





## Water Challenges

- Energy/water nexus
- Consumption and withdrawal have increased as population has increased
- Aging infrastructure
- Complex water rights issues
- Cost vs. price imbalance
- Quality degradation





## Long-term Regional Studies with Broad Applicability

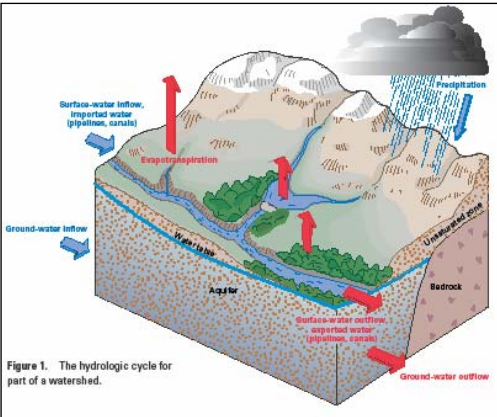
- Assess 30-year water supply and demand for sample of Army installations
  - ▶ Method developed in 2009 at two pilot studies
    - ▶ Applied to 10 domestic and 3 overseas installations
 

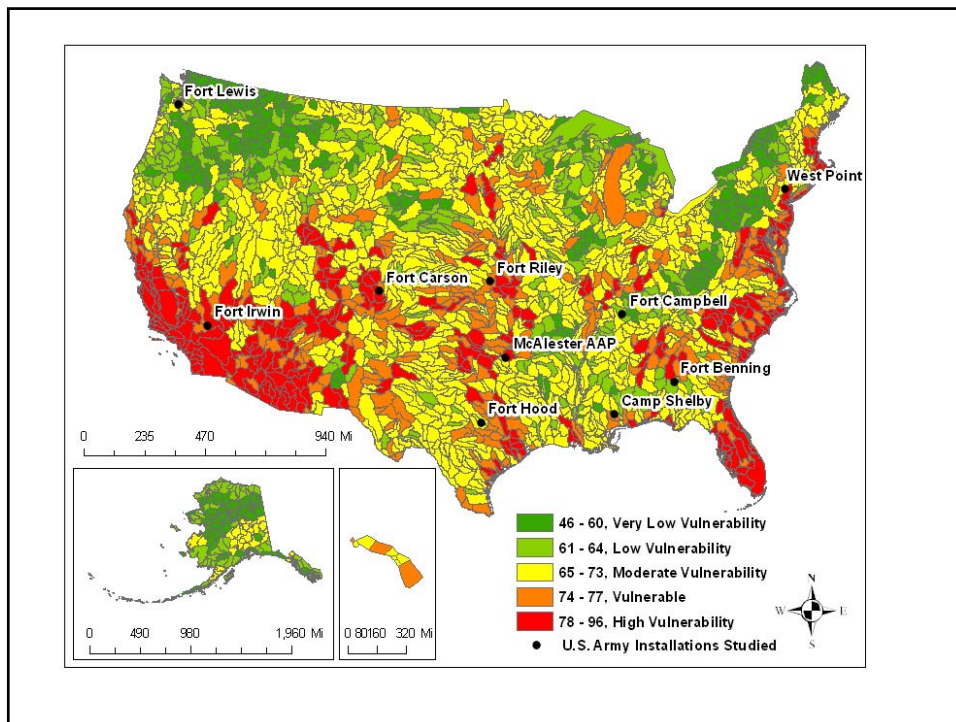
- Fort Bliss, TX
      - Fort Bragg, NC
      - Camp Shelby, MS
      - McAlester AAP, OK
      - Fort Benning, GA
      - West Point, NY
      - Fort Hood, TX
      - Fort Carson, CO
      - Fort Campbell, TN/KY
      - Fort Riley, KS
      - Joint Base Lewis-McChord, WA
      - Fort Irwin, CA
    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





## Regional Water Balance


- Supply
  - ▶ Rivers
    - ▶ Aquifers
      - ▶ Installation
        - ▶ Public Supply
          - ▶ Domestic
            - ▶ Industrial
              - ▶ Agriculture



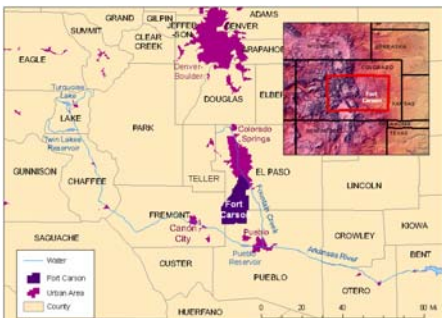







## Fort Carson, CO




- Award winning water conservation program
  - Alternative sources, recycling, and reclamation
- Regional over appropriation of water resources
- Climate change may lead to declines in runoff, higher temperatures, and earlier snowmelt
- Increasing infrastructure costs









## USAG Humphreys, South Korea




- Increasing demand
- Fluctuating supply
- Lack of access to relatively abundant water resources
  - Natural patterns of seasonal and regional water distribution
  - Condition of distribution systems
  - Topography






- Water quality
  - ▶ Non-point source pollution
  - ▶ Wastewater treatment
- Water storage planning
- Climate change: temperature rise, increased variability of precipitation



## General Observations



- Need installation of more water meters
- Water rights may be limiting factors for some installations
- Climate change will exacerbate scarcity in arid regions and affect availability in historically wet regions
- Need long-term strategy for water management



## Contact Information



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Report will be posted on <http://www.aepi.army.mil>