Goal of Presentation

• Provide a National perspective on water-related issues impacting irrigated agriculture
  – Historical trends leading to current conditions
    • Water use
    • Irrigated acres
    • Crop applications

• Issues for consideration
Water Withdrawals and Use Estimates, 1960-2000

Total & Agricultural Water Withdrawals in 2000
& Withdrawals With Consumptive Use Estimates, 1960-1995

Source: USDA, NRCS, based on Hutson et al, 2004
* Data limitations do not allow estimation of consumptive use in 2000.
Water Withdrawals and Use Estimates, 1960-2000

Total & Agricultural Water Withdrawals in 2000
& Withdrawals With Consumptive Use Estimates, 1960-1995

Million acre-feet per year

Source: USDA, NRCS, based on Hutson et al, 2004
* Data limitations do not allow estimation of consumptive use in 2000.
Water Withdrawals and Use Estimates, 1960-2000

Total & Agricultural Water Withdrawals in 2000
& Withdrawals With Consumptive Use Estimates, 1960-1995

- **Withdrawals in 2000**
- **Consumptive use**
- **Return flow & losses**

Source: USDA, NRCS, based on Hutson et al, 2004

* Data limitations do not allow estimation of consumptive use in 2000.
U.S. Irrigated acres

Source: USDA, NRCS, based Census of Agriculture Data
U.S. Irrigated acres, leading states

Source: USDA, NRCS, based Census of Agriculture Data
U.S. Irrigated Acres & Water Applications

Source: NRCS, based Census of Agriculture Data and Farm and Ranch Irrigation Survey Data
2007 Irrigated Acres by County

Source: Based on 2007 Census of Agriculture Data
How was reduction in applied water accomplished (part 1)?

• Location, Location, Location
  – Reduced acres in higher application areas (Southwest)
  – Increased acres in lower application areas (Southeast & Northern Plains)
Change in U.S. Irrigated Acres location, 69-07

Source: NRCS based on 1969 and 2007 Census of Agriculture data
How was reduction in applied water accomplished (part 2)?

- Location, Location, Location
  - Reduced acres in higher application areas (Southwest)
  - Increased acres in lower application areas (Southeast & Northern Plains)

- Movement to more efficient technology
Changing Irrigation Application Technology

Source: USDA based on Farm and Ranch Irrigation Survey Data
Impact of Improved Efficiency

• Improved accomplishment of target irrigation
  – The infiltration depth for a low-pressure, under-canopy, center pivot (or subsurface drip) approaches the target irrigation level

• Decline in the area of field with over & under irrigation
  – Increase in yield and associated water consumed from reduced saturated soils and reduced water stress
  – Reduction in deep percolation with impact on return flows and groundwater recharge

• Increased water use and reduced deep percolation have created environmental & irrigation externalities because
  – Institutions operate on water withdrawals, diversions, or duty
  – Hydrologic system operates on consumptive use
Considerations for the Future

- Irrigation:
  - the major user of water resources nationally;
  - relatively small user of land resources;
  - consumes a greater share of withdrawals than other sectors;
  - will remain a major water user in the future;
  - has opportunities to conserve water, but at a cost, both dollars and other impacts.

- Water quality descriptions switch between legal and hydrologic frameworks with resulting confusion.

- Solutions to water issues require an integrated approach of economics (including markets), law, and engineering.
Thank you!

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