3 of the planet's watersheds and aquifers
1/2 of the world's population is affected
3/4 of the world's irrigated acreage is affected



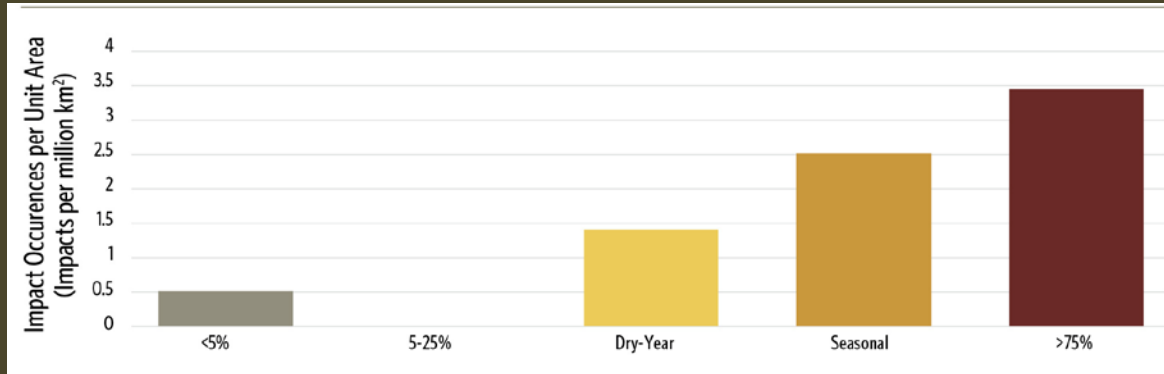
**Half of Western rivers have lost half of their water
One quarter have lost more than 75%**



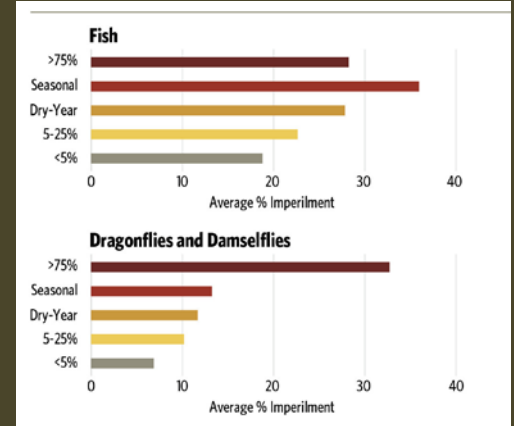
Water Flow Depletion in Summer



Water shortage impacts



Imperilment of species



Water shortages



Building water importation pipelines

A photograph of a brass faucet, likely from a public water source, set against a background of a cloudy sky and a dry, yellowish-brown ground. The faucet is positioned on the left side of the frame, with its handle pointing upwards and its spout angled downwards and to the right. The ground in the foreground is parched and cracked, with some small, dry plants visible. The sky is filled with soft, white clouds, suggesting a bright but slightly overcast day. The overall composition is simple and evocative, highlighting the theme of water scarcity.

Brian
Richter

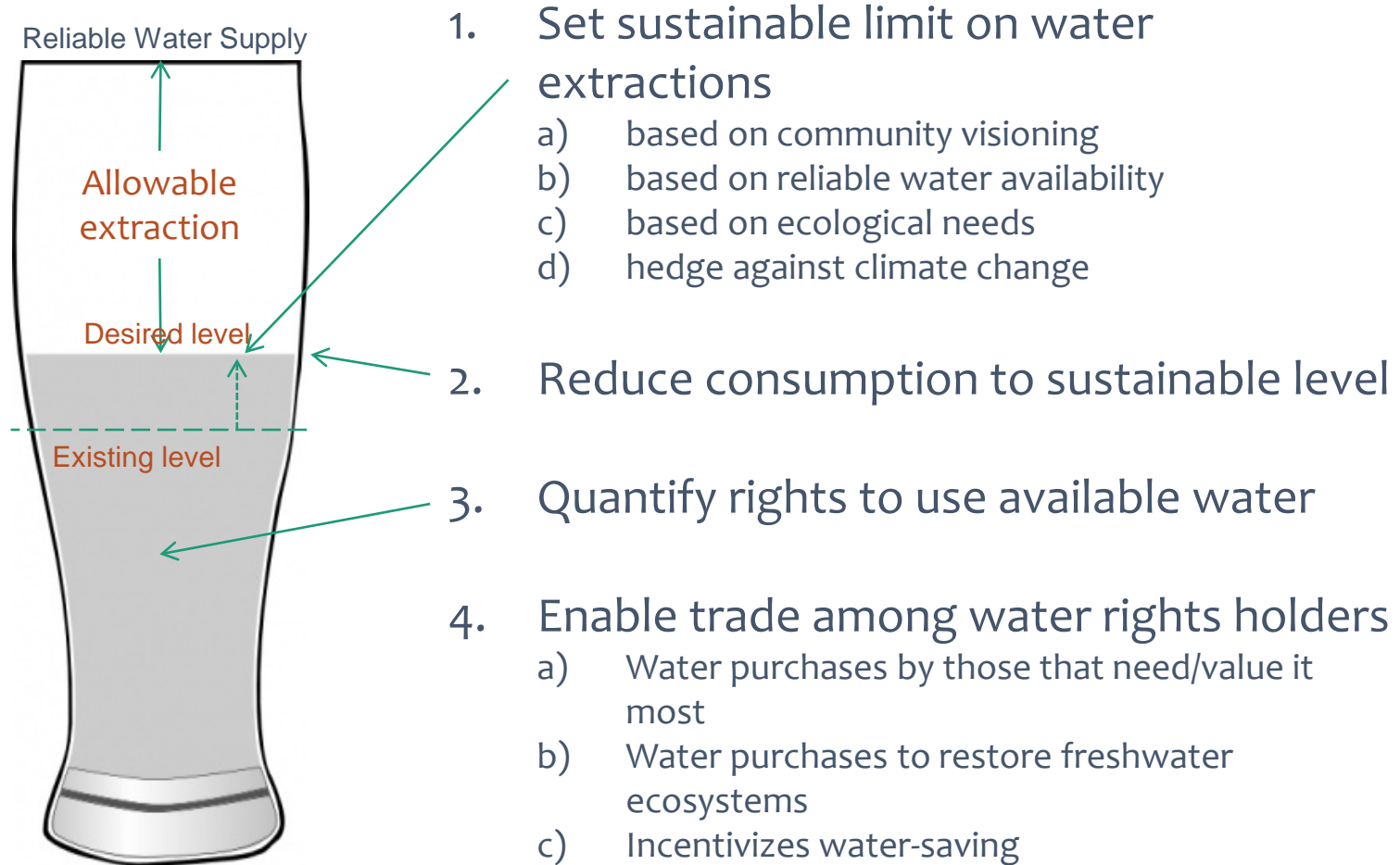
A Guide for
Moving from
Scarcity to
Sustainability

CHASING WATER

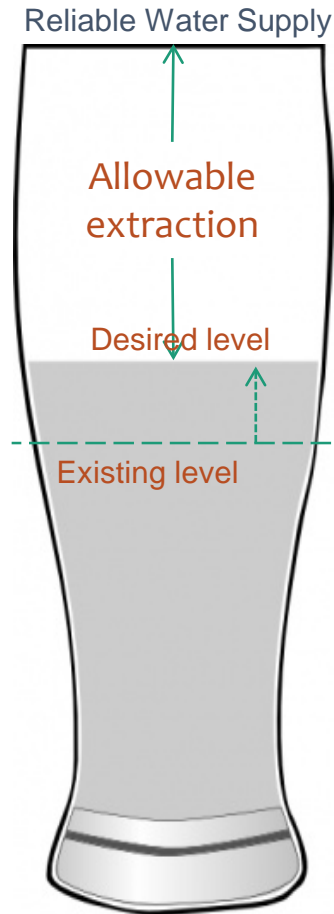


Map by Major John Wesley Powell, Director of US Geological Survey
Eleventh Annual Report of the US Geological Survey, 1890

Recipe for a sustainable water future



Recipe for a sustainable water future



1. Set sustainable limit on water extractions

- a) based on community visioning
- b) based on reliable water availability
- c) based on ecological needs
- d) hedge against climate change

2. Reduce consumption to sustainable level

3. Quantify rights to use available water

4. Enable trade among water rights holders

- a) Water purchases by those that need/value it most
- b) Water purchases to restore freshwater ecosystems
- c) Incentivizes water-saving

Big Solution #1: Create water

(each gallon we don't consume is a
gallon available for other users or
nature)

Water sustainability in cities



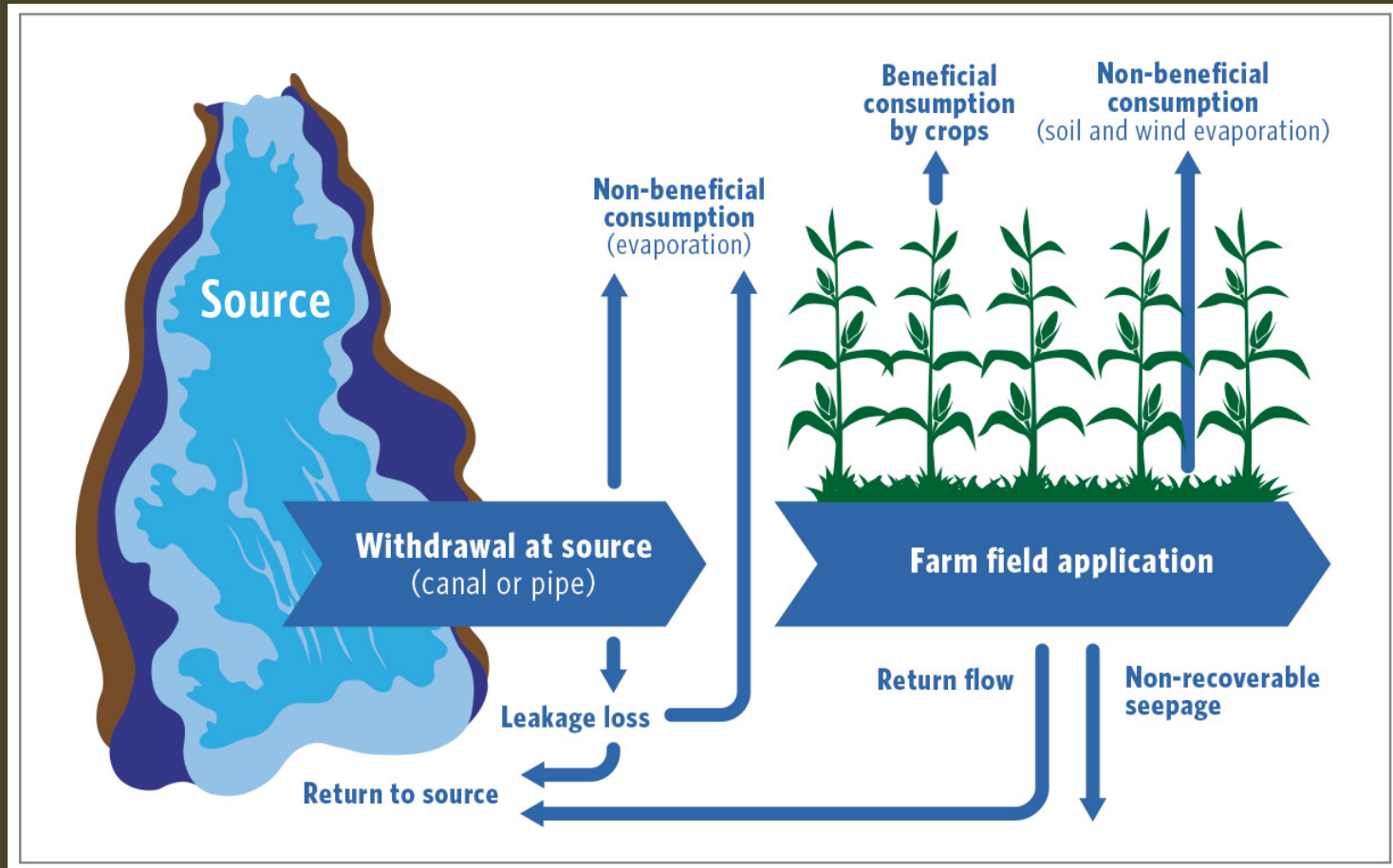
Los Angeles, California

Outdoor landscaping

Sydney, Australia



Water sustainability on farms



“Opportunities for Saving and Reallocating Agricultural Water to Alleviate Water Scarcity”
(*Water Policy*, Richter et al, 2017)



Flood irrigation

Improvements in water application
34-57% savings in consumptive use

Drip irrigation





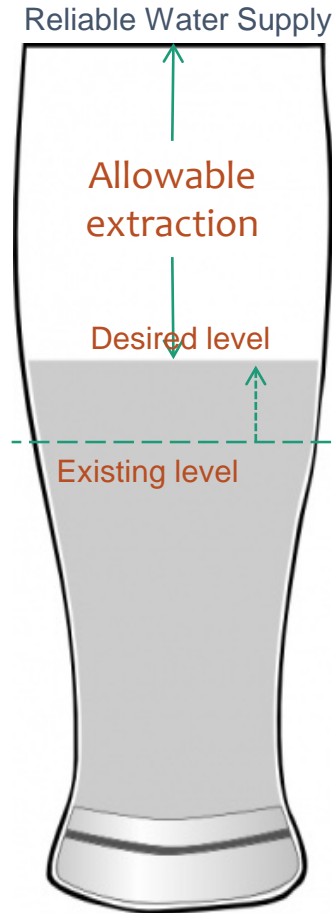
Cotton

Saving water by crop shifting
54-87% savings in consumptive use

Vegetables



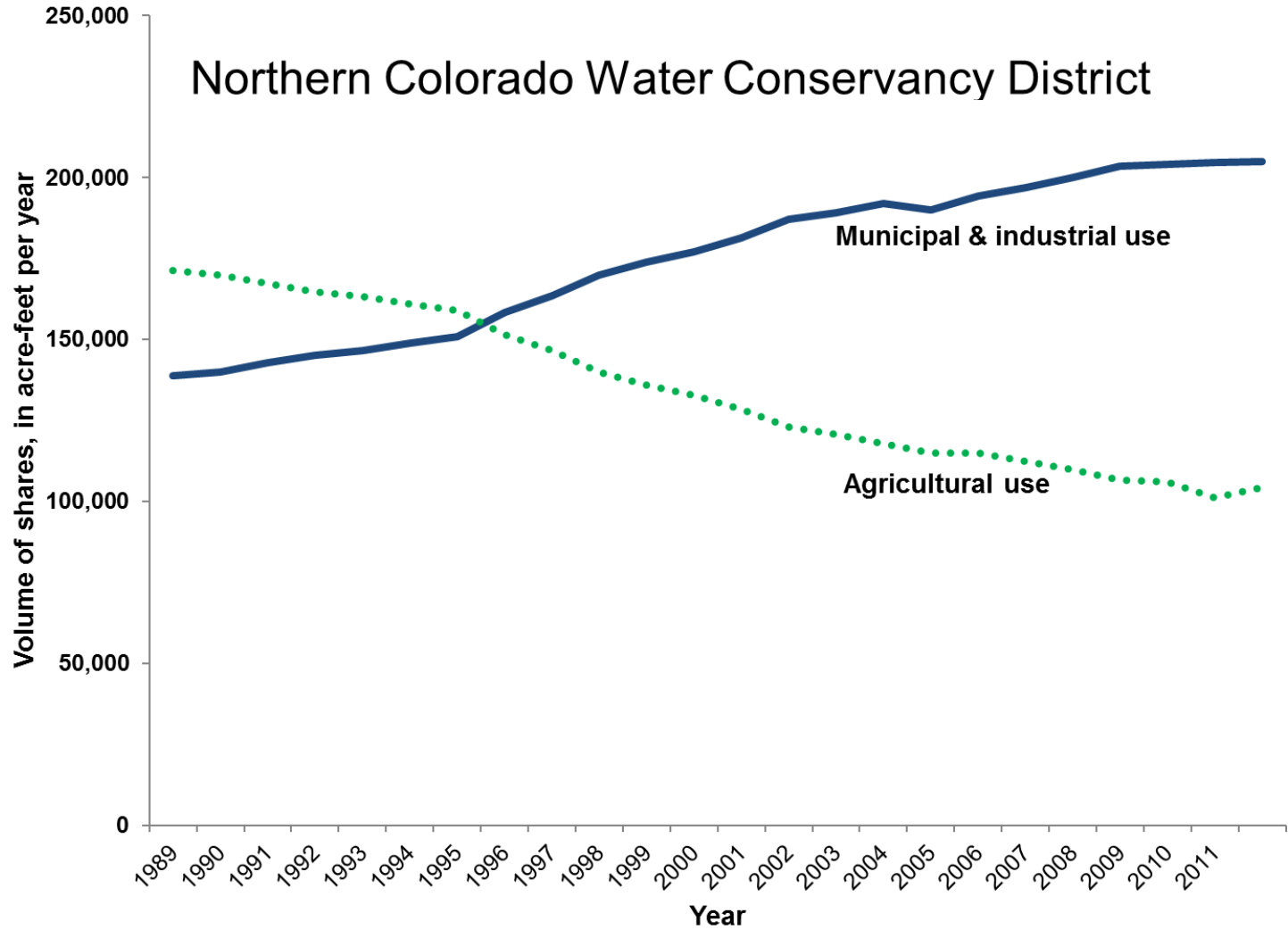
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Big Solution #2: Sharing water

Northern Colorado Water Conservancy District



Transfer of
saved water =
1/3 of city's
water supply



San Diego

\$60M per year
to farmers

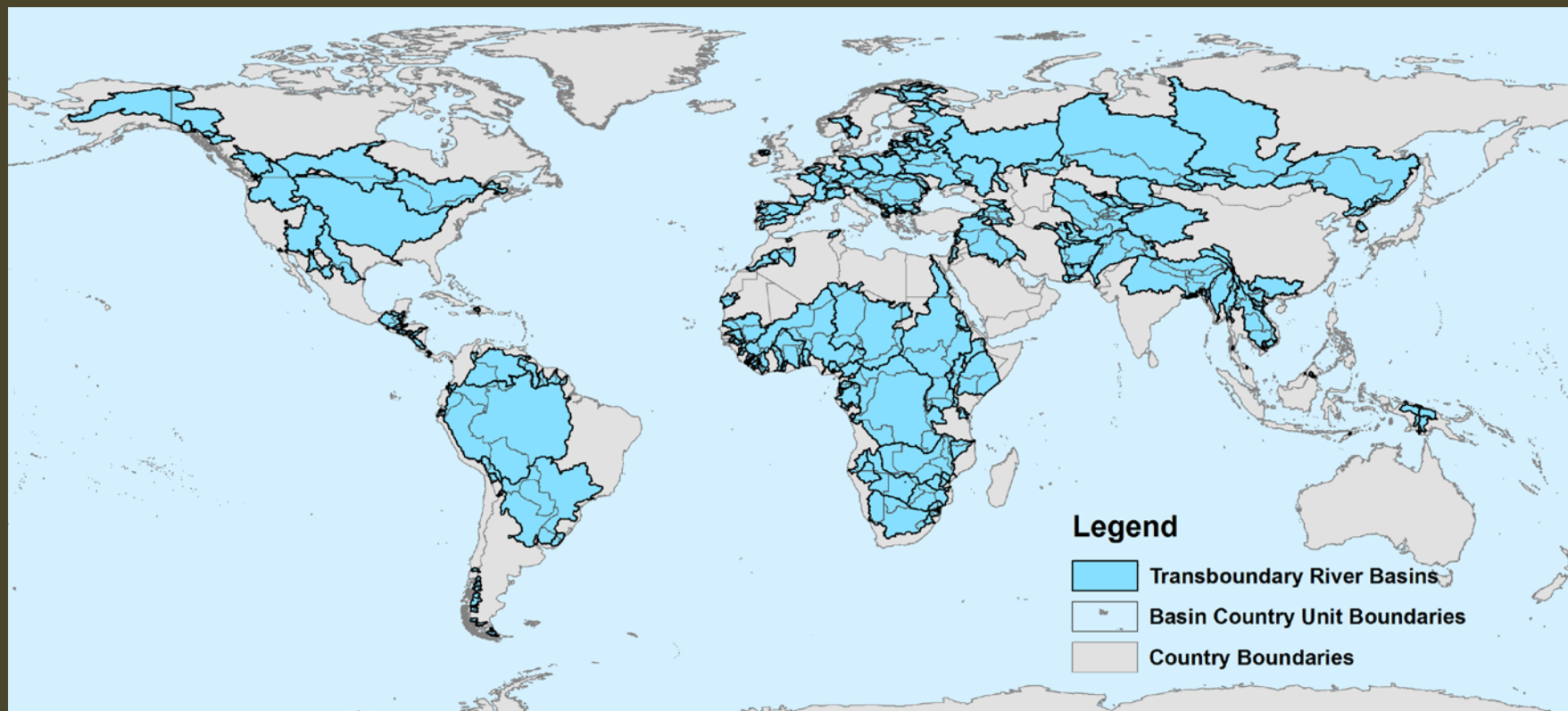


Imperial Irrigation District



Improved
water use

Helping farmers make the transitions



The background of the book cover is a photograph. The upper half shows a blue sky with scattered white clouds. A brass faucet with a cross-shaped handle is positioned on the left side, extending horizontally towards the center. The lower half of the image is a dry, yellowish-brown field, possibly a desert or a drought-stricken area. The overall composition suggests a theme of water scarcity and the search for sustainable water sources.

Brian
Richter

A Guide for
Moving from
Scarcity to
Sustainability

CHASING
WATER