

Department of Defense Water Security Challenges

ACCO Conference
June 2012

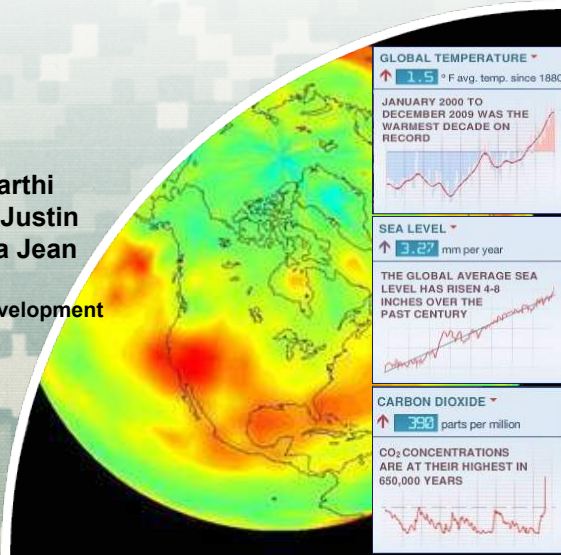
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With contributions from Swarhi
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Palmer Maloney

all from the Engineer Research and Development
Center



US Army Corps of Engineers
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Water Security Concerns

- Is their adequate water available now and in the future?
- Is access to water or cost of water an issue that limits feasible use for populations?
- Is the water quality sufficient for intended uses?
- How is human activity impacting water quality?
- Are we conserving and reusing water to greatest extent practicable?



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Water Security Impacts to Stability



Water in Theatre
Disaster Preparedness
and Response
Humanitarian Assistance
Regional Stability
Secure Navigation

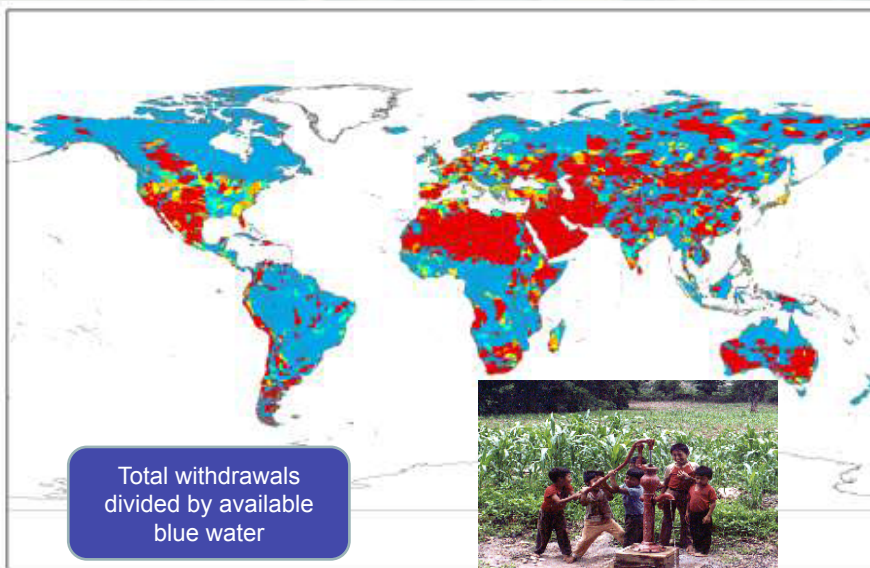
Over the next 20 years and more, certain pressures – population, energy, climate, economic and environmental - could combine with rapid cultural, social, and technological change to produce new sources of deprivation, rage and instability.

Robert Gates, former Secretary of Defense



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Water Withdrawal Ratios 2009



Total withdrawals
divided by available
blue water





Water Challenges in Zaranj City, Nimruz Province

Surface and groundwater brackish with microbial contamination

Sewage treatment Lacking

Substandard quality for water taste and smell

Population vulnerable to water-borne disease

"Thousands of Families in Zaranj are faced with Water Scarcity." Source: Sabir, A. S. 2008, RAWA (Revolutionary Association of the Women of Afghanistan) newsletter, 21 June.

Source: Iranian Ministry of Energy, "Iran Power & Water" Special Edition, May 2010, pgs. 120-121.

Public Health Challenges directly related to poor water quality: skin conditions, mouth infections, diarrhea.

60% patients in one local clinic made ill by drinking local water.

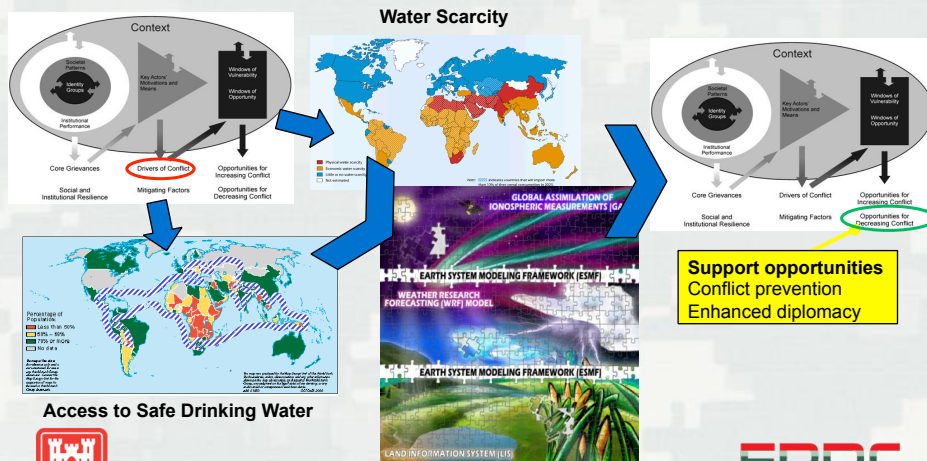
Source: Ghashtalai, H. 2003. "Thirsty Town Taps into Iran: Drought-stricken border region looks around for vital water supplies." In ReliefWeb, 13 November, AAR #81.



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Terrain and Weather as Drivers of Conflict

Army Terrestrial-Environment Modeling and Intelligence System (ARTEMIS): Terrain and weather prediction tool that aggregates meteorological, agricultural, hydrological and changes to built up environment data to identify opportunities to decrease conflict.



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ERDC

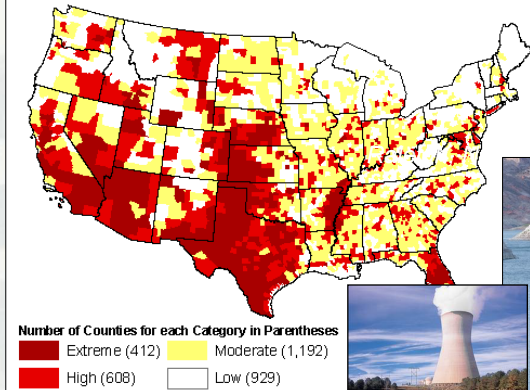
Innovative solutions for a safer, better world



Regional Water Supply Studies

- Assess 30-year water supply and demand for 15 regions with Army installations

Water Supply Sustainability Index (2050) With Climate Change Impacts



Fort Bliss, TX, Fort Bragg, NC
 Camp Shelby, MS, McAlester AAP, OK
 Fort Benning, GA, West Point, NY
 Fort Hood, TX, Fort Carson, CO
 Fort Campbell, TN/KY, Fort Riley, KS
 Joint Base Lewis-McChord, WA
 Fort Irwin, CA, USAG Humphreys, Korea
 USAG Grafenwoehr, Germany
 USAG Vicenza, Italy



Energy-Water Nexus

Raleigh, NC

Over withdrawal

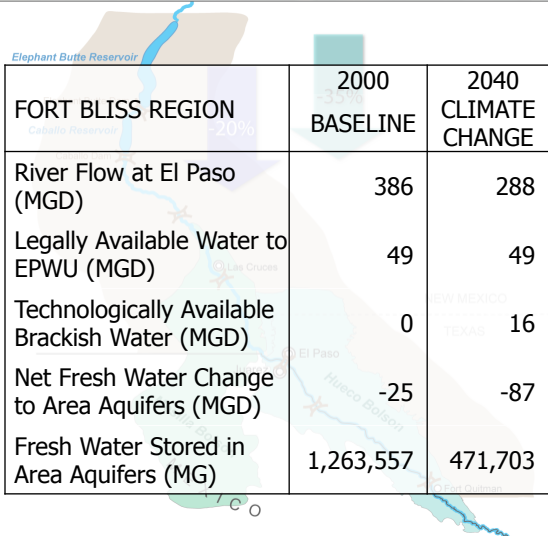
Aging Infrastructure

Lake Meade

Fort Bliss, Texas Critical Asset in a Vulnerable Region

- Largest maneuver area in the U.S.
- El Paso: 3rd fastest growing MSA
- Bliss - 300% increase by 2012; \$5B const
- State boundaries/International borders
- Chihuahuah Desert: 8-10"/year
- Bliss – just announced Army target, net zero energy, water and waste by 2020

2040 Water Supply Scenarios



FORT BLISS REGION	2000 BASELINE	2040 CLIMATE CHANGE
River Flow at El Paso (MGD)	386	288
Legally Available Water to EPWU (MGD)	49	49
Technologically Available Brackish Water (MGD)	0	16
Net Fresh Water Change to Area Aquifers (MGD)	-25	-87
Fresh Water Stored in Area Aquifers (MG)	1,263,557	471,703

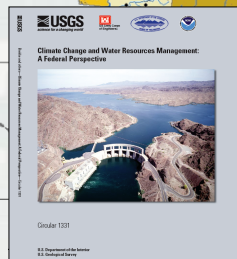
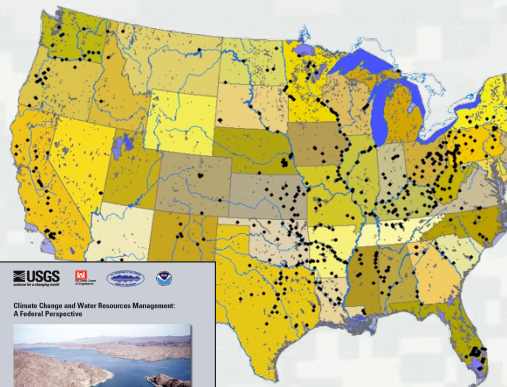
1. Climate Change
2. Juarez Pumping
3. Induced Recharge
4. Desalination
5. Worst Case



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Water Resources Management

Navigation, Flood Control, Hydropower, Water Supply, Recreation



• Civil Works Dams

