SWRR

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Sustainability and Water

Two key elements:

1. information and interpretation (indicators)
2. governance, policy, and management

Information and Interpretation (knowledge and understanding)

Information/knowledge

- Open, transparent, accessible (sources, assumptions, methods, calculations)
- Accurate, reveal “error bars”
- Timely and trends
- Understandable, useful, and usable

Information and Interpretation

Interpretation/understanding

- Systems approach (e.g. systems dynamics, key links and relationships, feedback, etc.)
- Trends (change – or not – over time)
- Methodology of interpretation
  - Open and accessible
  - Whole-system analysis (e.g. life-cycle cost/ben, multiple benefits)
  - Calibration and validation
  - Error bars

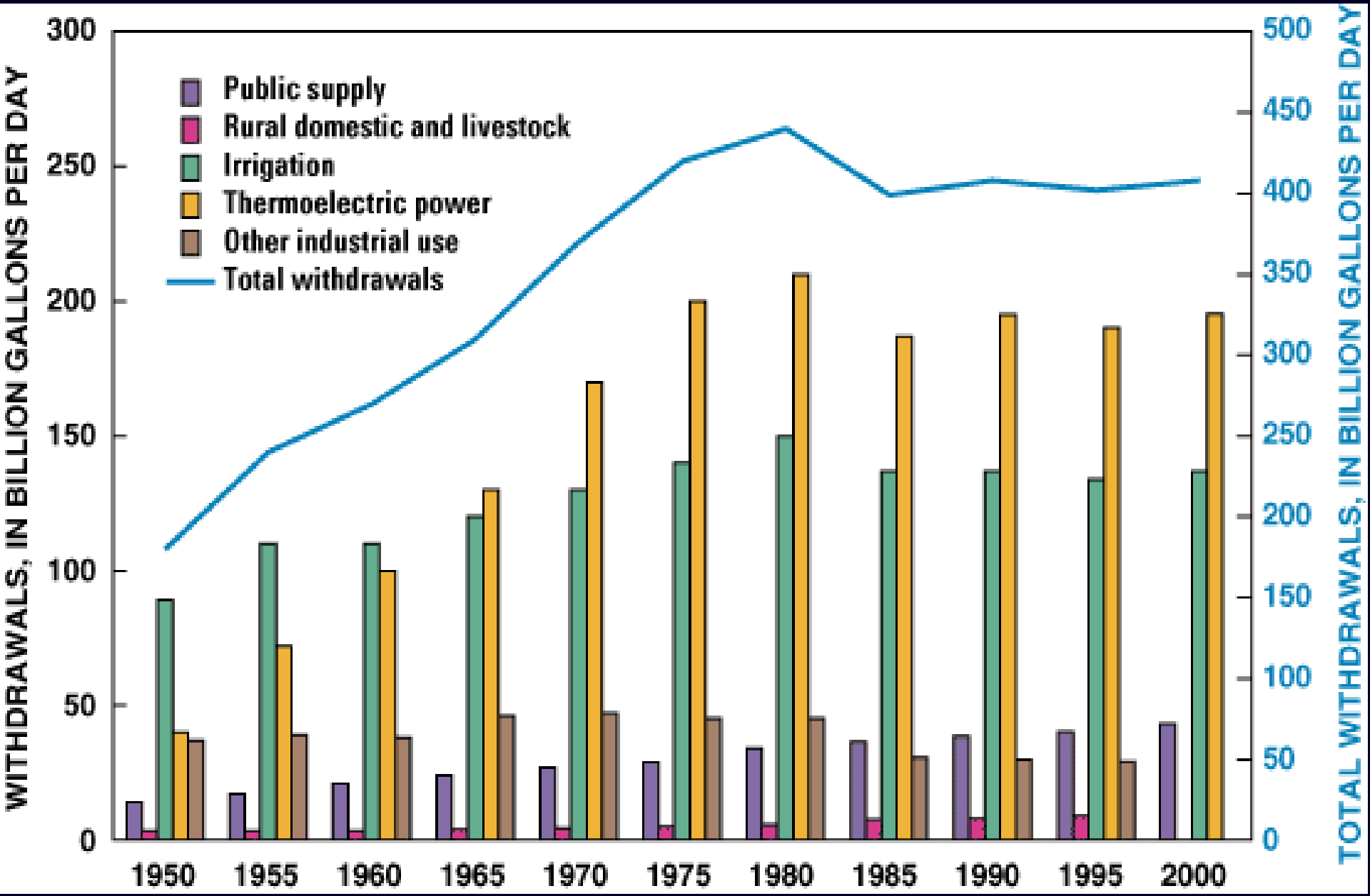
Governance, Policy, and Management

- Decision-making using a full menu of options
- Multiple-benefit assessment and approaches
  - E.g. water/energy/GHG emission reductions
- Improved allocation of resources
  - Water
  - Money
  - Time/effort/staff/research

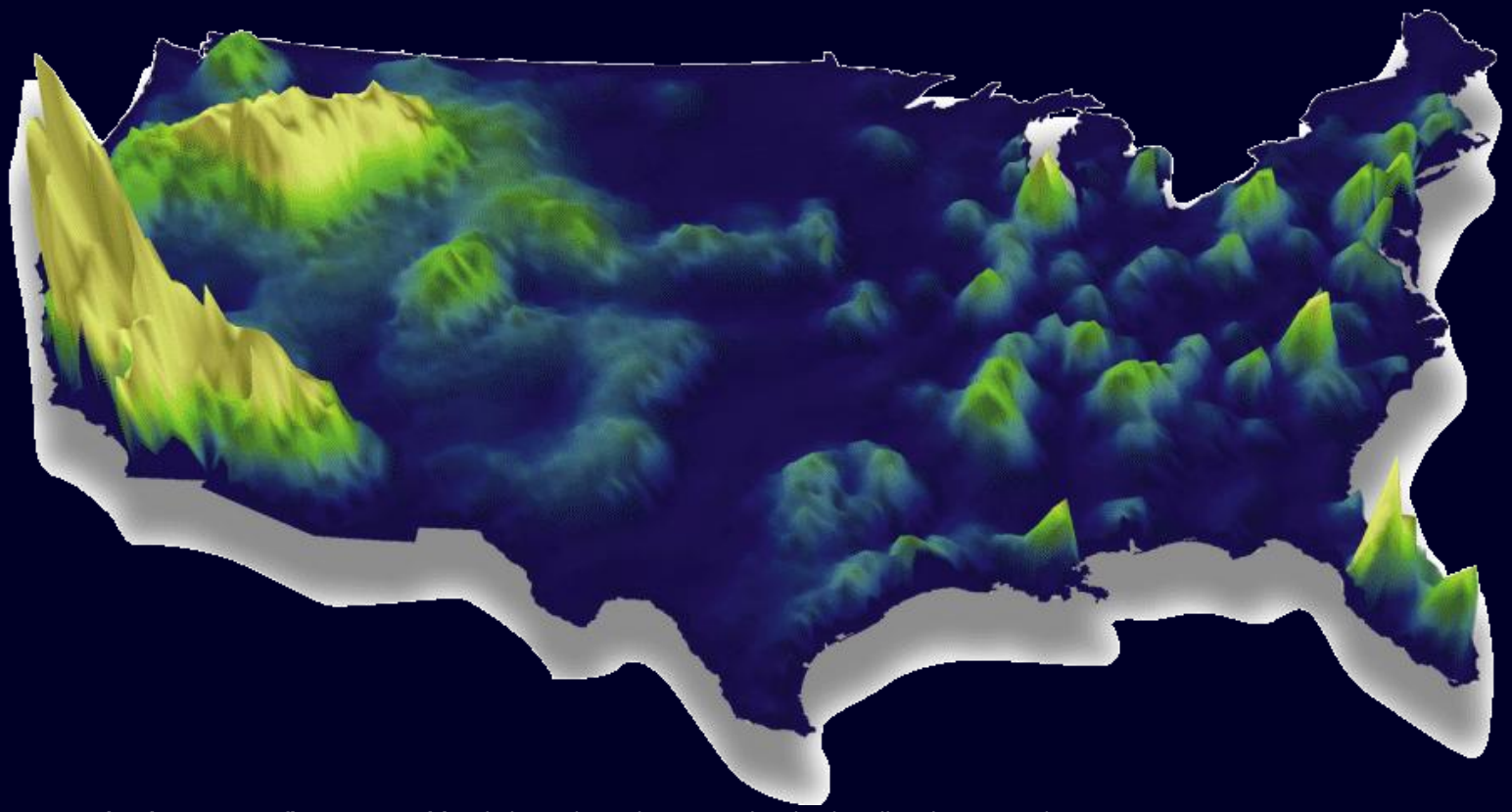
Governance, Policy, and Management

- Improved prospects for collaboration
  - Water/wastewater/stormwater/energy/climate/ pollution prevention …
  - Business/government/environment
- Improved capacity to use information
- Adaptive management

#6 (of 8): Water Withdrawals by End Use

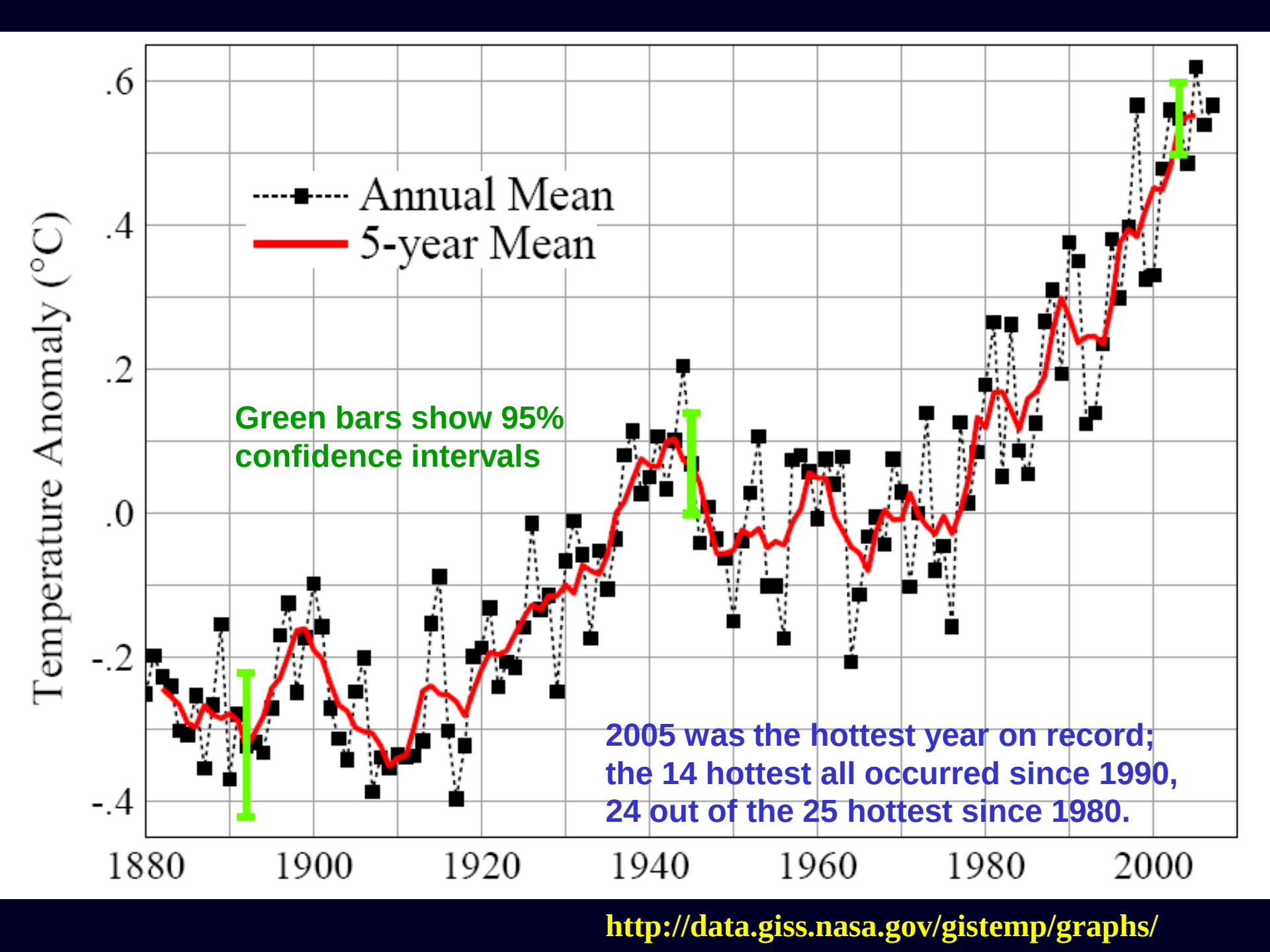


Total Water Withdrawals



Source: **USGS Circular 1268, 15 figures, 14 tables** (released March 2004 and revised April and May 2004)

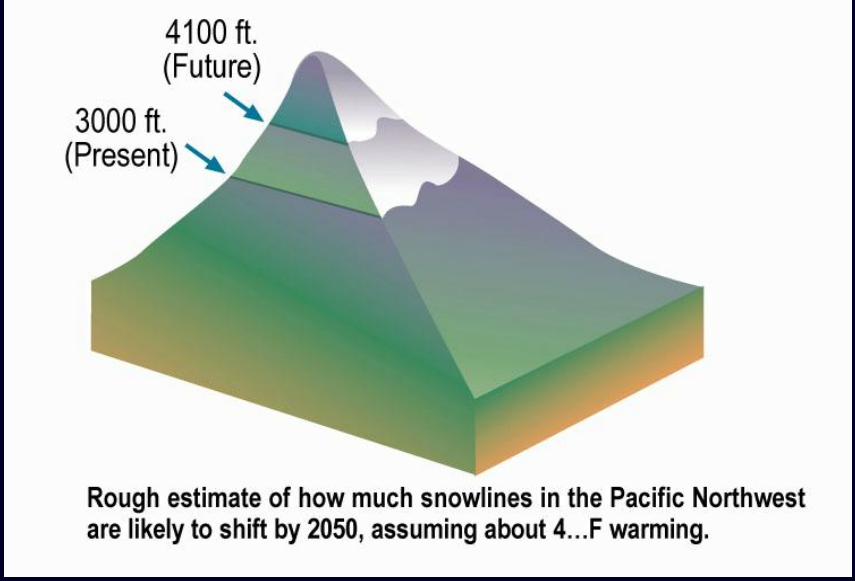
Available at: http://water.usgs.gov/pubs/circ/2004/circ1268/index.html


Annual Mean
5-year Mean
Temperature Anomaly (°C)
.6
.4
.2
.0
-.2
-.4
1880
1900
1920
1940
1960
1980
2000
Green bars show 95% confidence intervals
2005 was the hottest year on record;
the 14 hottest all occurred since 1990,
24 out of the 25 hottest since 1980.
http://data.giss.nasa.gov/gistemp/graphs/

Glacier Retreat

Blomstrandbreen Glacier, Svalbard

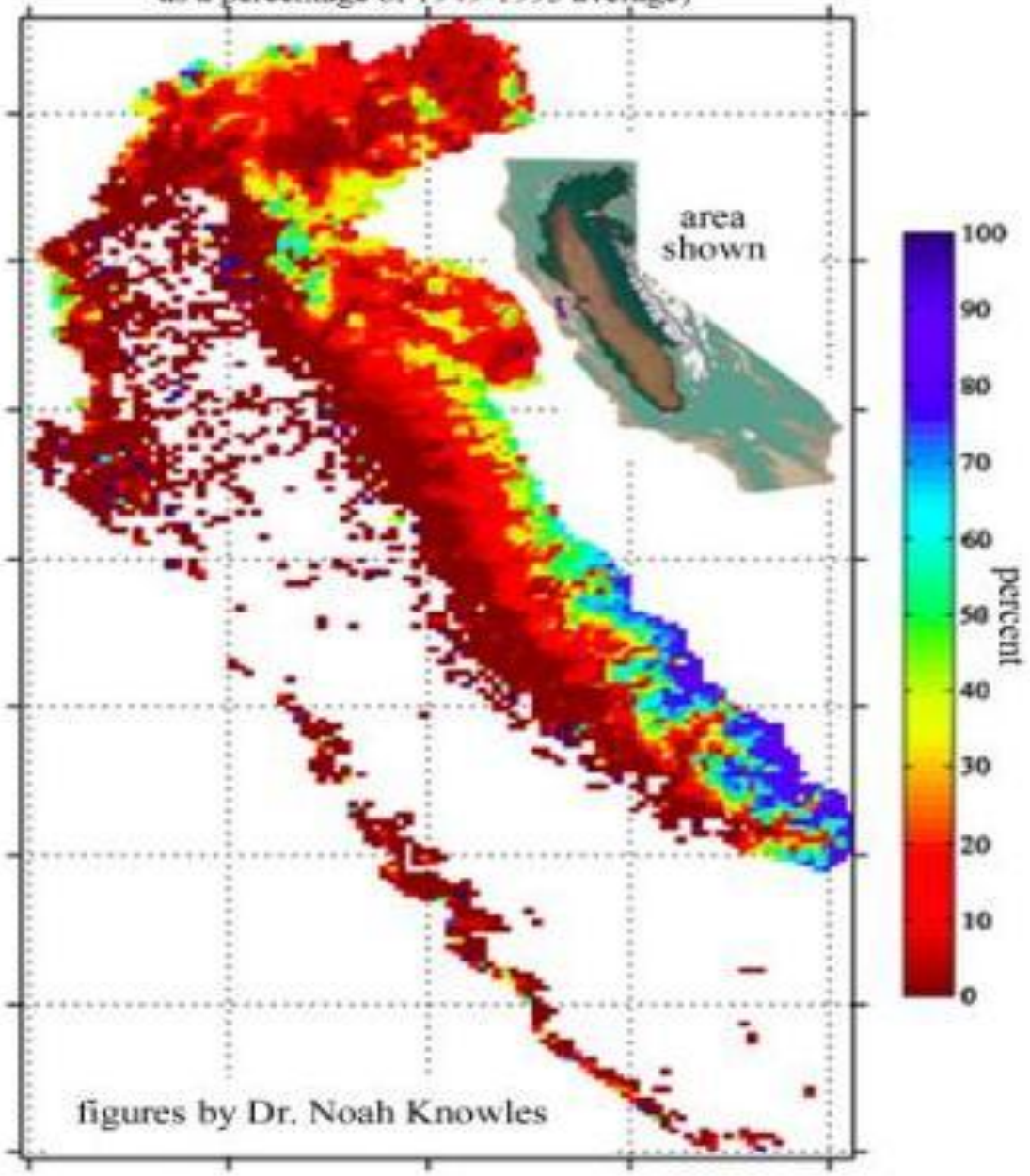
Shift in Snow Elevation



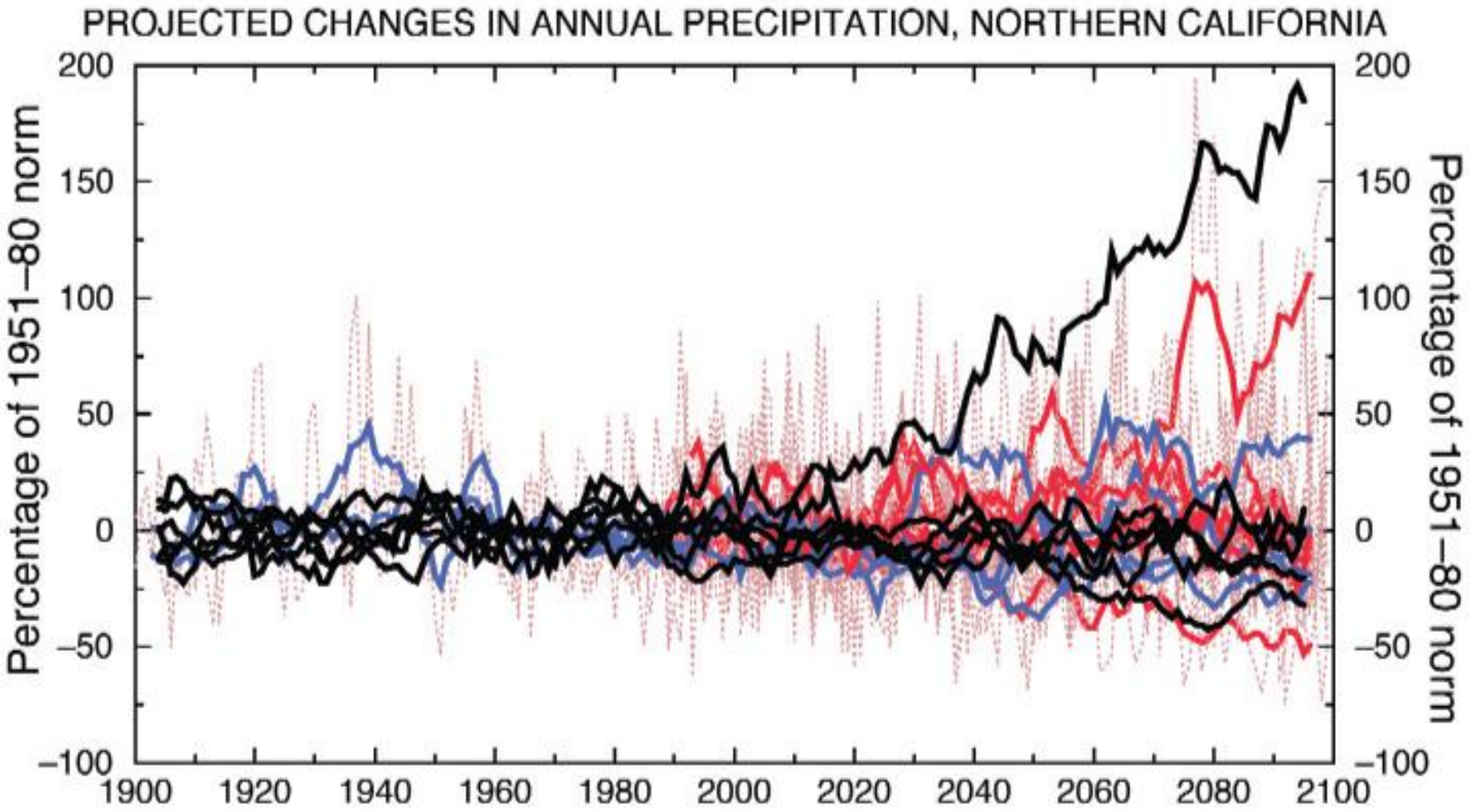
Rough estimate of how much snowlines in the Pacific Northwest are likely to shift by 2050, assuming about 4…F warming.

Snowpack Changes

(average 2050-2069 liquid water equivalent
as a percentage of 1949-1995 average)

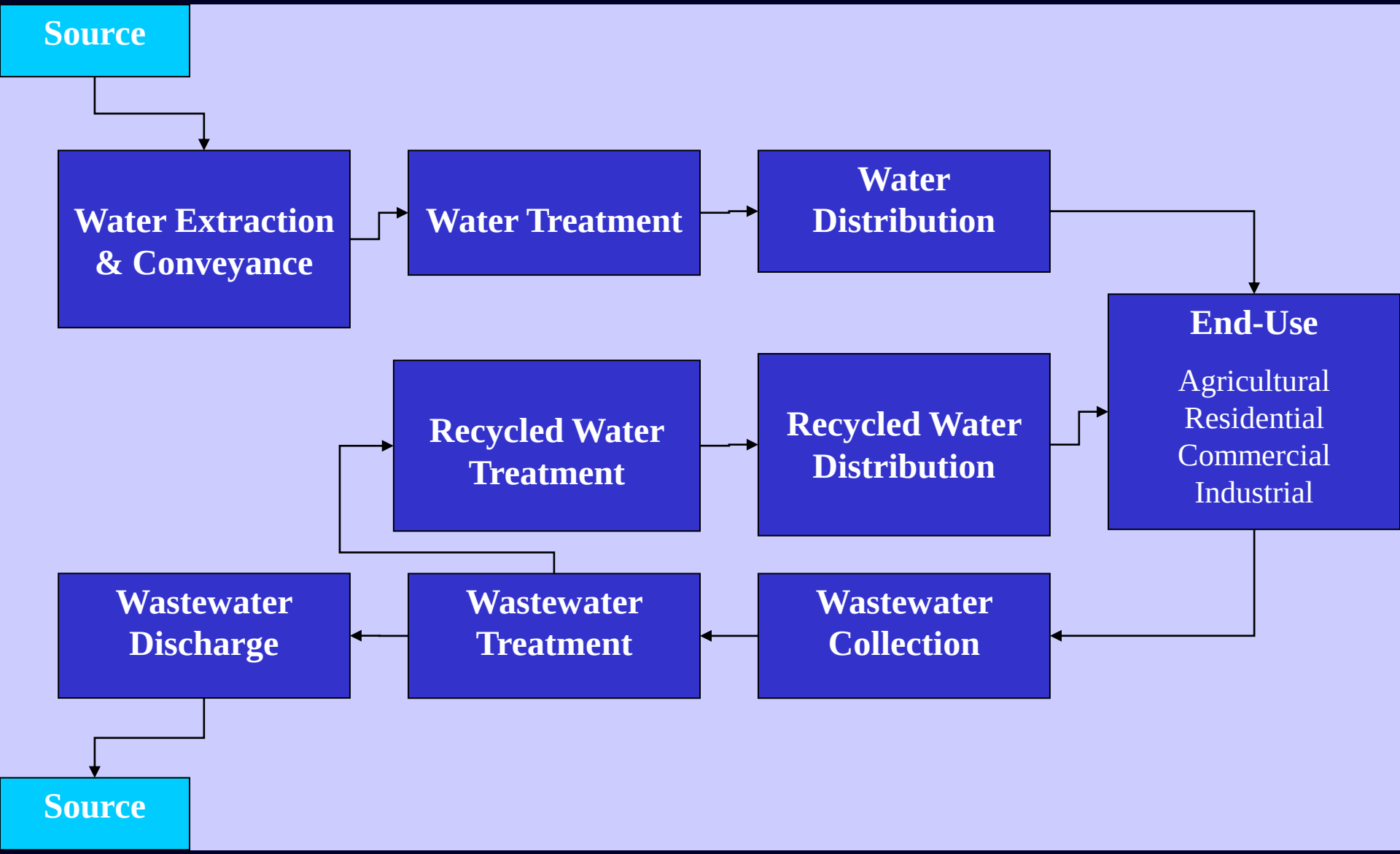


Changes in Precipitation



Dettinger, 2005

Energy Inputs to Water Systems



Energy Intensity of Water

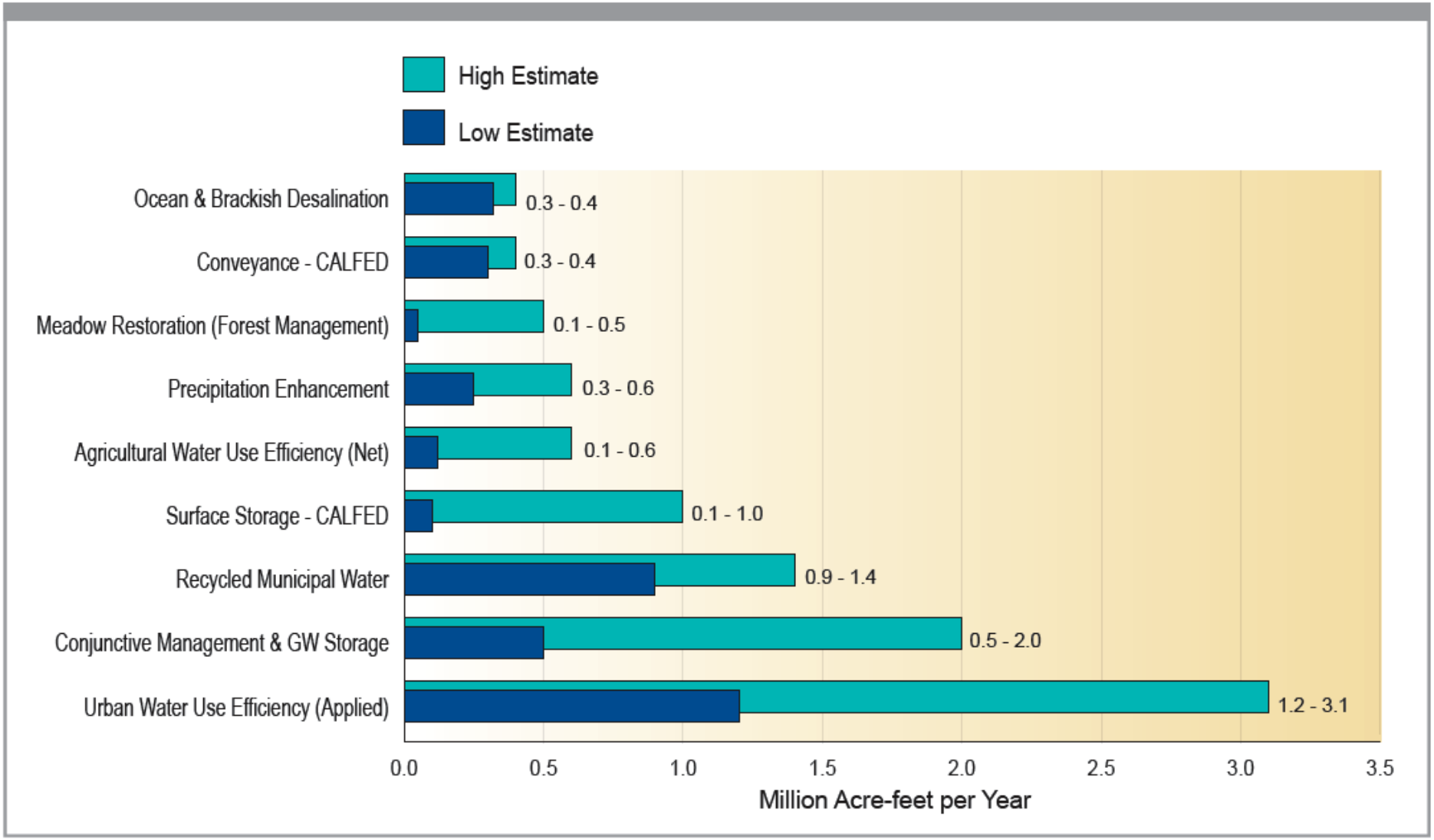
California:

19% electricity

33% natural gas (non-power plant)

Water Supply Sources to 2030: DWR B-160 09

Resource Management Strategies



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