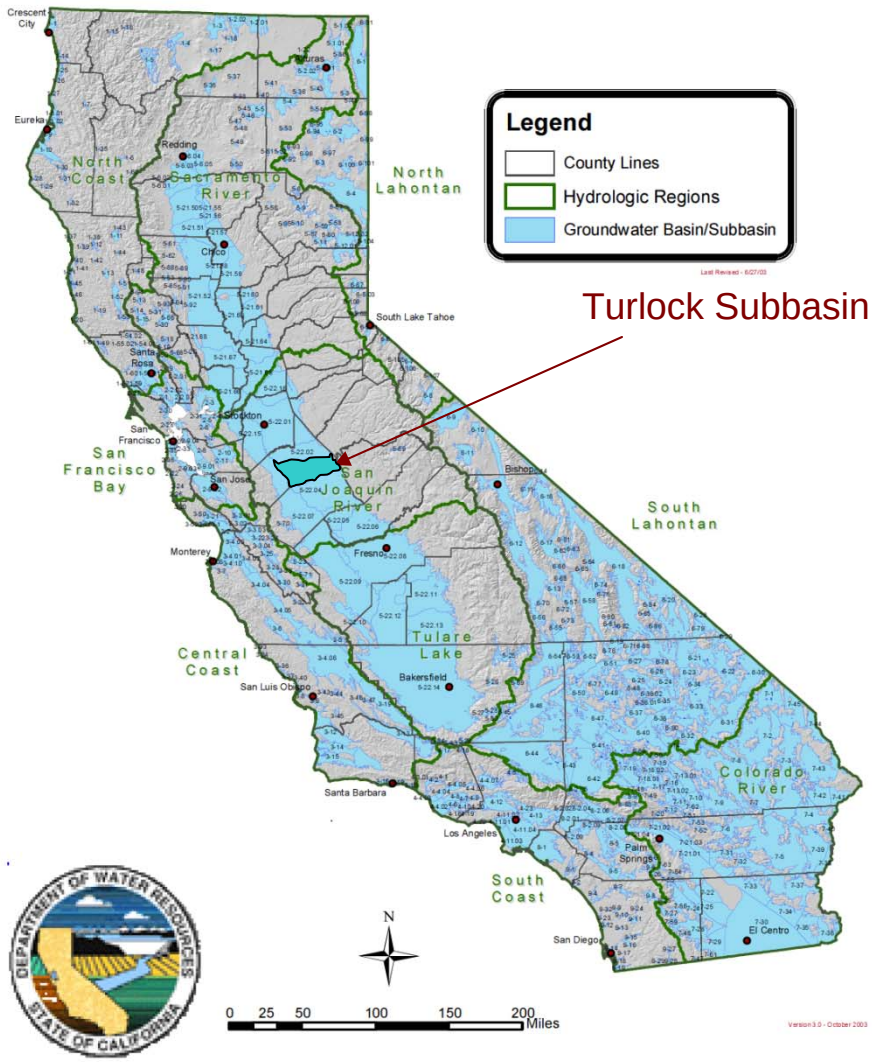
Turlock Groundwater Basin:
A Presentation to the Ag Advisory Board

September 9, 2013

Groundwater in California

Groundwater Basins in California



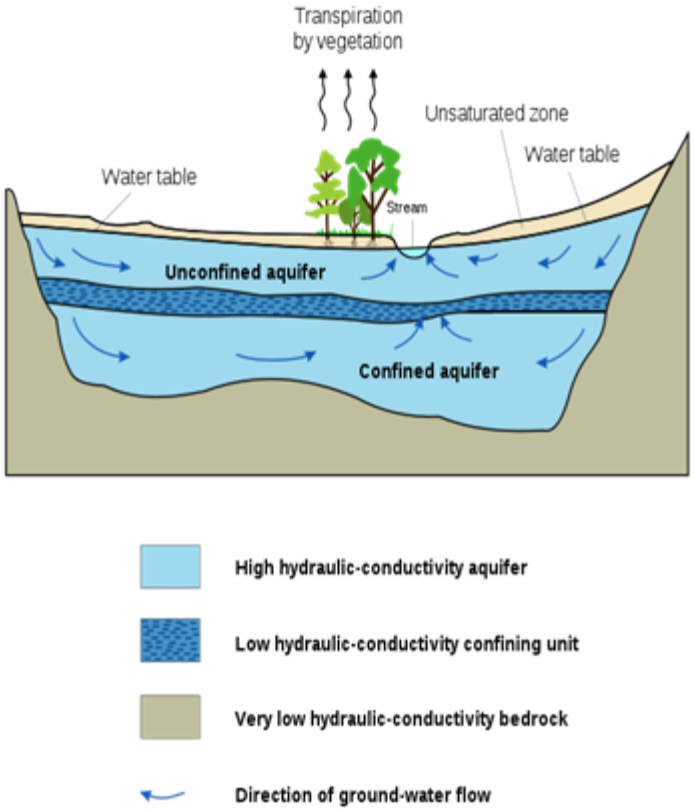
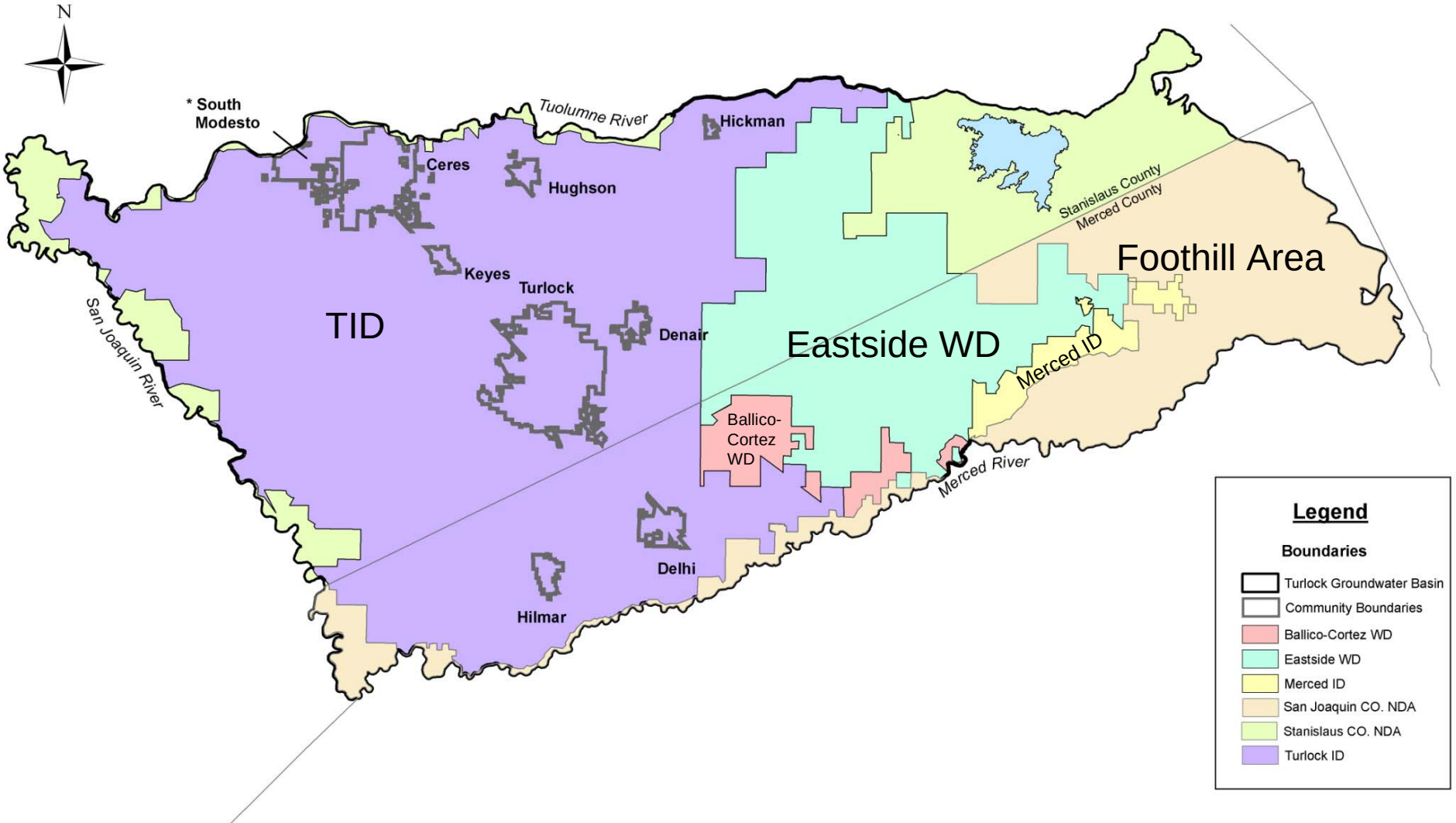


Figure courtesy of The Groundwater Foundation

Map modified version of a Department of Water Resources figure from Bulletin 118

Turlock Subbasin Boundaries & Local Agencies

- Bounded by local rivers and the Sierra Nevada Foothills
- Occupies portions of Stanislaus and Merced Counties



Agencies within the Basin

- **Agricultural Users**
  - Turlock Irrigation District
  - Merced Irrigation District
  - Eastside Water District
  - Ballico-Cortez Water District
- **Other Agencies**
  - Merced County
  - Stanislaus County
- **Municipal Users**
  - City of Ceres
  - City of Turlock
  - City of Hughson
  - City of Modesto
  - Hilmar County Water District
  - Delhi County Water District
  - Denair Community Services District
  - Keyes Community Services District
  - Ballico Community Services District

Groundwater is a Shared Resource

- All agencies rely upon groundwater for their water supply to some extent
- Groundwater and Surface Water used conjunctively within the Turlock and Merced IDs
  - Maximize use of surface water for irrigation
  - Districts and growers supplement SW deliveries with GW
- Groundwater is the <u>only</u> supply for:
  - M&I uses
    - Communities, rural residences, manufacturing & industry, etc.
  - All agricultural lands outside of TID and Merced ID

Turlock Groundwater Basin Association

- Formed in 1995
- Local Ag, urban and county agencies, working together
  - Conducted studies
  - GW Mgmt. Plan in 1997. Updated in 2008.
  - Gained an understanding of the groundwater system, and coordinated management activities

TGBA Activities

- Two "Water Balance" studies (2003 and 2008)
  - 2003 - Although GW levels had declined during the drought, they appeared to have "stabilized"
    - Only one dry year between 1993 & 2002
    - Irrigation improvements ⟶ reduced runoff and improved efficiency
    - Slight increase in groundwater pumping offset by decreased groundwater discharges to the river system
  - 2008 – Revision showed slight decline
    - 1993-1996 Storage estimates: increased 70,000 AF/yr or 280,000 AF
    - 1997-2006 Storage estimates: decreased 21,500 AF/yr or 215,000 AF

TGBA Activities (continued)

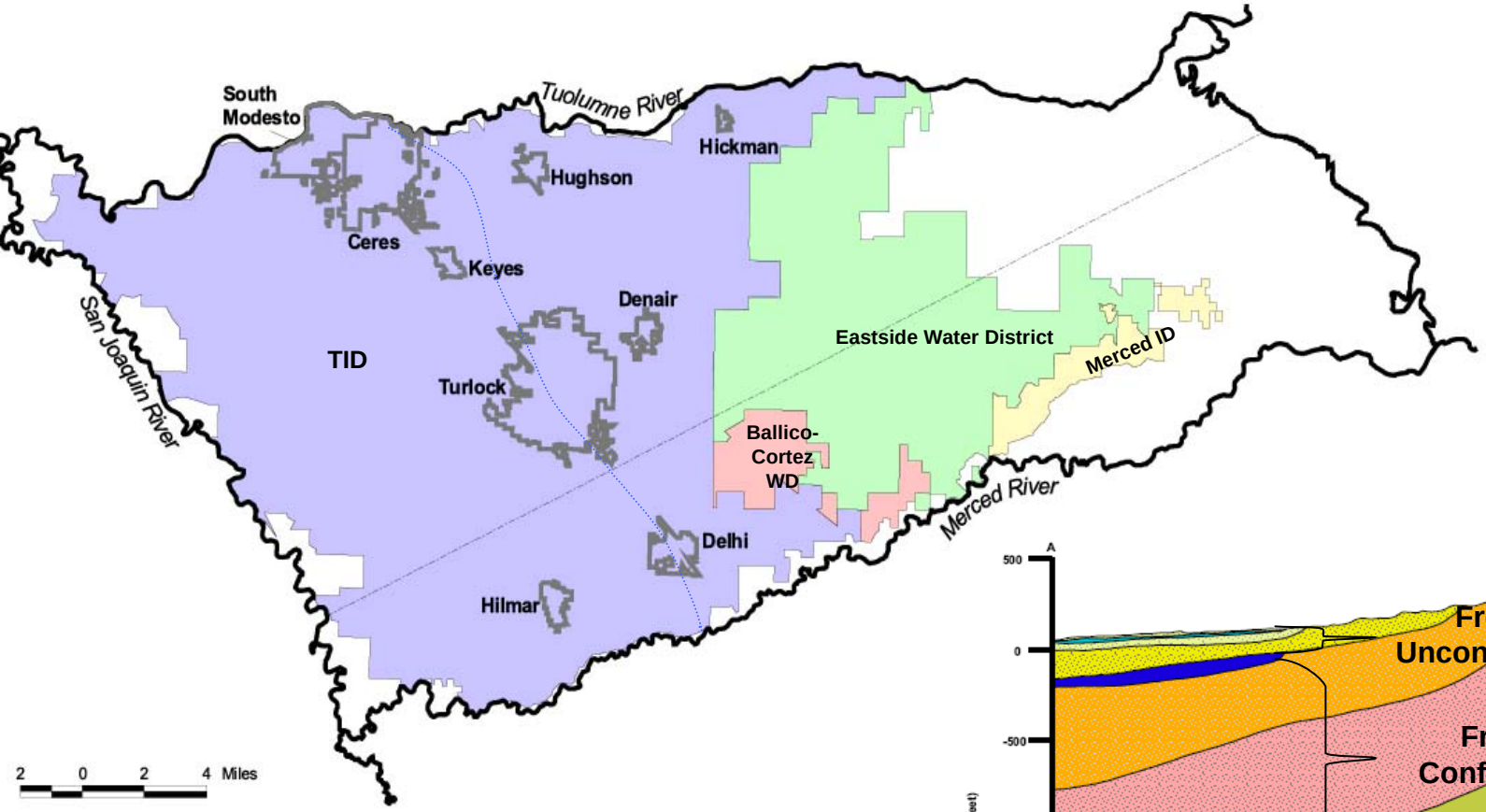
- "Future Land Use Study" (2008)
  - Evaluated future impacts of land use changes on water supplies
  - Intended to provide a standardized basis for Urban Water Supply analyses and other planning activities
  - Found information was lacking on far eastern side where additional Ag development is occurring

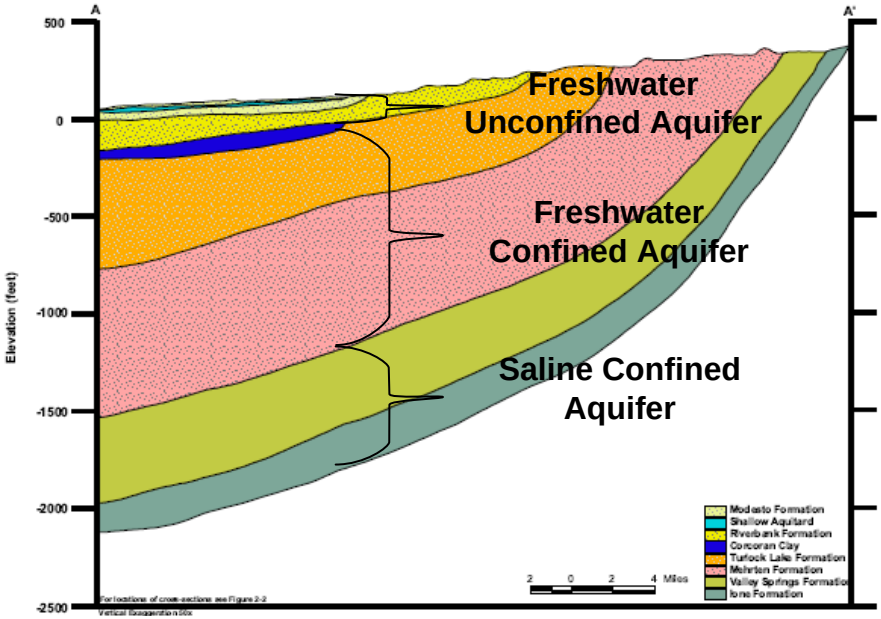
TGBA Activities (continued)

- TGBA LGA Grant 2013
  - Fill in data gaps on eastern side of Basin
    - Hydrogeology
    - Identify wells and potential water level monitoring sites
  - Rerun the Future Land Use analysis
  - Received Grant – Expect to be completed in Fall 2015

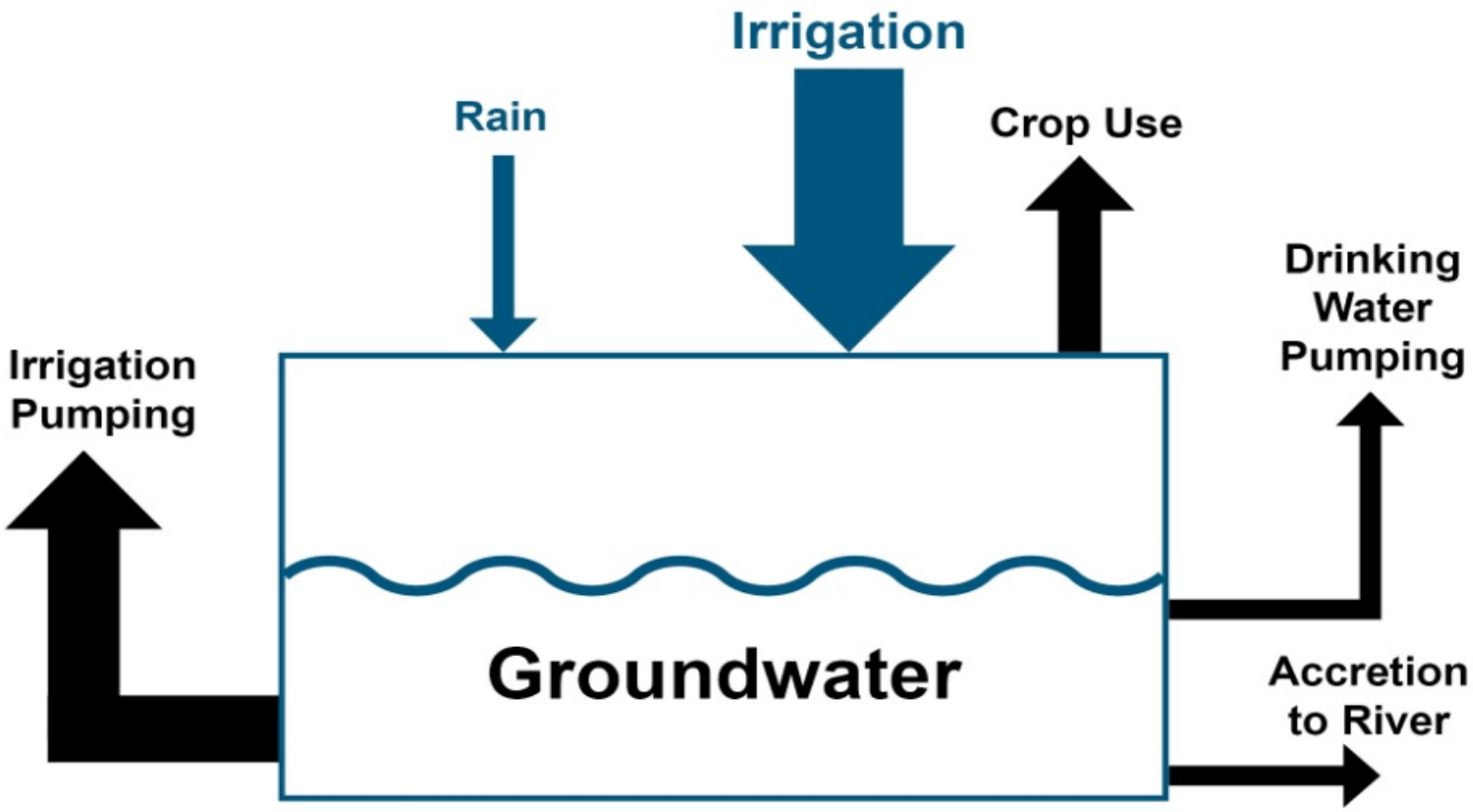
- Ongoing Implementation/Coordination Activities
  - Semi-annual groundwater level monitoring
  - Groundwater quality monitoring

Geology & Hydrogeology



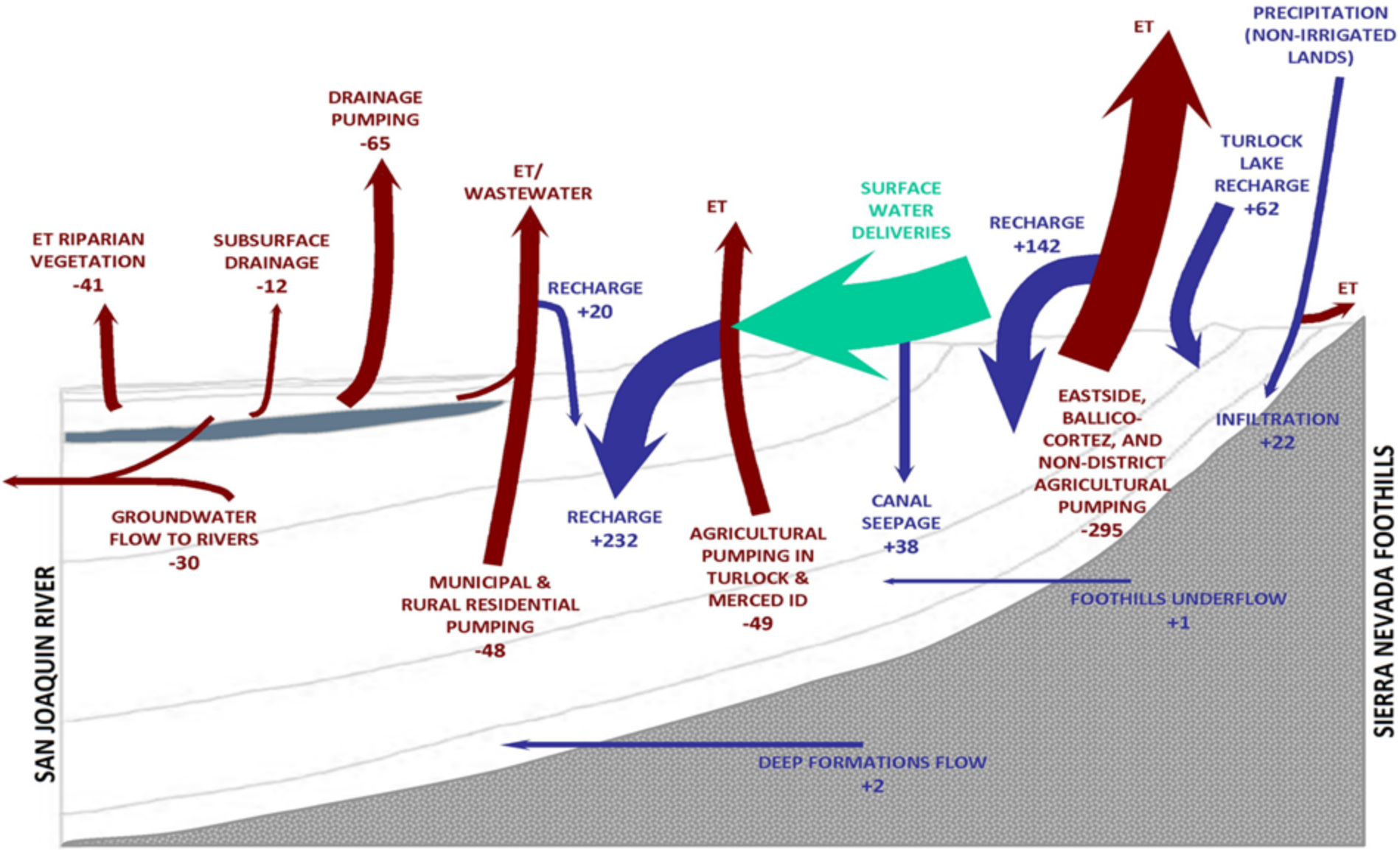


Simplistic Model – Groundwater "System"

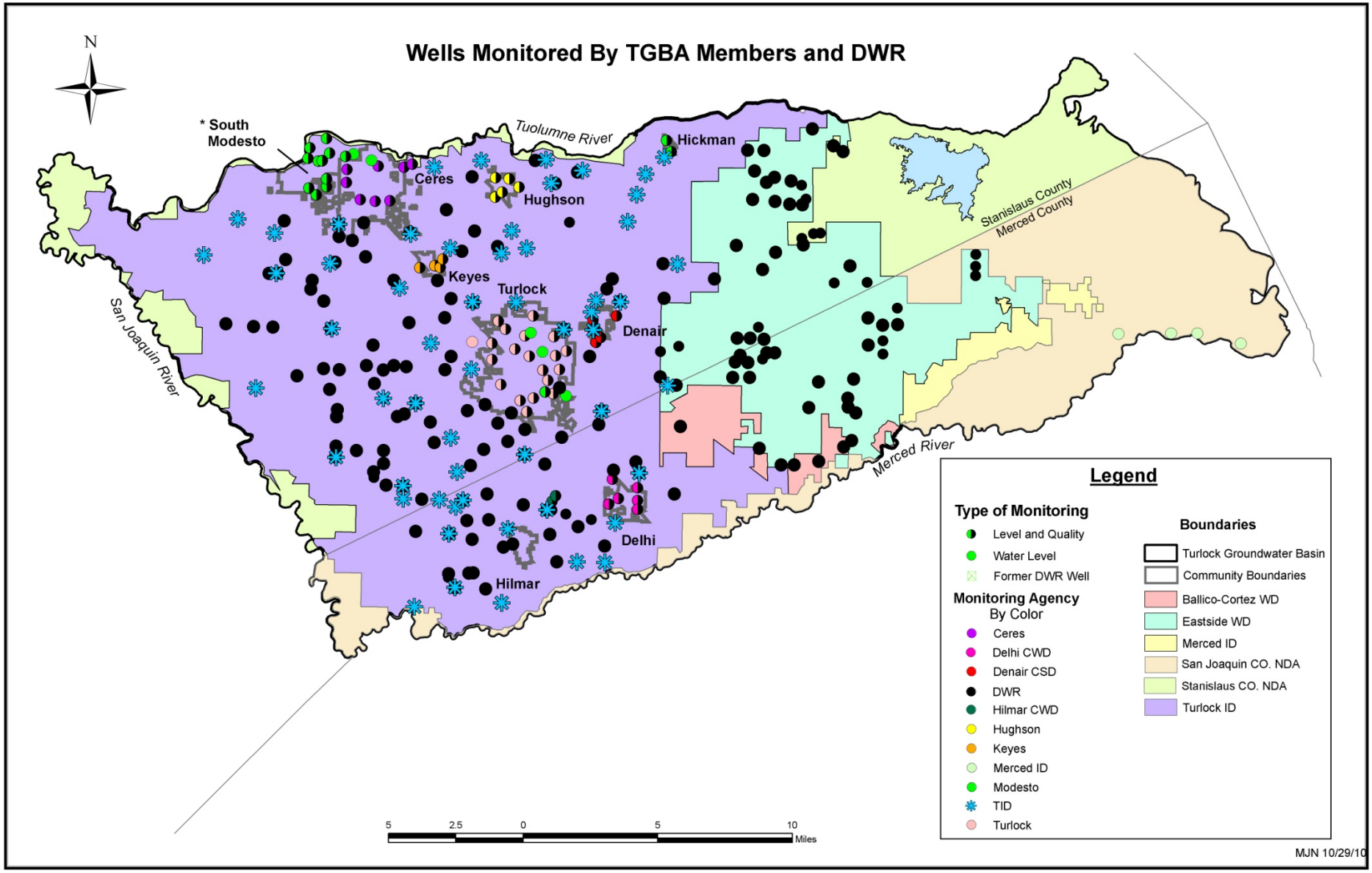


1997-2006 Water Budget

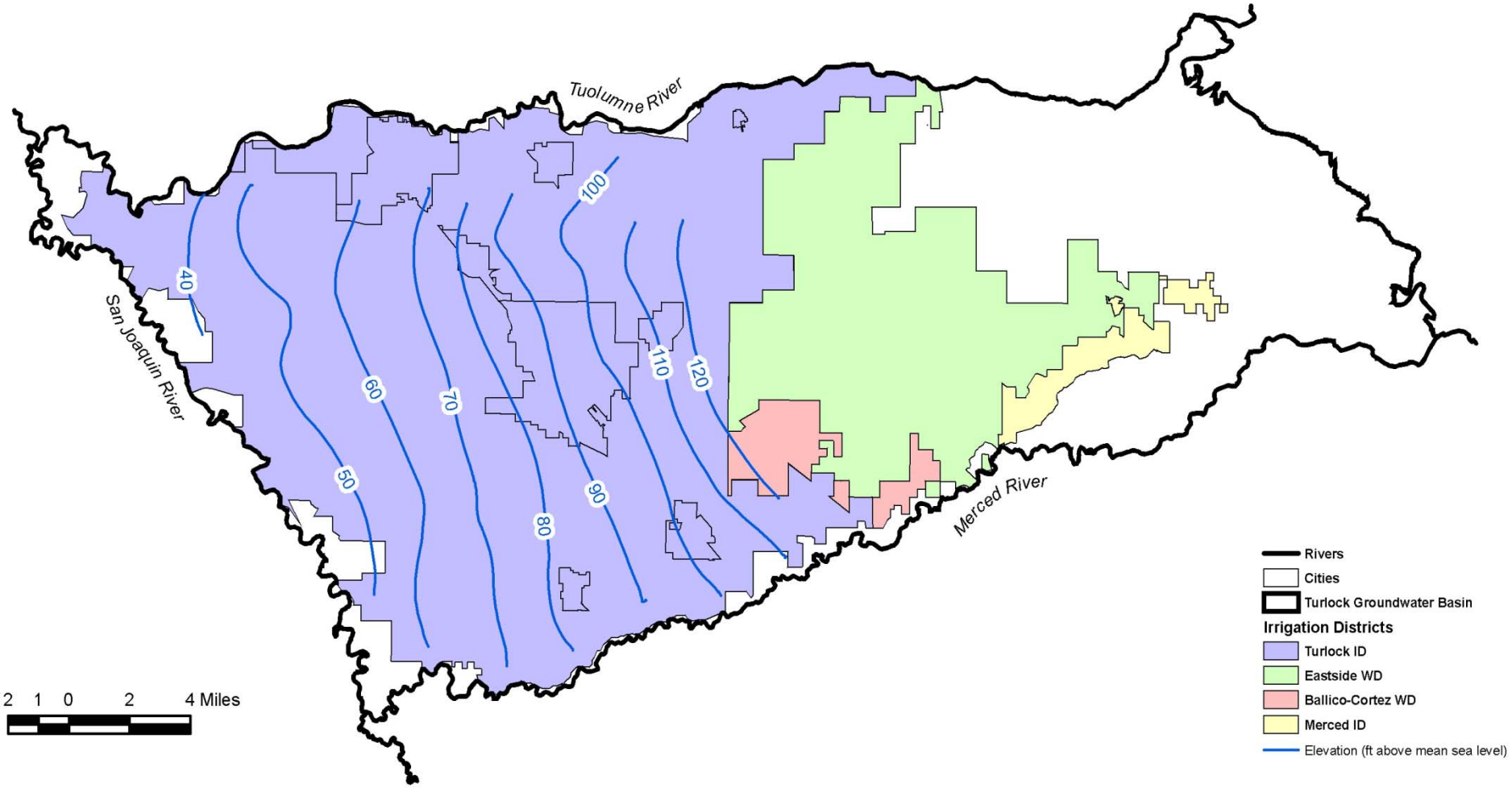
– all values in thousands of acre-feet –



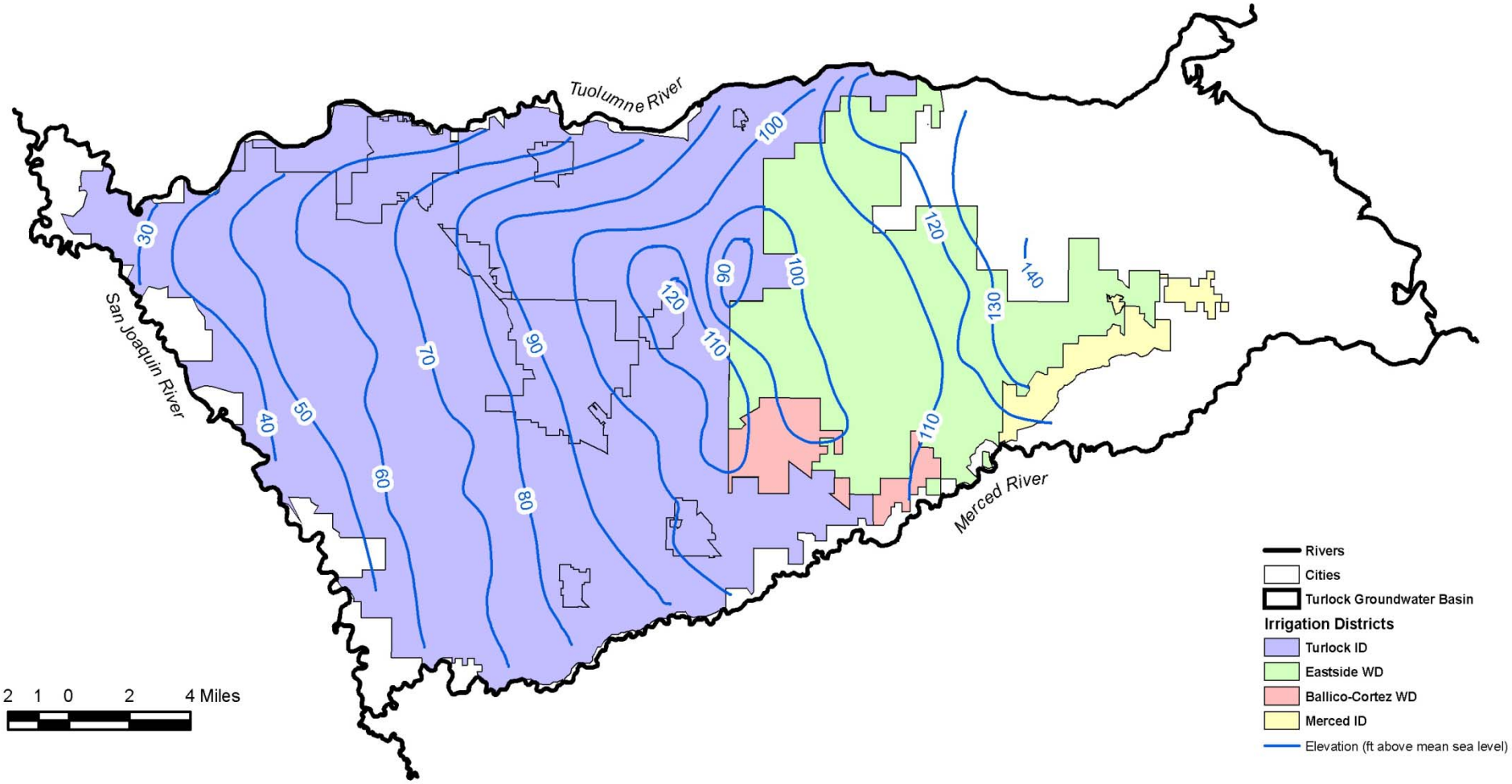
Monitoring Sites



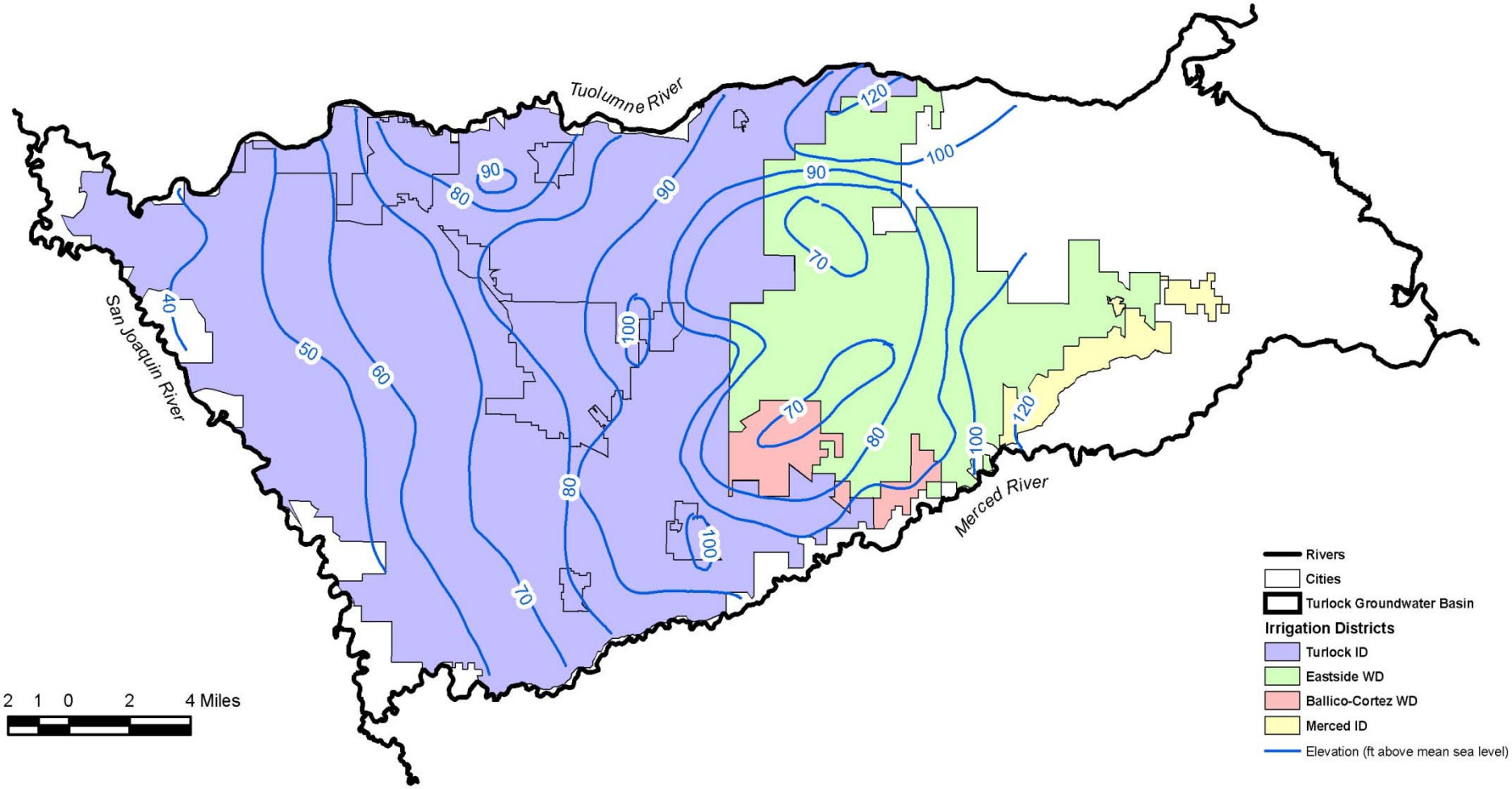
Groundwater Levels – 1960



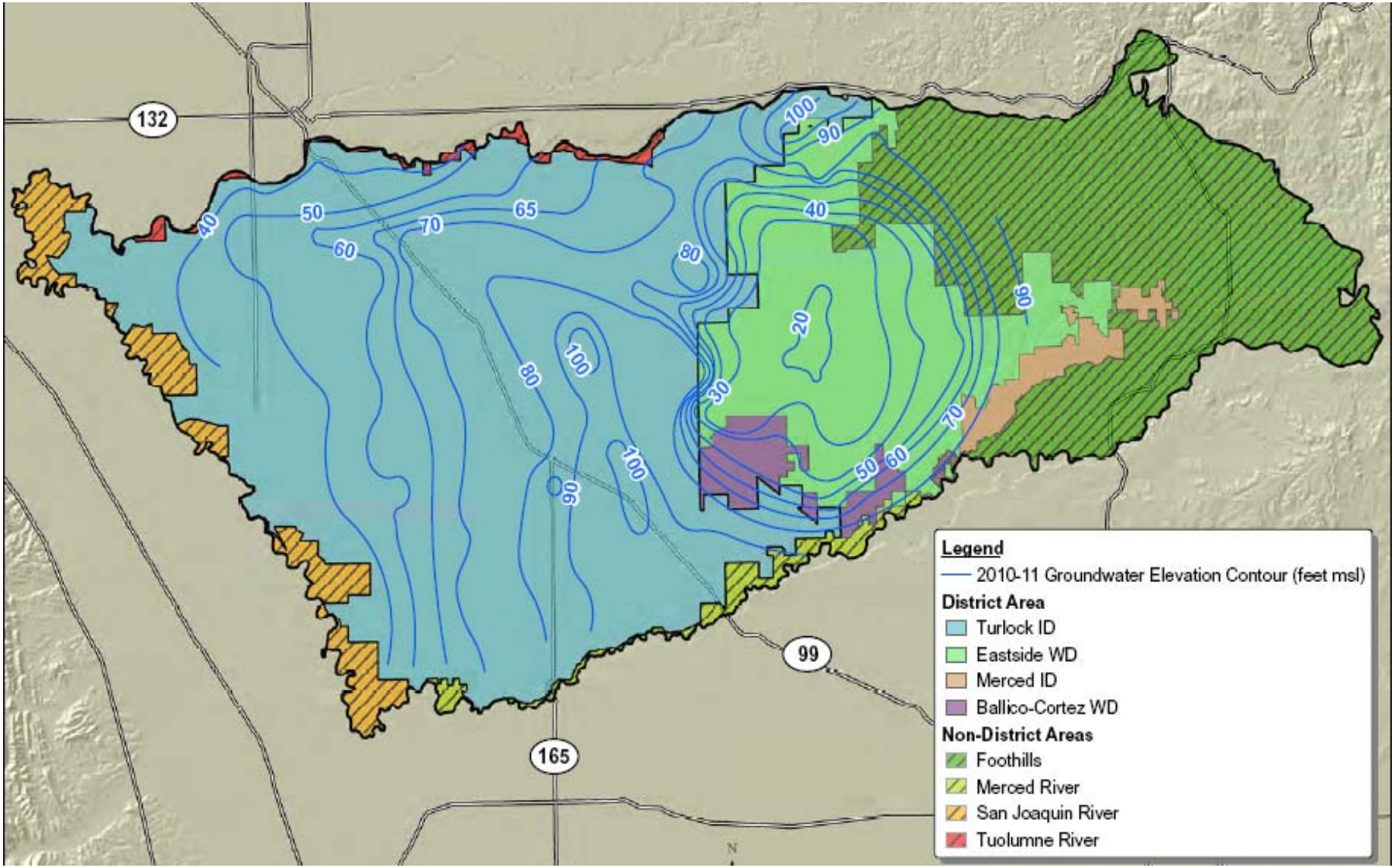
Groundwater Elevations – 1974



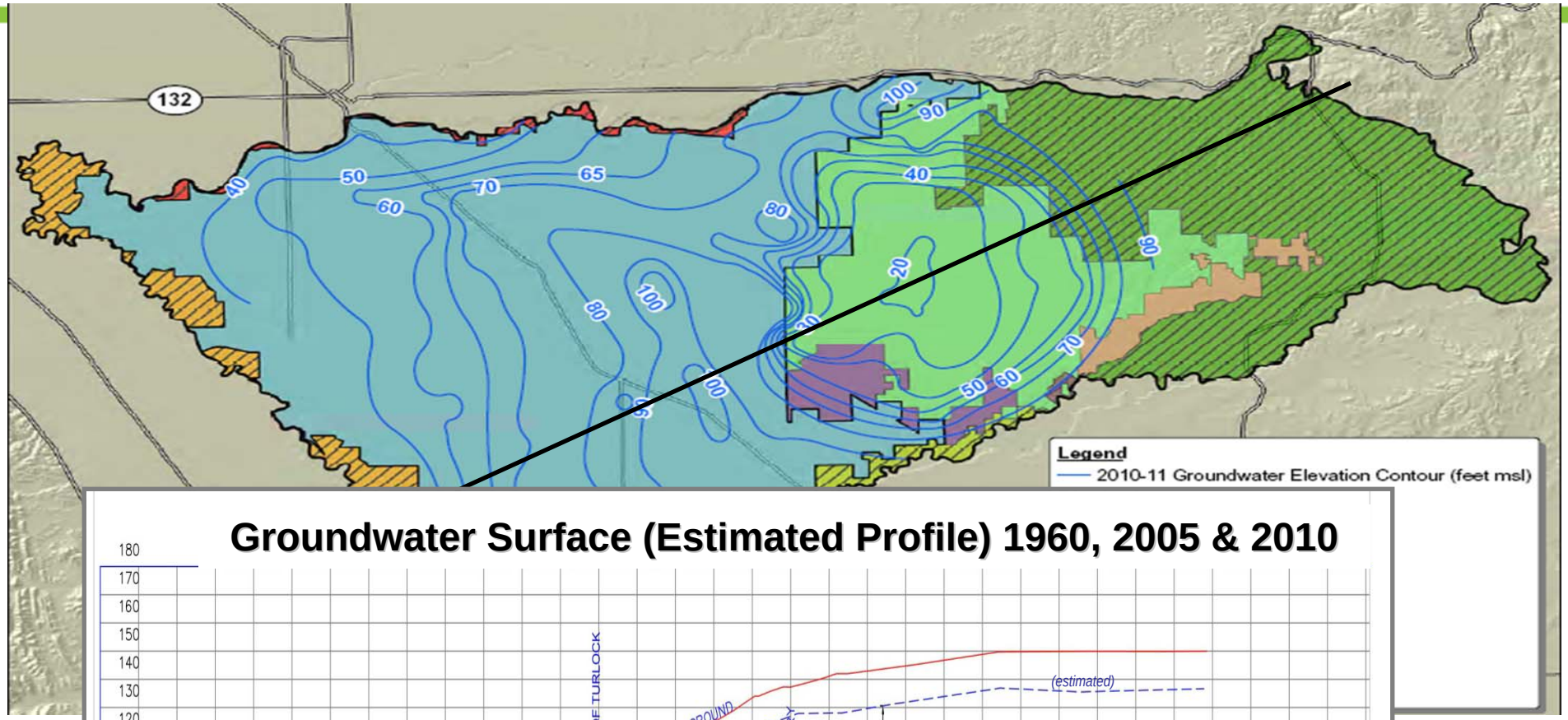
Groundwater Elevations – 1986

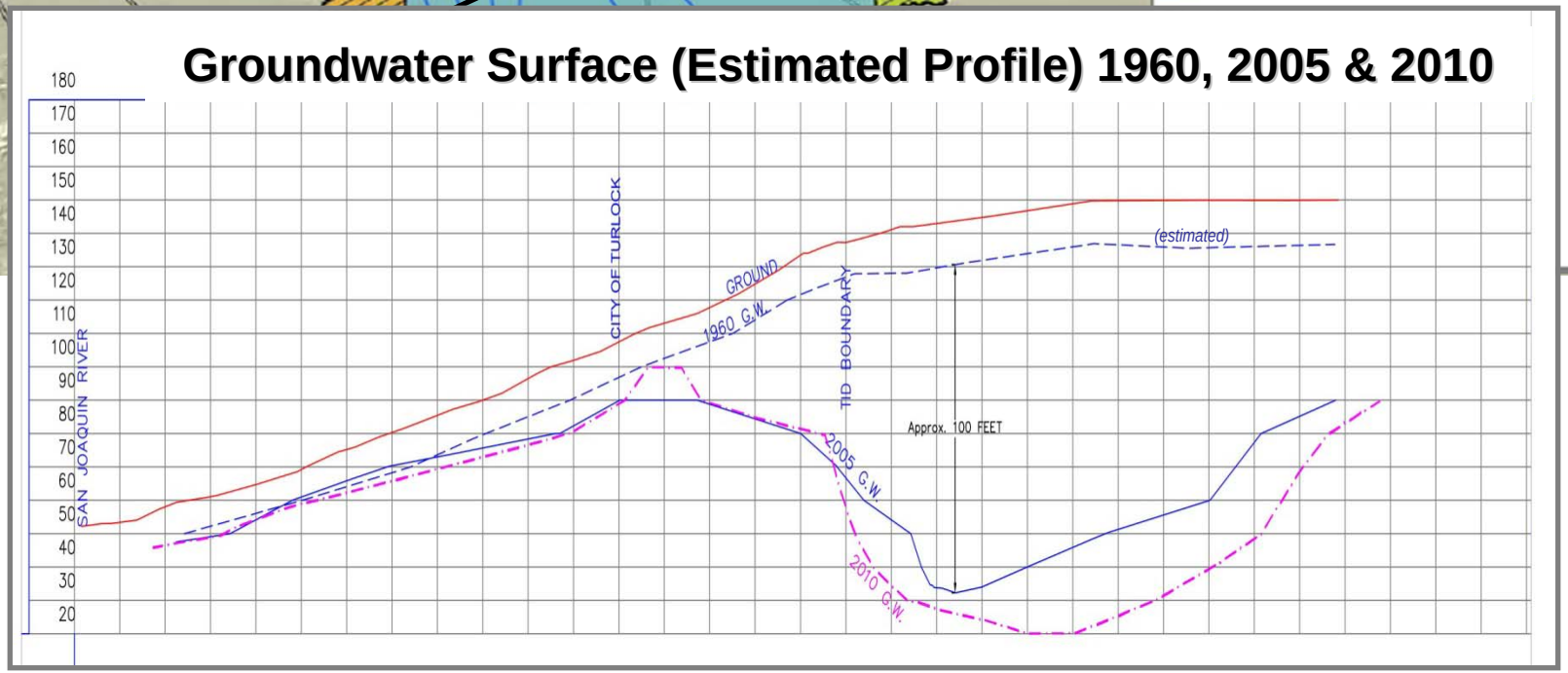


Groundwater Levels - 2010



Cone of Depression





Summary…

- Turlock Basin groundwater management
  - 15 agencies working cooperatively to understand and manage the shared resource:
  - Studying and monitoring the basin
  - Implementing conjunctive use program and other activities
  - Adopted and update Groundwater Management Plan
  - Obtained funding to better understand conditions on east side Basin, and how it could affect future water supplies
- Much has been learned but there is more to be done
- Encourage the County to actively participate in the process
- Adopt GWMP
- Participate in other planning efforts - IRWM
- Work with other agencies to address challenges

Questions?