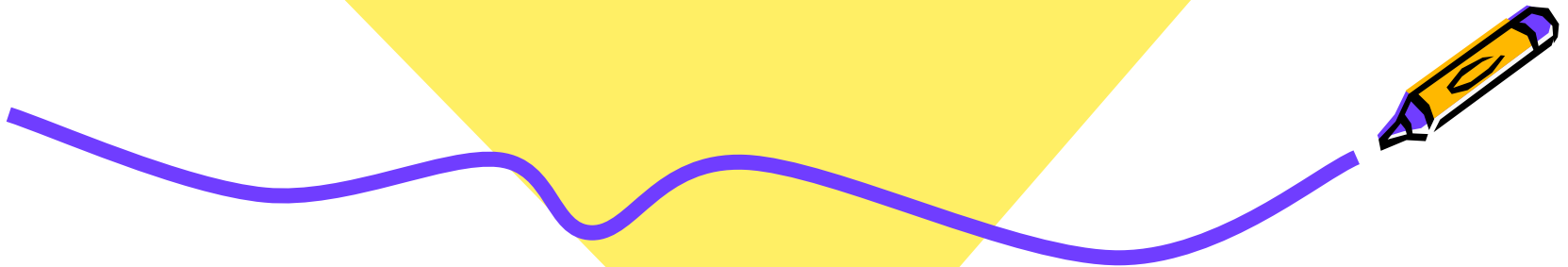




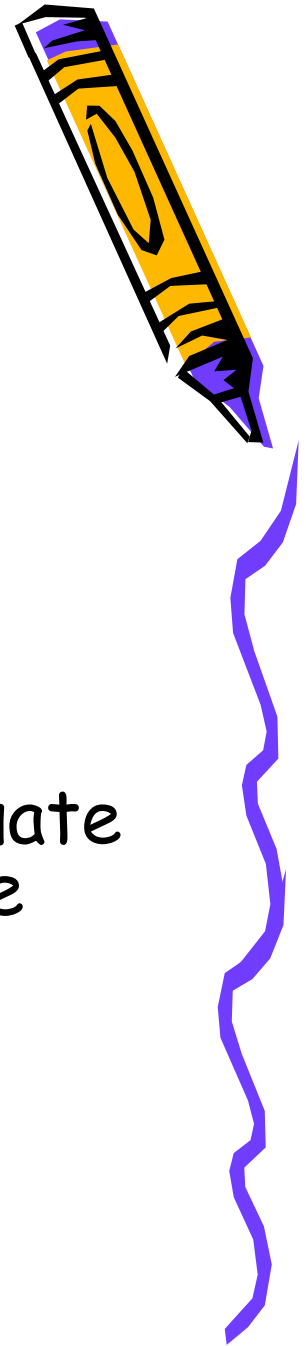
# Allocating Scarce Water

John Freebairn



# Context, Ideals, and Current Situation

- Water is scarce with competing uses
  - Households
  - Industry
  - Irrigation
  - Environment
- Allocate water to different uses to equate marginal social benefits across each use
- Current allocation of water is far from efficient



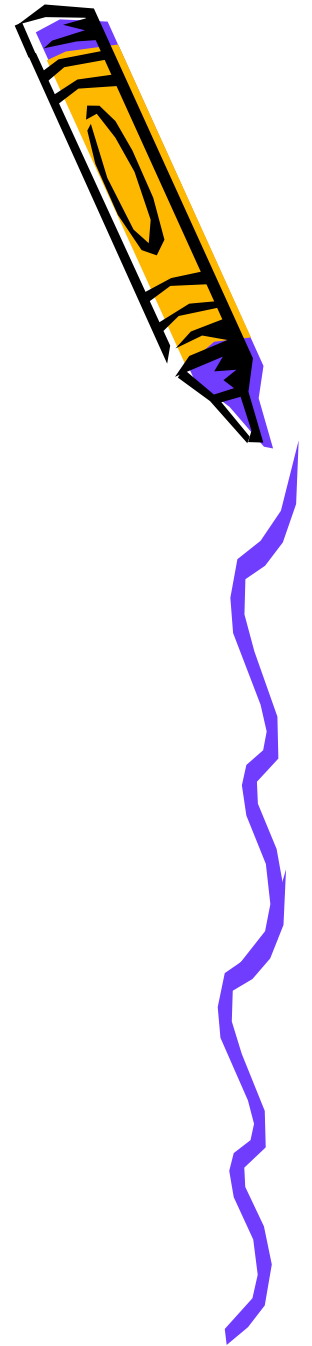
# Water Characteristics and Uses

- Mostly private goods
  - Households
  - Industry
  - Irrigation

Here markets and water prices allocate efficiently

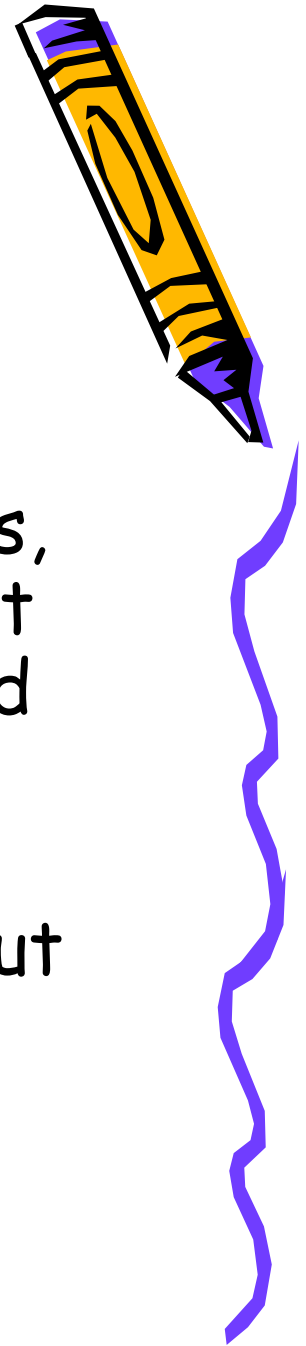
- Mostly public goods
  - Native flora and fauna
  - Heritage

Here markets fail



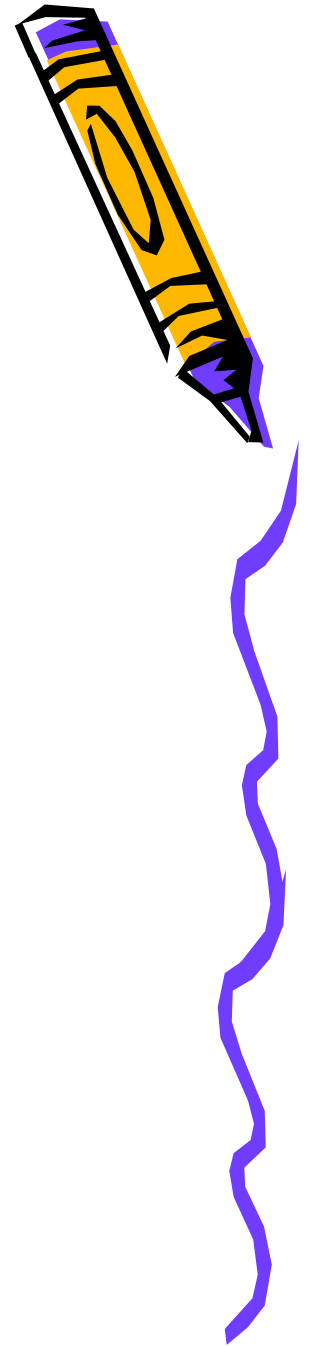
# Institutional and Policy Progress

- Separation of land and water rights
- Markets for temporary water transfers, but excessive restrictions on permanent transfers, transfers across regions, and transfers across user groups
- Recognition of need for government intervention for environmental flows, but rules of intervention still rudimentary



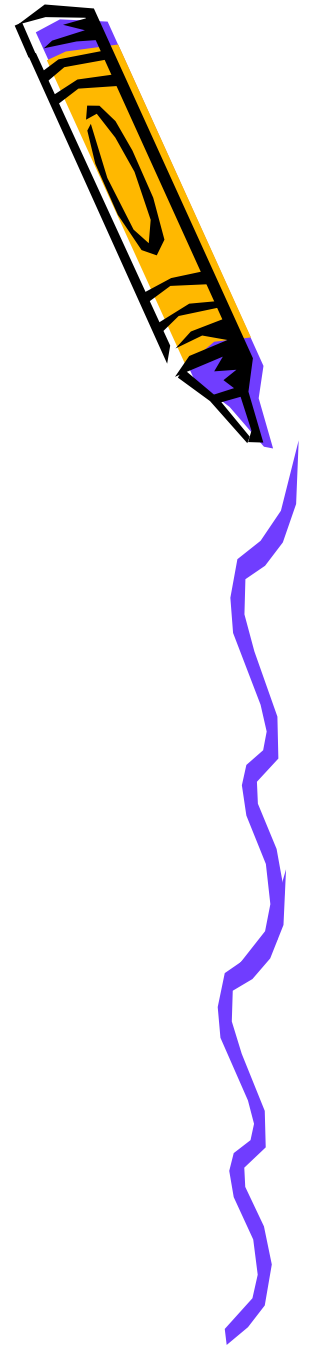
# Water Markets: Some Design Issues

- Water property rights
  - Variability of water supply
  - Grandfather allocation
  - Upstream and downstream
- Water use licences
  - Waste disposal
  - Irrigation external costs
  - Distribution costs and restrictions



# Water Markets: Operation

- Mutually beneficial trades
  - Flows
  - Stocks
- Reallocation to more valuable uses
  - Static
  - Response to changing circumstances
- Incentives to improve efficiency
- Framework for future technological development



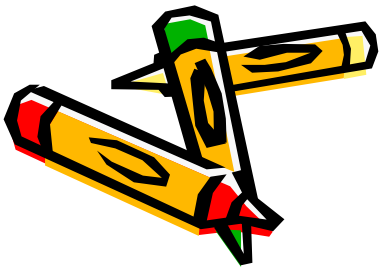
# Environmental Flows: Framework

- A means to provide valued services
- Subject to declining marginal benefits
- Ideally want to equate marginal benefits with the market water price
- Requires data on:
  - The effects of different flows on changes in flora and fauna
  - Estimates of the value to society of marginal changes in the supply of flora and fauna



# Environmental Flows: Practice

- Options on how to acquire more water:
  - Purchase water rights
  - Regulate to reduce water available per water right
  - Supply expansion
- Changes over time in allocation:
  - Rising incomes
  - More knowledge





# Conclusions

- Choices to allocate limited water among different uses. Equate marginal social benefits.
- Water markets with well defined property rights fine for most household, industry and irrigation uses.
- Government intervention for many environmental services. Data on extra biodiversity, and society valuations

