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Presentation by:
Jesse J. Richardson, Jr.
Associate Professor
West Virginia University College
of Law
Lead Land Use Attorney
Land Use and Sustainable
Development Law Clinic







# Water, Water Everywhere, But Nothing to Eat?



### Overview

- Agricultural Water Use in the United States
- Riparianism
- Regulated Riparianism
- Agricultural Preferences
- Priority during shortages
- Special cases
- Conclusions

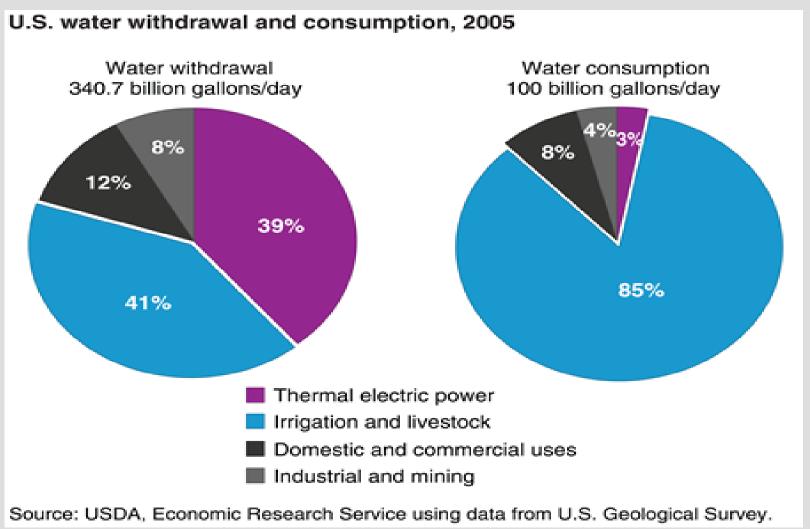


## Agricultural Water Use in the United States

- Freshwater withdrawals in the U.S. in 2010 = 306,000 million gallons/day
- Biggest users
- Thermoelectric power 38.2%
- Irrigation 37.6%
- Livestock watering accounted for another 2,000 million gallons/day, making "agriculture" and thermoelectric withdrawals almost equal quantities
- ¾ surface water (29% agricultural), ¼ groundwater (64% agricultural)
- Consumptive use v. non-consumptive use



## Agricultural Water Use in the United States



# Water required to produce food

Table 2.   Water Required To Produce Selected Foods	
Crops	Water Needed
	(liters per kilogram)
Potato	500-1,500
Wheat	900–2,000
Alfafa	900–2,000
Corn/Maize	1,000–1,800
Sorghum	1,100-1,800
Soybeans	1,100-2,000
Rice	1,900-5,000
Animal Products	(liters per kilogram of meat)
Eggs	3,300
Chicken	3,500–5,700
Goat	4,000
Sheep	6,100
Beef	15,000-70,000
	Source: Pacific Institute (2009)

# Riparianism

- Surface water common law rule in most eastern states, some western states
- Owners of land abutting surface water hold the right to use the water- "reasonable use", sharing
- Groundwater- much more complex, but generally, in the eastern U.S., "reasonable use" by overlying owners
- Approximately 19 states in the east use statutory provisions to supplement the common law- "regulated riparianism"



# Agricultural preferences

- Seven states (Alabama, Connecticut, Florida, Hawaii, Massachusetts, Michigan and North Carolina) have no special provisions for agriculture
- Four states have regulatory exemptions for some types of agricultural withdrawals- Kentucky, New York, South Carolina, and Virginia
- Agricultural uses deemed "reasonable" (Kentucky, Minnesota, and Mississippi)

# Priority during shortages

- Arkansas: (1) domestic and municipal domestic; (2) federal water rights; (3) agriculture; (4) industry; (5) minimum streamflow; (6) hydropower; (7) recreation
- lowa: (1) human consumption and sanitation (private, then public supply); livestock production; (3) irrigation (hay, corn, soybeans, oats, grain sorghum or wheat receives lower priority; (4) water transported across state boundaries; (5) recreational or aesthetic purposes
- Maryland: (1) domestic and municipal uses; (2) agricultural uses; (3) all other uses



### Delaware

- Permits automatically granted for irrigation
- Up to 20 acre-inches per year
- No more then 10 acre-inches per month
- Provisions to limit waste
- Water meters recommended, but not required



# Georgia

- Agriculture initially exempted
- 1988: permits required for agricultural uses greater than 100,000 gallons per day initiated after that date; earlier agricultural uses grandfathered



# Maryland

- Three exemptions from permitting: (1) domestic (other than heating and cooling); (2) withdrawals of less than 5,000 gallons of groundwater per day (in certain circumstances); and, (3) agricultural withdrawals of less than 10,000 gallons per day
- Agricultural withdrawals prior to July 1, 1988 are grandfathered
- Permit applications for agricultural uses exempt from some criteria and conditions
- Except as expressly and specifically otherwise provided by law, all meetings of any governing body shall be open to the public.
- Some common grounds for going into executive session include:
  - Discussion of personnel matters
  - Discussion of pending litigation
  - Consideration of matters involving the purchase, sale or lease of real property



# New Jersey

- Diversions for agricultural or horticultural purposes exempt from permitting, but must obtain 5-year water usage certification if the diversion is more than 100,000 gallons per day
- 2007 amendments to give "a higher level of scrutiny" to agricultural diversions of water
- Amendments challenged, but mostly upheld
- Regulations "minimize regulatory burdens on agricultural endeavors where possible" but to find that the act gives agricultural water uses "a favored position" appears "incongruous"



# South Carolina

- Separate registration and reporting system for agricultural surface water withdrawals
- No permit required
- No public notice for agricultural registration
- Permits time limited, registration lasts indefinitely
- Registered uses presumed reasonable
- No limits on quantity of withdrawals for agricultural purposes
- Administrative appeal for registration for large potato farm settled
- Pending lawsuit challenges provision based on regulatory taking, due process violations and violations of the public trust doctrine



### Wisconsin

- Singles out agricultural uses for stricter requirements
- Additional application requirements
- Must receive "written statements of consent to the withdrawal from all riparian owners who are making beneficial use of the water proposed to be withdrawn"



# Regulated Riparian Model Water Code

- Priority: (1) direct human consumption and sanitation as necessary for health and survival; (2) water needed for survival of livestock or preservation of crops (also includes water required to protect businesses from damage to physical plants and equipment due to lack of water; (3) uses that maximize employment and economic development in the context of sustainable development
- All priorities subject to ranking by the degree of reasonableness
- Temporal priority so long as the public interest is served equally by competing uses



### Conclusions

- Social mores seem to prioritize human life, animal life, plant life
- Some states limit agricultural uses to water necessary for the purpose (Delaware)
- Altering human diets (a difficult task) may be the best way to ensure sustainability of agriculture and water use

