

# Water Use in Hawaii

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# Overview of Presentation

- Overview of the USGS's National Water-Use Information Program
- Sources of water-use data
- Limitations of the data
- What do the data show?
- What can be done to improve water-use information?

# USGS National Water-Use Information Program

- The program is responsible for compiling and disseminating the Nation's water-use data
- Every 5 years, water-use information is compiled at the county level
- State-level data are published in a national circular, which is the most requested USGS publication

# Goals of the USGS National Water-Use Program

- **Analyze source, use, and disposition of water at local, state, and national levels (Water Census)**
- Reply to water-use information requests from the public
- Document trends in water use in the United States
- Cooperate with state and local agencies on projects of special interest
- Develop national water-use database
- Publish local, state, and national water-use data reports

# Sources of Water

- Groundwater
  - Fresh
  - Saline (dissolved solids greater than or equal to 1,000 mg/L)
- Surface Water
  - Fresh
  - Saline

# Water-Use Categories



**Irrigation**



**Public & Domestic Water Supply**



**Mining**



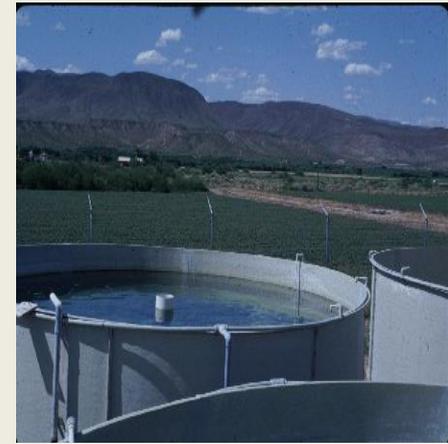
**Thermoelectric Power**



**Industrial & Commercial**



**Livestock**

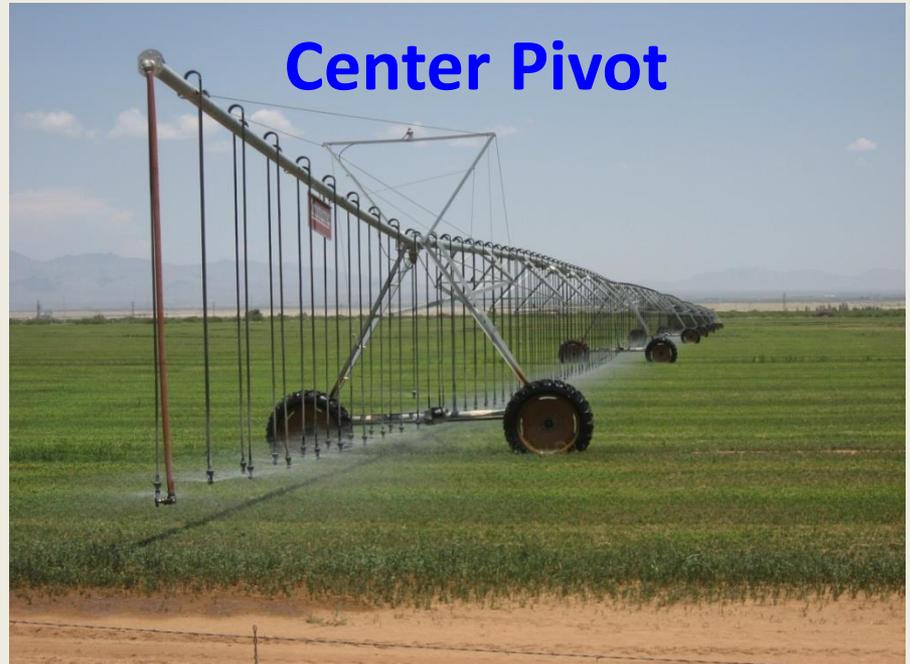


**Aquaculture**

**Flood Irrigation**



**Center Pivot**



**Surface Drip System**



**Sprinkler System**



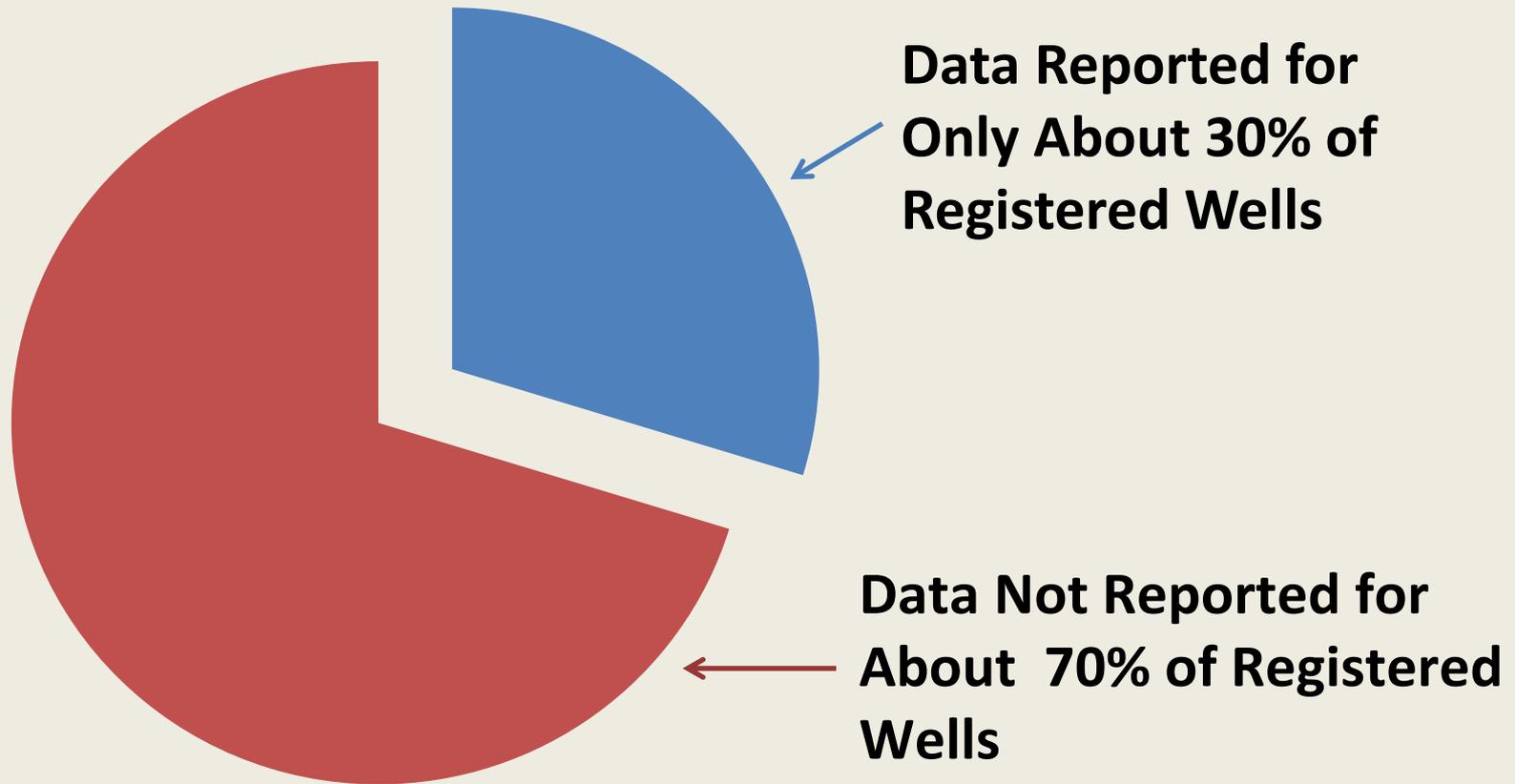
# Sources of Water-Use Data

- Commission on Water Resource Management
  - Groundwater pumpage
  - Surface-water diversions
- Department of Agriculture
- County water departments
- National data sets
  - Mining
  - Power production

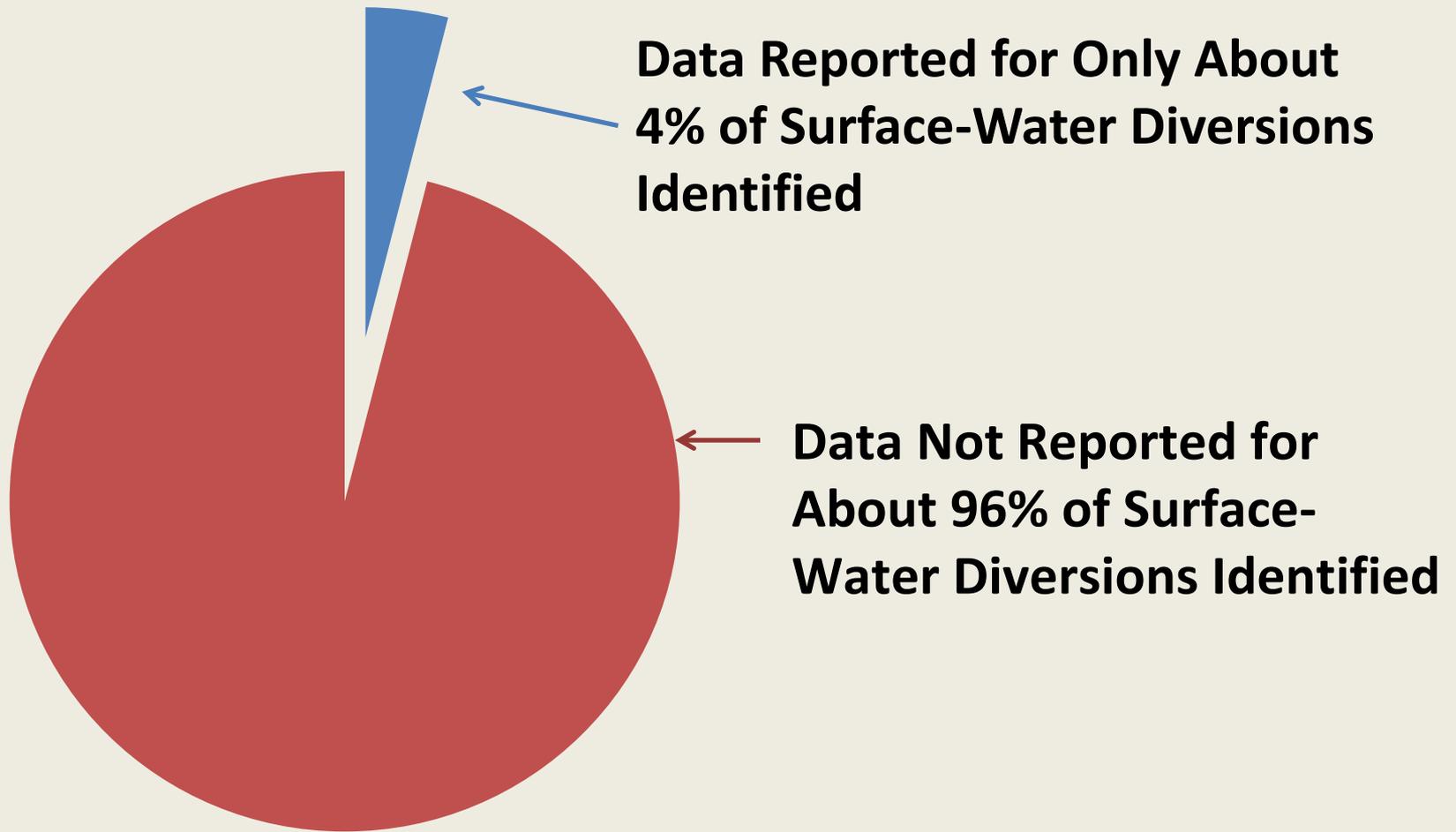
# Limitations of the Data

- Incomplete reporting of pumpage and surface-water diversions
- Use of water often unknown
- Changes in methods used to estimate missing data

# Incomplete Groundwater Pumpage Reporting



# Incomplete Surface-Water Diversion Reporting



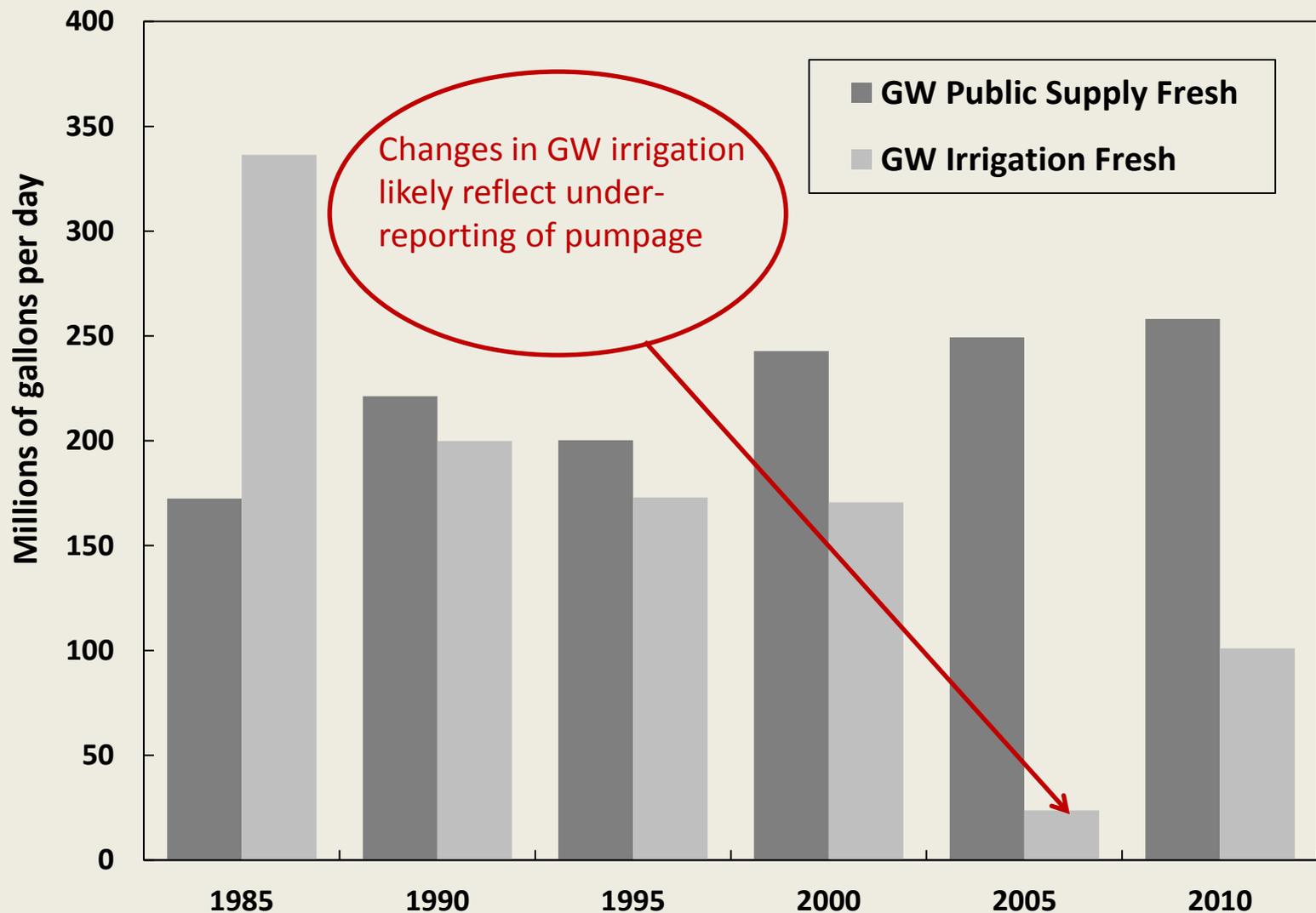
**Data Reported for Only About 4% of Surface-Water Diversions Identified**

**Data Not Reported for About 96% of Surface-Water Diversions Identified**

# Reported Diversion Data

- About 1,260 diversions identified through mapping of registered (pre-1990) and permitted (post-1990) diversions
- Not sure how many of these diversions are active
- Data reported on only 50 diversions
  - Kauai - 7 diversions
  - Oahu - 2 diversions
  - Maui - 39 diversions
  - Big Island - 2 diversions

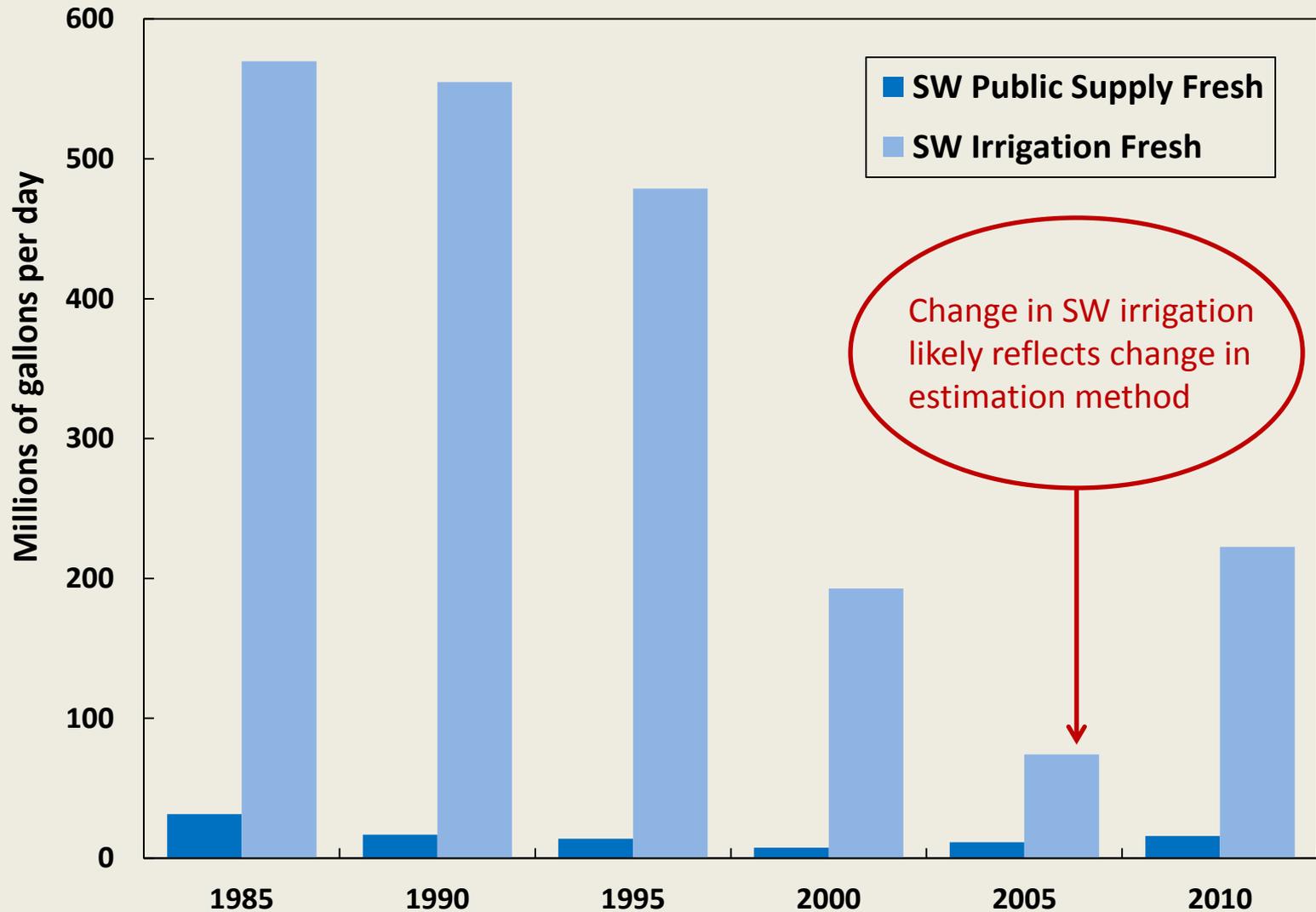
# Groundwater Public Supply and Irrigation Water Use for the State of Hawaii



# Limitations of the Data

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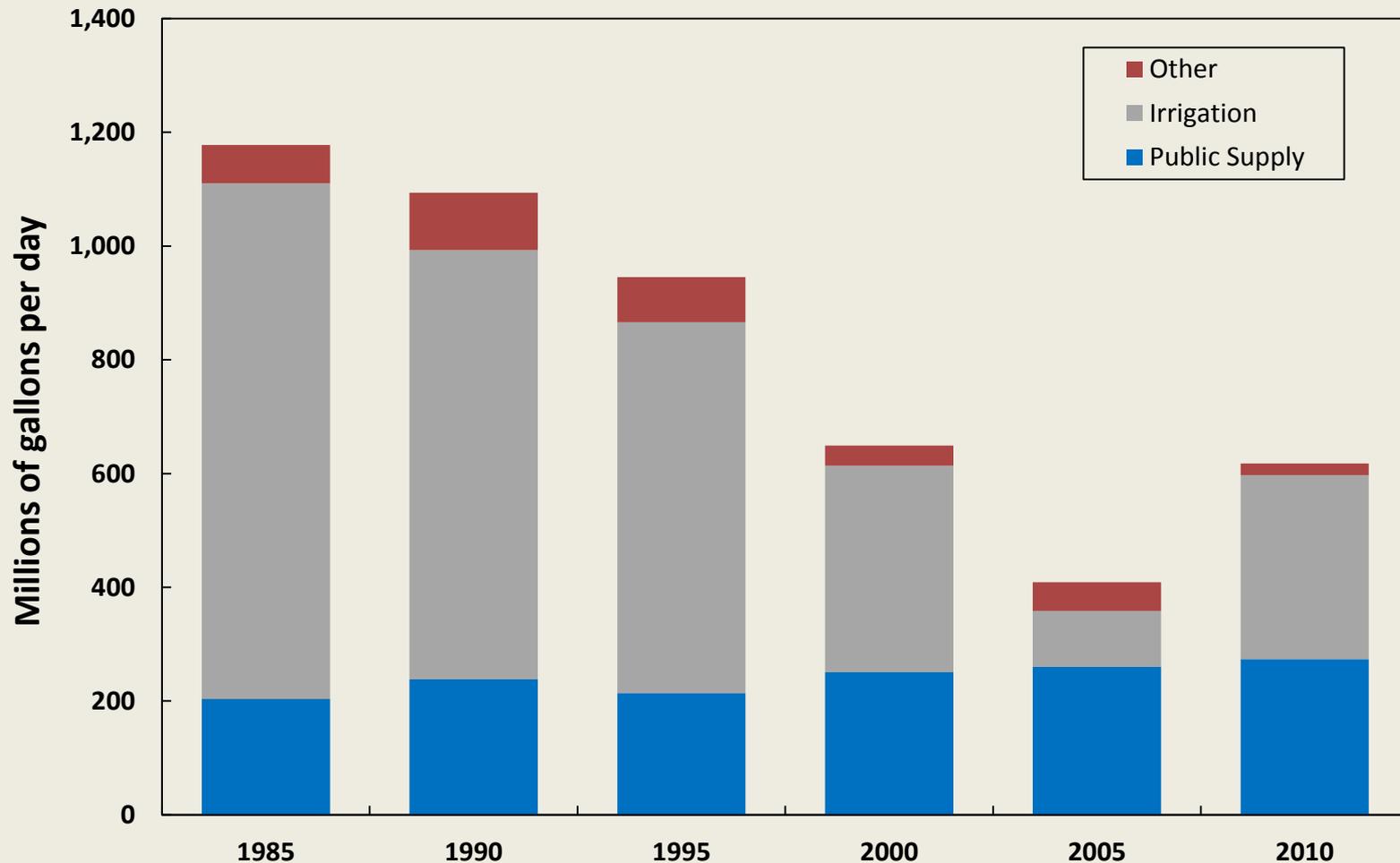
# Surface Water Public Supply and Irrigation Water Use for the State of Hawaii



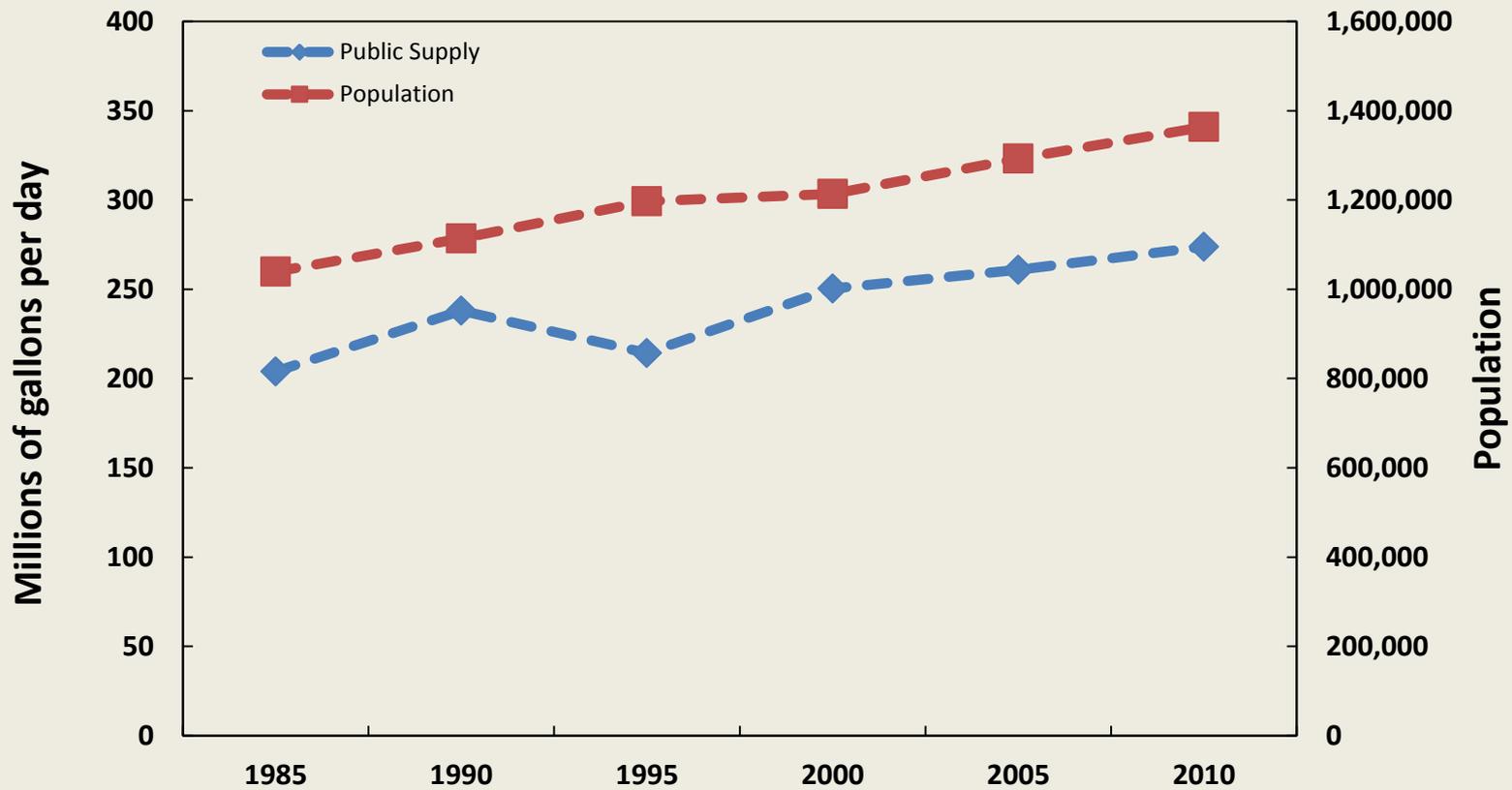
# What Do the Data Show?

- Primary uses of fresh water are public supply and irrigation
- Public-supply use increased as population increased
- Irrigation water use changed the most in the state

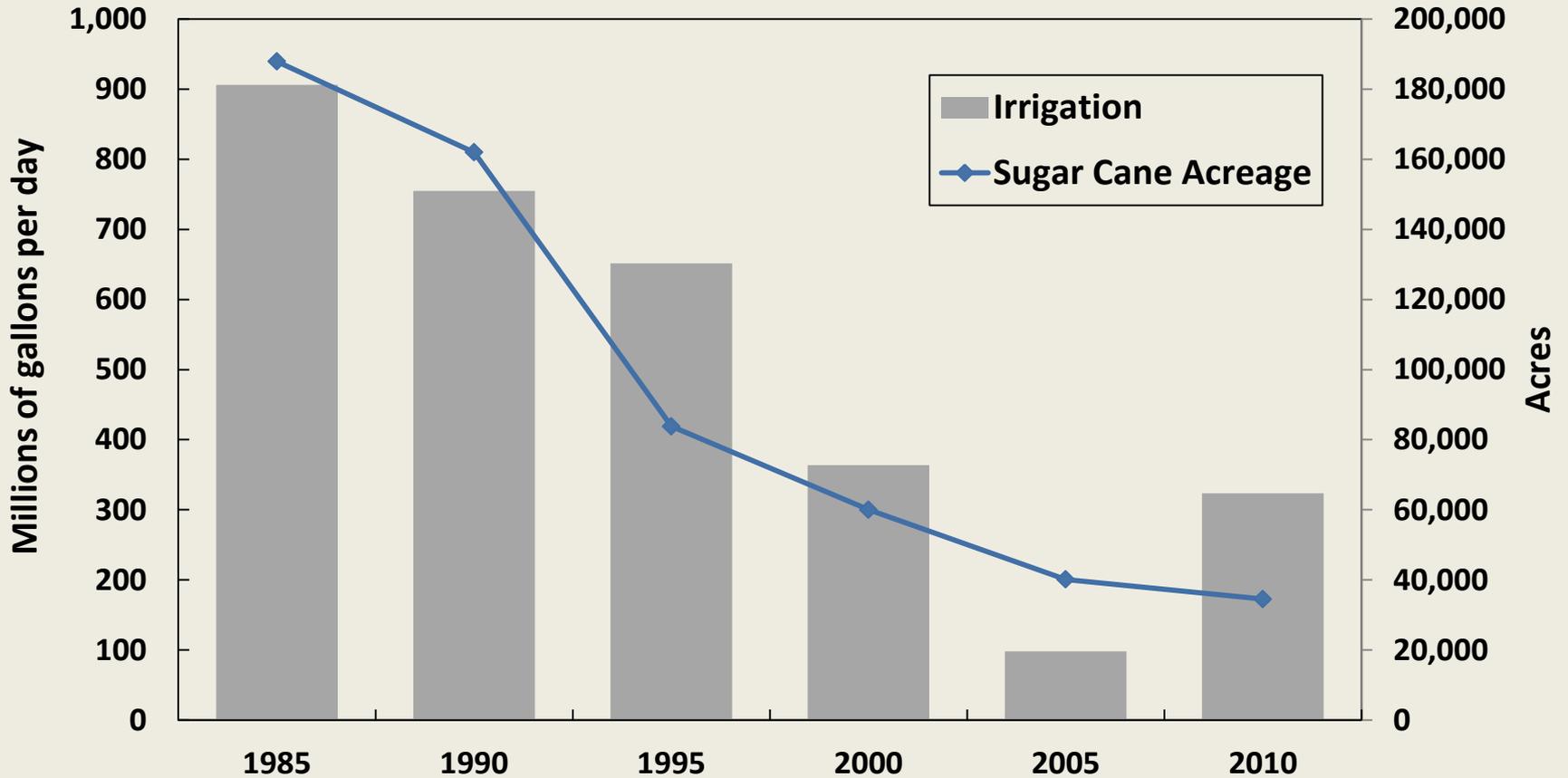
# Fresh Water Use for the State of Hawaii



# Public Water Supply Use Increased As Population Increased



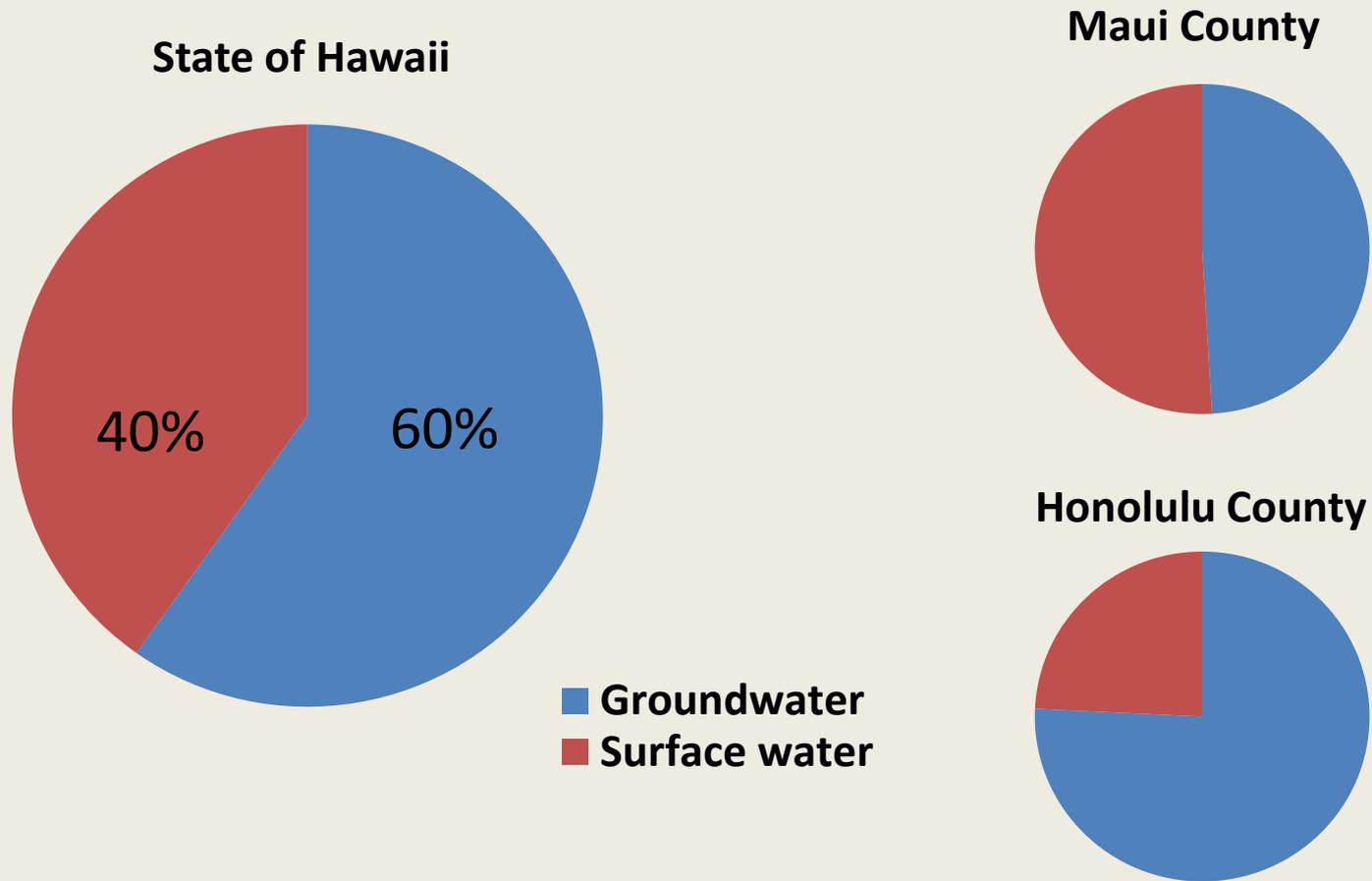
# Irrigation Water Use Changed the Most



# What Do the Data Show? (continued)

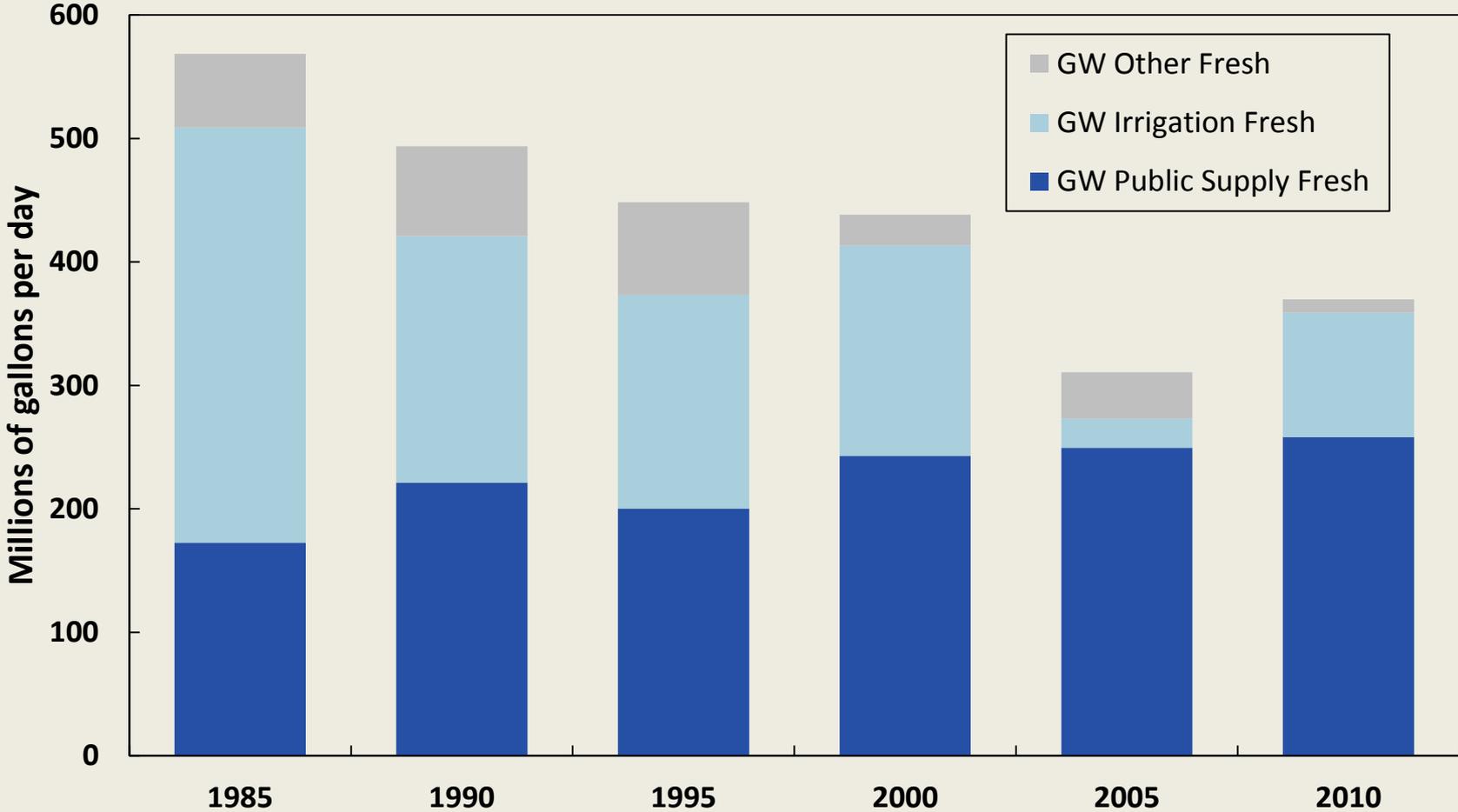
- GW is the dominant source of fresh water for Honolulu and Hawaii counties
- GW is currently used primarily for public supply
- SW is used primarily for irrigation

# Source of Fresh Water in 2010

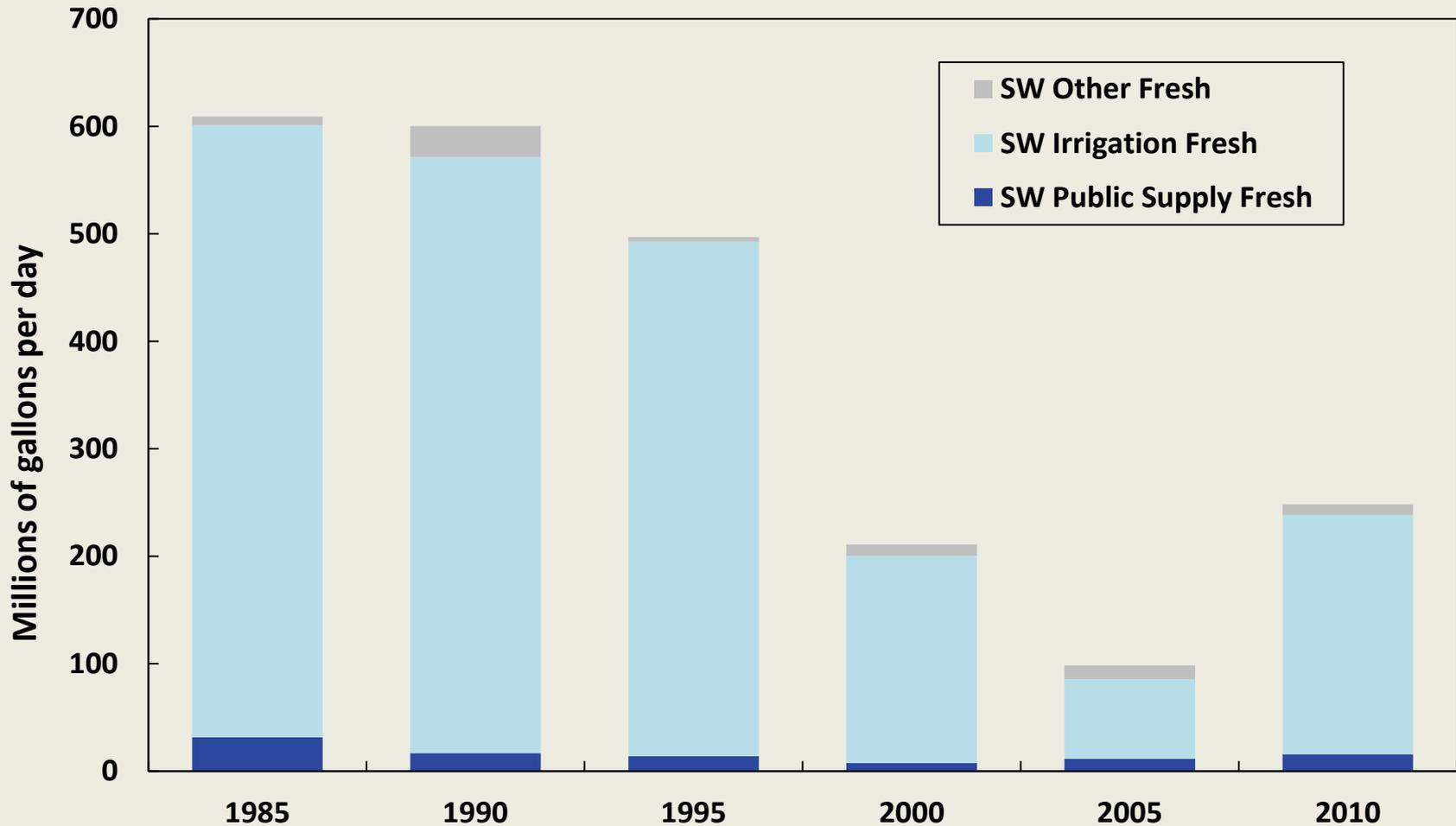


Note: Data affected by incomplete reporting and unverified estimation method

# Groundwater Currently Used Primarily for Public Supply



# Surface Water Used Primarily for Irrigation



# What Can Be Done to Improve Data?

- Identify all points of groundwater withdrawal and surface-water diversion
- Improve reporting of withdrawals and surface-water diversions (CWRM online database)
- Require reporting of how water is used (crop irrigation, dust control, pest control, washing)
- Implement consistent method to estimate missing data

# Summary of Groundwater Findings

- GW Withdrawal
  - Reporting by large users (public, military, other) generally complete
  - Large users account for most of GW withdrawal
  - Reporting by small users generally incomplete or not required, but CWRM taking steps to improve with on-line reporting
- GW Use
  - Currently used mainly for public supply
  - On-line form does not require information on how water is used, but could be included in subsequent versions

# Summary of Surface-Water Findings

- SW Diversions
  - Reporting generally incomplete for irrigation, particularly for small users
- SW Use
  - SW use primarily categorized as irrigation
  - But large uncertainty in how irrigation water is used
  - SW use for public supply generally small and well documented