Climate Change, Drought & Environment

The Definitive Crisis of the 21st Century

Freshwater Scarcity
We Call it Planet Earth, but it is Planet $\text{H}_2\text{O}$

It is Saline Water
Evidence suggests that the major global crisis of the 21st century will be widespread freshwater scarcity.
Water Use Facts:

- Water consumption doubles every 20 years, outpacing population growth.
- By 2025 demand will exceed supply by 56%.
- Direct linkage between:
  - water
  - energy
  - food
  - security
Global Protracted Droughts
Darren Stallwitz, stands in his cornfield, in Dumas, Texas, and Aug. 13, 2011.
Vladimir Putin bans grain exports as drought and wildfires ravage crops

- More than a third of cultivable land in Russia destroyed
- Wheat prices hit 23-month high on commodities market

Tom Parfitt in Moscow
The Guardian, Thursday 5 August 2010 13.35 EDT
In the US: Water Shortages

Metropolitan Water District of Southern California reduced supplies to member agencies and 19 million residents
Projected Water Sustainability Index (2030): US

Under today’s climate conditions

With predicted climate change factored in

What We Need:

• Education in water conservation

• R & D to:
  • Reduce use in agriculture.
  • Increase efficiency in all sectors.
  • Reduce energy costs of desalination.
  • Reduce power plant cooling requirements
  • Find a new source
What We’re Working On:

Stimulate technology innovation through the *Sustainable Water Challenge*. 

*cash prize directly funded by Congress through GAO Red Book (GAO-04-261SP Appropriations Law-Vol. 1. Page 4-162) for details about the challenge go www.sigmaxi.com
Why Offer a Prize?

• The McKinsey Report notes aggregate value of awards has tripled to $375+ million

• The CRS Report found prizes as high as $10 million and more than $500 million for unique ideas

• The US agencies offering prizes include DOD, DARPA, DOE, EPA, and NASA.
Goals: Produce, Prevent, Protect

**Produce** drinking water at a competitive cost.

**Prevent** freshwater shortages that impact agricultural food production.

**Protect** the environmental gains and enable maintenance that sustains aquatic ecosystems in the future.
Concurrently with the announcement of the *Sustainable Water Challenge* several companies came forward.

TransGlobal H2o in Houston has developed a technology that allows farmers to irrigate with low saline groundwater.
Buckeye, Arizona Day - 23
Buckeye, Arizona Day - 62
Buckeye, Arizona Day - 62
Buckeye, Arizona Day – 113
Why is this Important?

Low saline water is a vast and underutilized water source.

From USGS Fact Sheet 075-03 (October 2003)
Thank You!

Michael A Champ, Ph.D.
Executive Director

*The Sustainable Water Challenge*
Sigma Xi

O: (703) 237-0505
F: (703) 241-1278
Cell: (703) 946-6655

www.sigmaxi.com
machamp@sigmaxi.com