

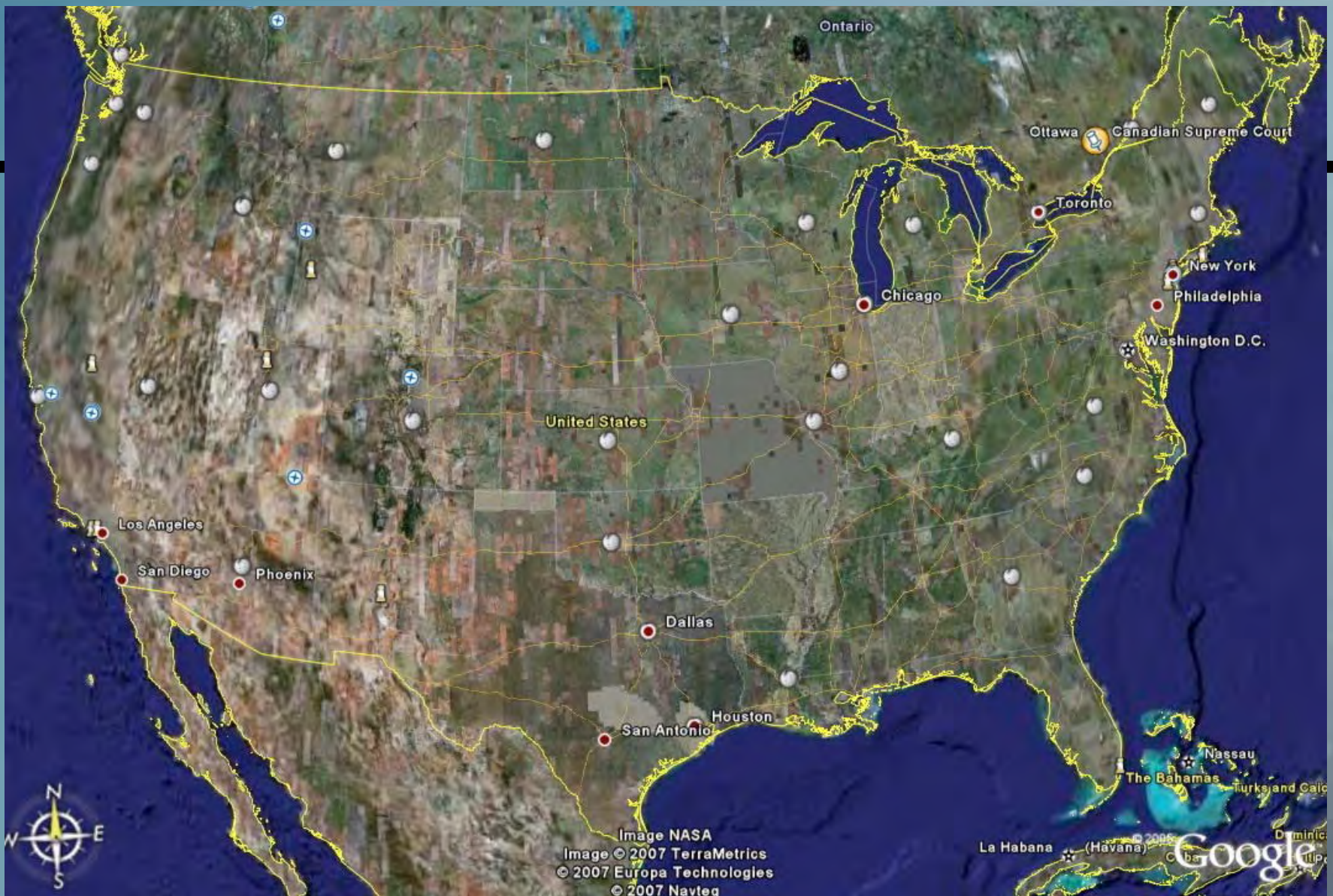
Irrigation

Historical Perspective of Agricultural Water Use in Georgia



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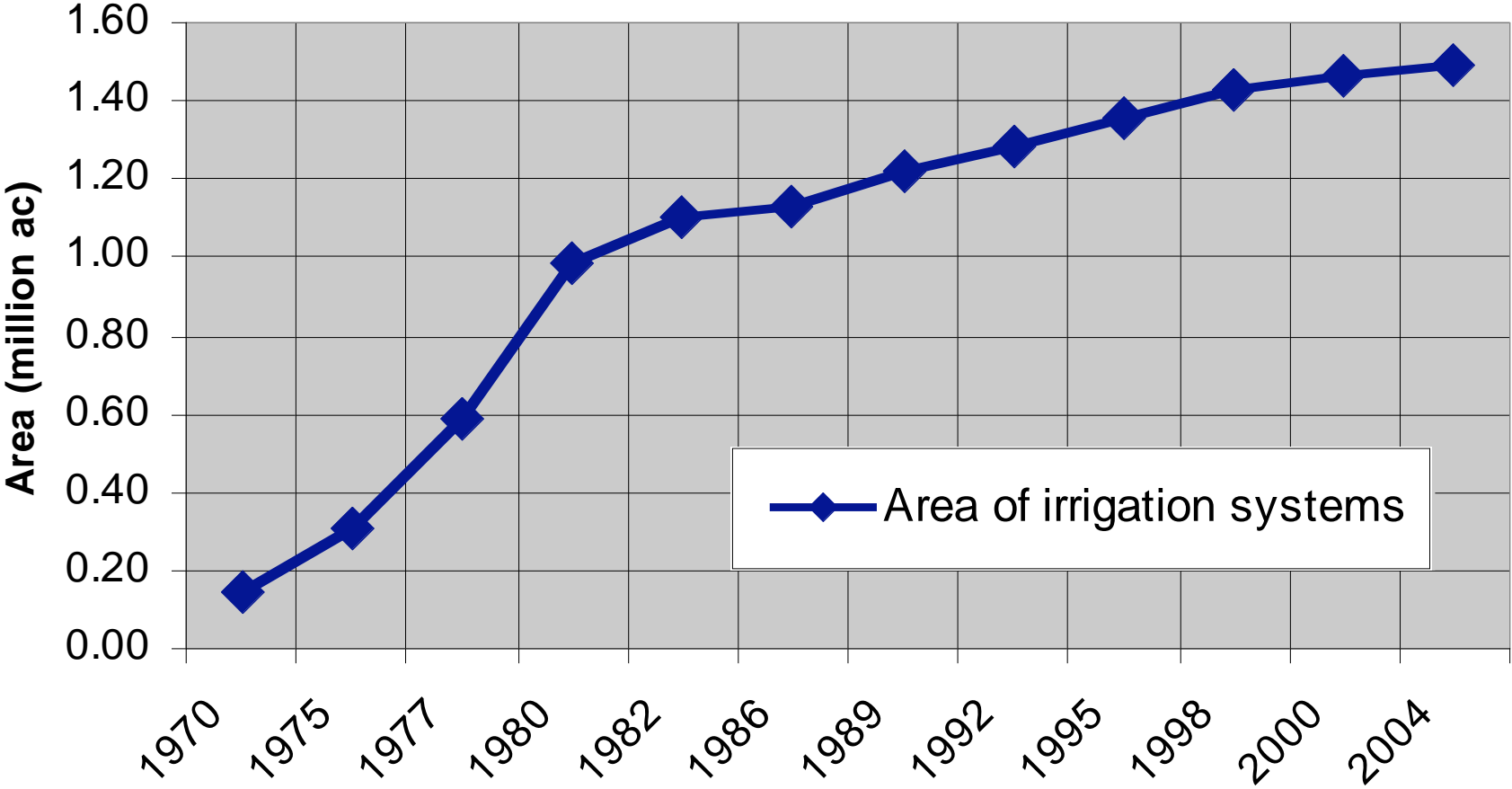


Who, When, How, What, Why

Irrigation, a 'recent' phenomenon in Georgia



Area of Georgia Irrigation Systems





Ponds often built for livestock

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Irrigating tobacco and vegetables with portable pipe and sprinklers. Drought irrigation





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Driving factors for irrigation growth



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Why Irrigation in the East?

- **Reduction of economic risk**
 - < Risk of low prices
 - < Risk of crop failure
 - < Farmers & backers unwilling to accept the risk
 - < Much of expansion began with high crop prices (not seen since)

Why Irrigation in the East?

- **Multiple efficiencies**
 - < Land area
 - < Fertilizer, agrichemical, fuel, labor, etc. all used more efficiently

Why Irrigation in the East?

- **Competition**

- < Once irrigation began non irrigators became more vulnerable to economic failure
- < Couldn't count on low yields driving up prices (US & worldwide marketing negating local impacts)

Operations affected by irrigation

- **Many areas of farm business affected**
 - < Operational loan (availability, amount)
 - < Land rentals
 - < Land values (collateral, resale, taxes)
 - < Vegetable, peanut, early grain contracts
 - < Production and profitability

Irrigation generates new dollars

- **Added Yield Response to Irrigation**

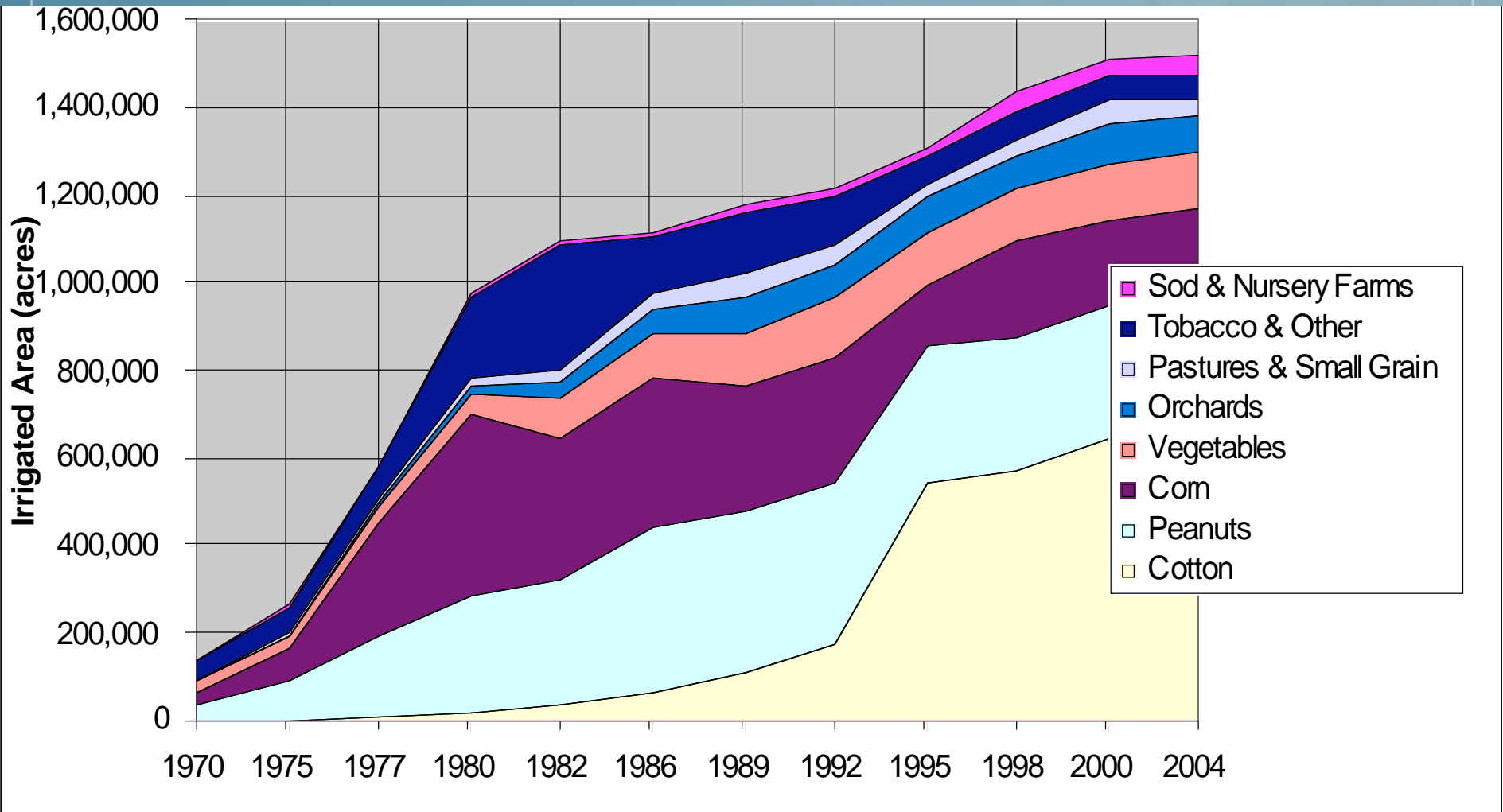
- < Corn 100-120 bu/ac
- < Peanut 1000-2500 lb/ac
- < Cotton 450-900 lb lint/ac
- < Soybean 20-30 bu/ac
- < Pecan +50%
- < Vegetables
- < Sod Production



Economic multipliers mean few billion annually mostly in rural communities.

Directly tied to utilization of a natural resource - water.

Dynamic response to markets



Driving factors for growth

- Sound business practice



Protect existing income

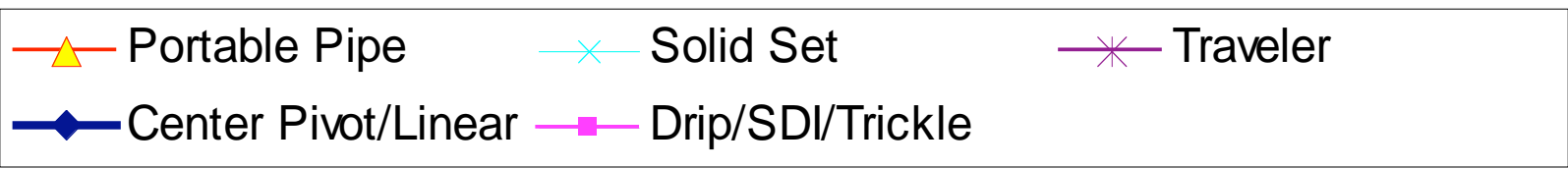
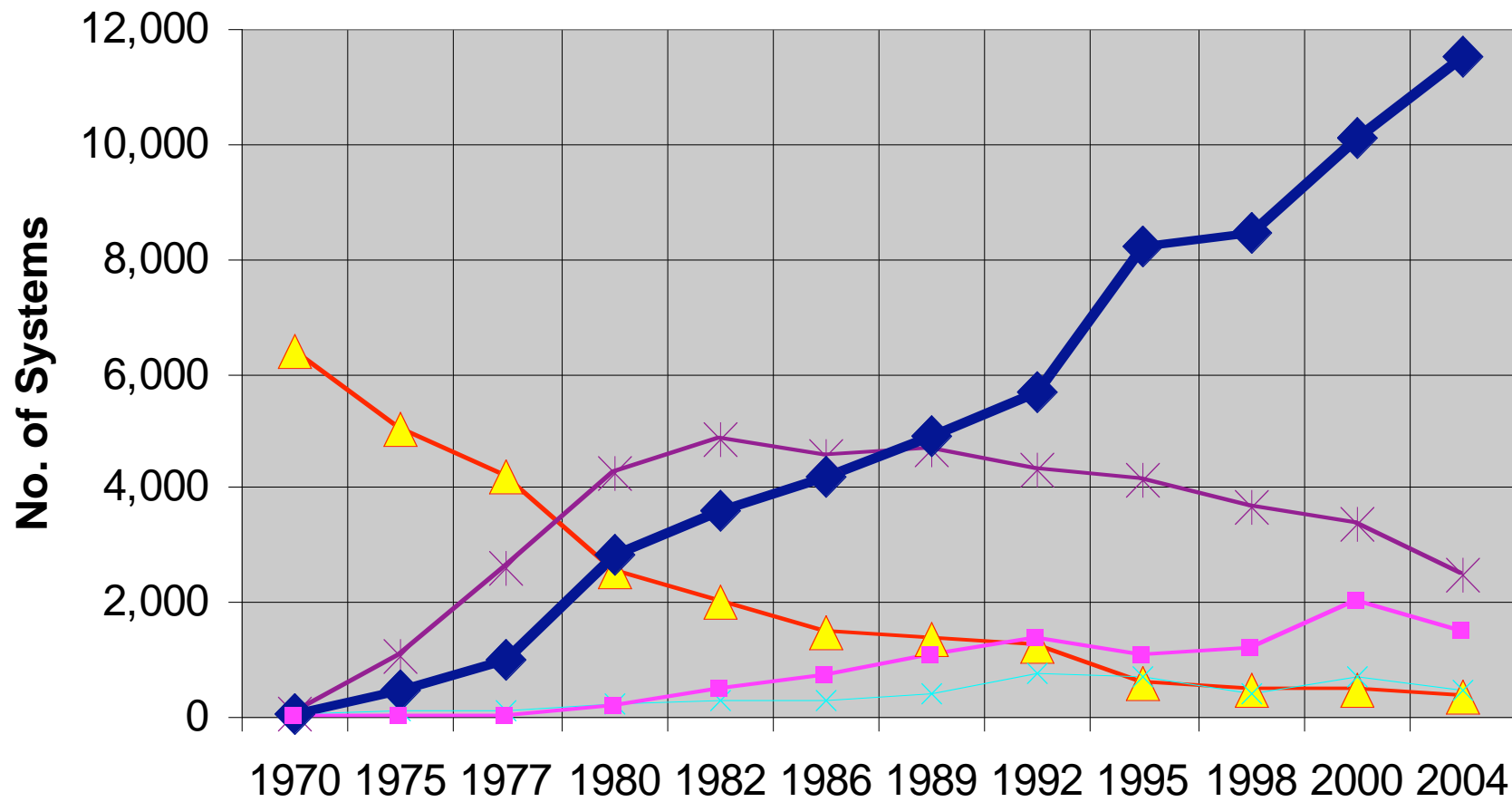
Potential new income to grower

Certain increased revenues for region

Dynamic response to labor & technology

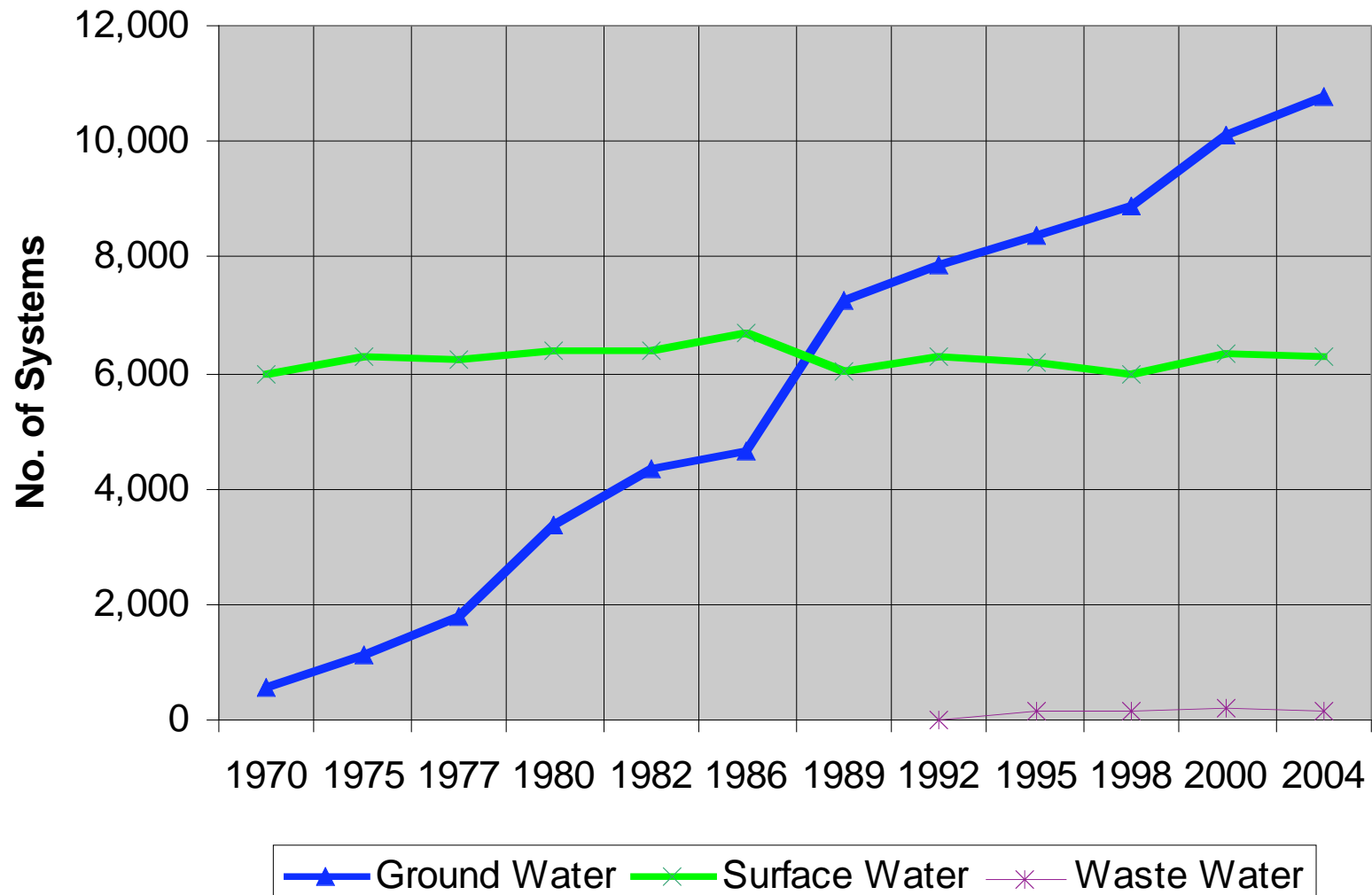


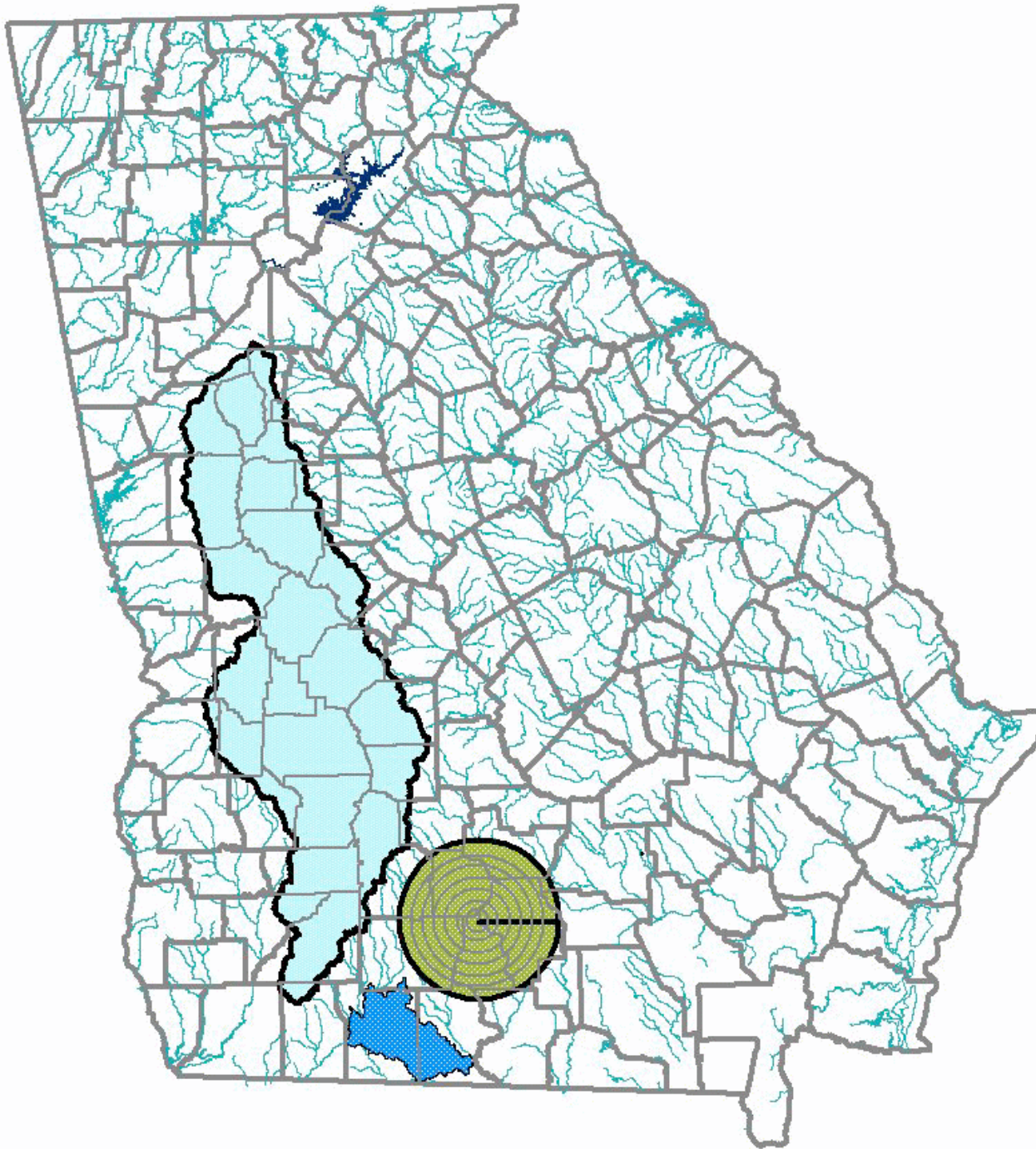
Big gun systems (travelers, hose tow, portable pipe) supplied from farm ponds and creeks





Search for reliable water supplies





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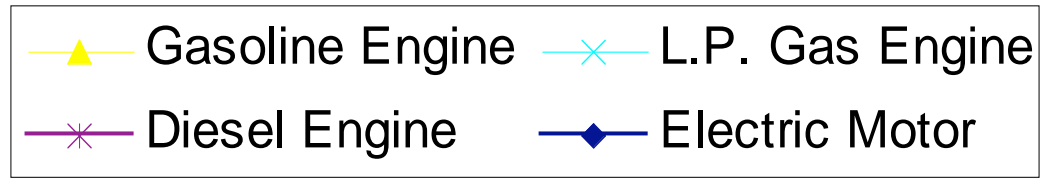
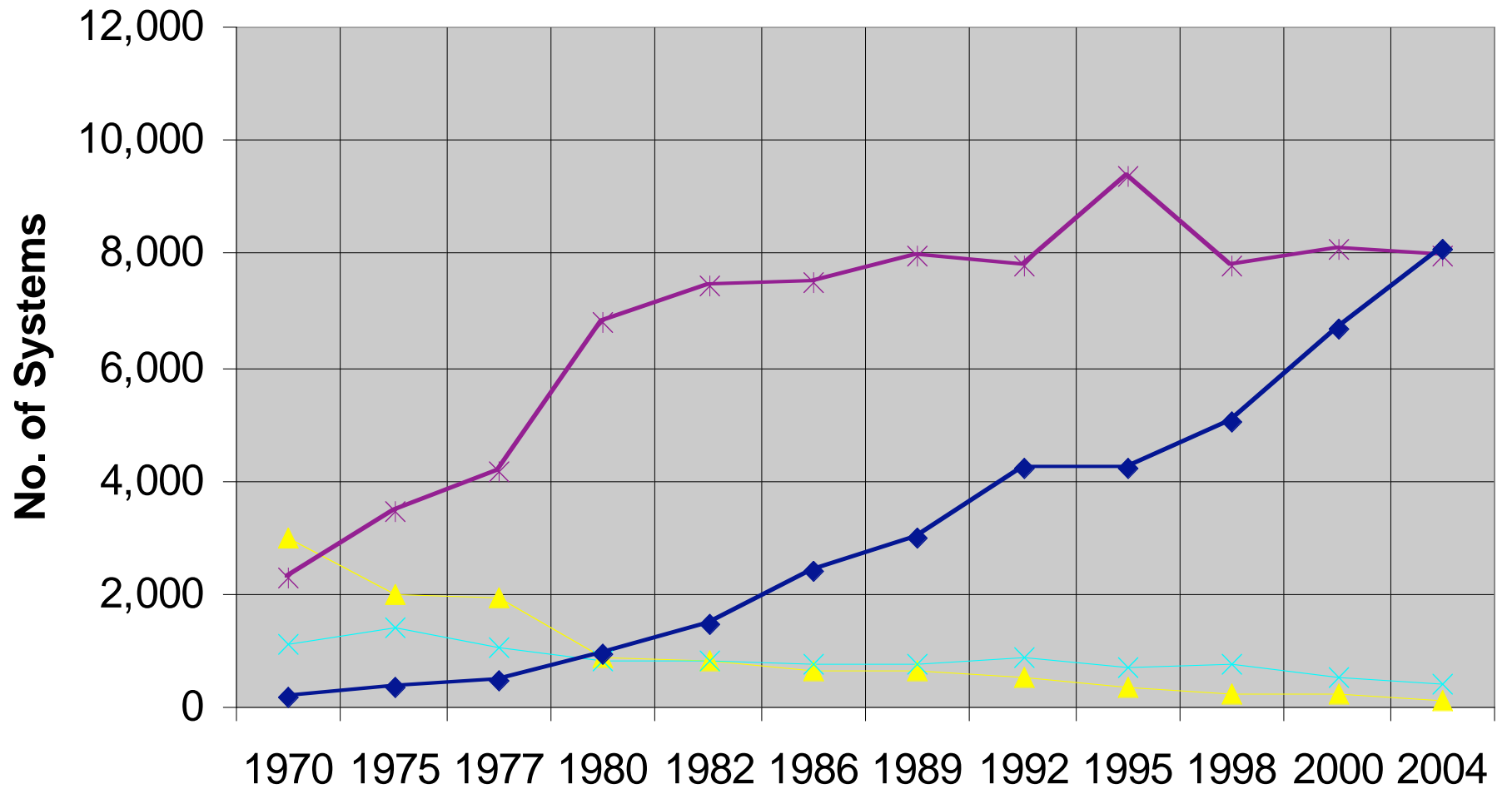
Energy/Water Nexus

- Much of US energy is used to lift, transport, pressurize, and treat water
- Much of US water is used in the extraction, mining, generation, cooling and transfer of energy

Energy for Irrigation

- Irrigator owned fossil fuel engine generators (w/ or w/o direct drive pumps)
- Utility supplied electricity.
- Majority systems require electricity, if only for powering motors and controls moving the system.





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Energy vs water conservation

- Energy costs (i.e. irrigation operating) costs are primary constraint on irrigation
- Farmers conserve water because it reduces pumping costs.
- Few constraints in East on quantities of water withdrawn

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Government's Roles In Georgia's Irrigation

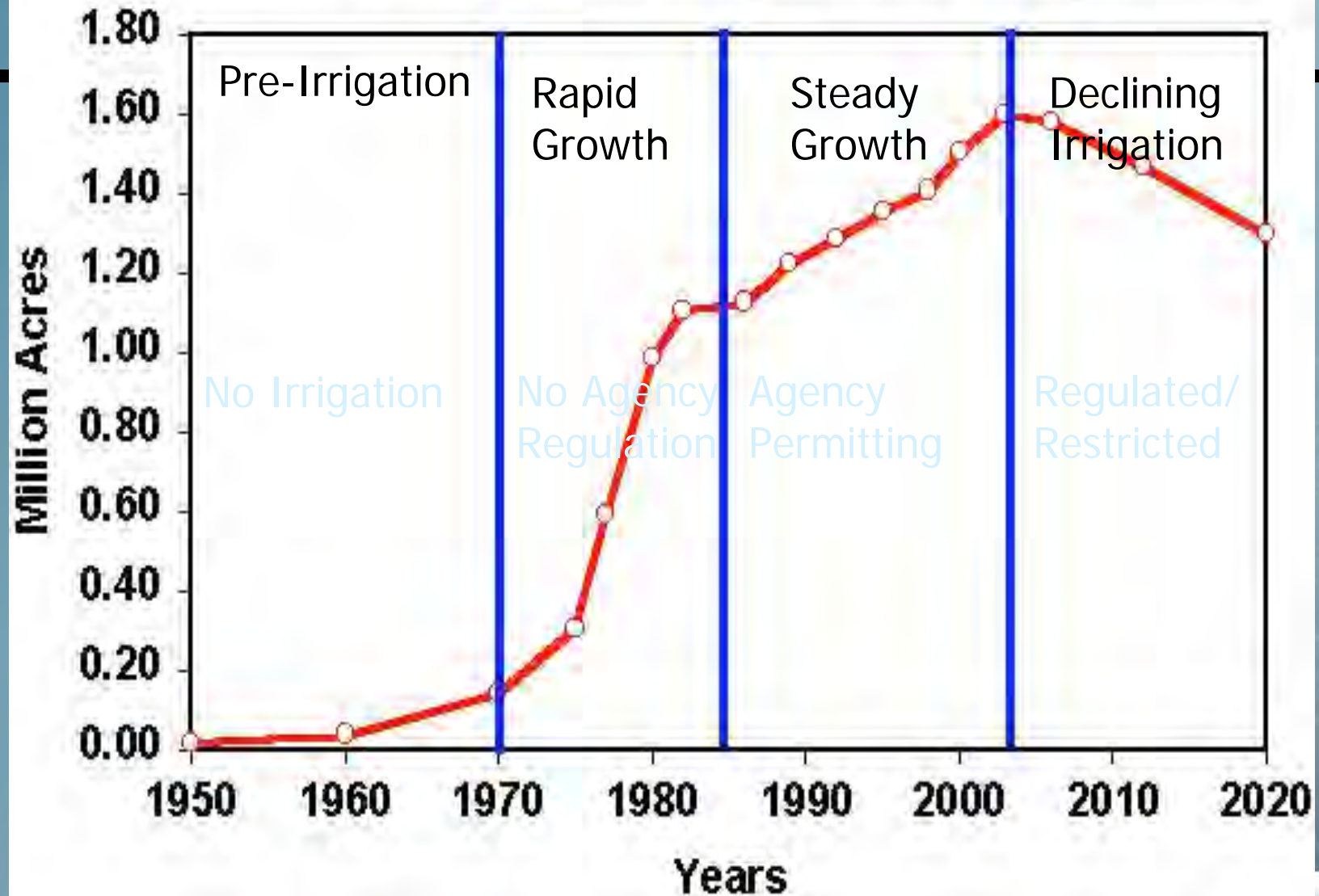
Irrigation in East Unregulated

- Developed **with** minimal government input and minimal constraints
- **No** large water supply dams in east commissioned for irrigation
- **No** canal or pipeline system for deliveries of water to farms.

Irrigation in East Unregulated

- **Individual business decisions**
 - < Numerous attitudes regarding regulation and ownership of water
 - < Efficient but not necessarily orderly
 - < No view of collective impact

Development of Irrigation in Georgia



Irrigation in East Unregulated

- **Pressure is on for regulation**
 - < Interstate battles
 - < Recent non-ag competition for water
 - < Perception Farmers Water to Make Fields Green
 - < Irrigated Agriculture is primary economic engine in rural counties where prevalent.

Irrigation in East Unregulated

- **Pressure is on for regulation**
 - < Permits required
 - < Meters required
 - < Drought restrictions growing
 - < Regional Plans in Flint and Coast
- < **Days of free-wheeling expansion of farm irrigation are limited**

Irrigation in East Unregulated

- Any action that reduces irrigation withdrawals, except conservation results in economic loss



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Water Conservation in Georgia Irrigation

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Irrigation water conservation

- High Pressure big guns, travelers & fixed sprinkler to CP
- High pressure center pivots to low pressure pivots
- (Drip irrigation) primarily allow production of higher value crops
- Precision application pivots



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Future of irrigation in GA (Future of Energy)

Future of Irrigation

- More intensive, less extensive.
- Higher value crops



Future of Irrigation



- Precision application & timing
- 8 to 15% water savings



Future of Irrigation



- Precision timing and remote controls

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Future of Irrigation

- Off stream storage & off-peak water withdrawals.
- Cautious controls on GW withdrawals

Future of Irrigation

- Removal of programs that discourage owner financed conservation improvements.
- Incentives when conservation is economically unfavorable, or when capital for conversion would speed adoption.
- Regulation at the fringes
- Insurance for drought losses



Fuel from farms

- Fuel from plants must be examined in total water and energy
- Forests and crops as diffuse solar collectors
- May be renewable, but at what energy and water balance.
- Could we get in a position where we paid more for corn to convert it to ethanol than hungry nations could afford to purchase it as food to stave off starvation.

Thank you



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- Irrigation metering



Economic multipliers mean few billion annually mostly in rural communities.

Directly tied to utilization of a natural resource - water.



conservation, reduces the
income in the region.



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Irrigation Investments

- **Georgia Farmer Investments, Unlike the Western US**
 - < No COE or BR Regional Reservoirs.
 - < No canals, lift stations, pipelines.
 - < No Subsidized water deliveries
 - < No State or Federal Investments in the Ga Irrigation Infrastructure
 - < No State or Federal Planning, Controls, or Permitting during most of the development of our irrigation infrastructure or in the tapping of the State's water resources



Irrigation: Use of a Natural Resource to Produce Income for Individual and Region

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