

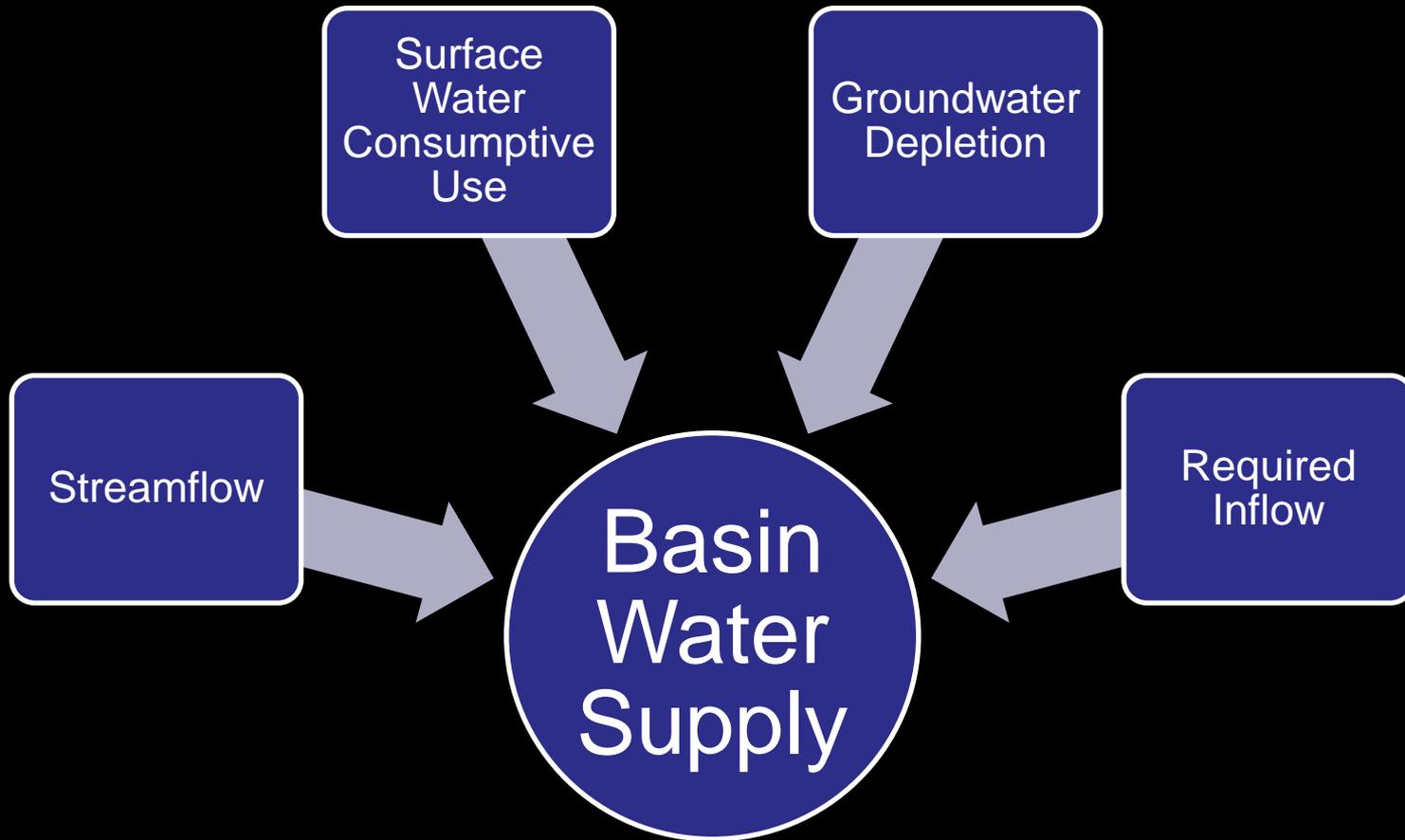
Lower Platte River Basin INSIGHT Data and Analysis

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Components of Basin Water Supply (BWS)



BWS: Streamflow

- Daily data from USGS gages in cfs
- High flow events eliminated by capped at 5% exceedence level
- To avoid double counting, reach-gains used for subbasins with upstream subbasins
- Downstream Demands from upstream subbasins count as required inflows (discussed below)

BWS:

Surface Water Consumptive Use

Type 1: Canal Diversion, Direct Return, Field Delivery available in monthly reports from Reclamation

$$\text{SWCU} = \text{Net Diversion} - (\text{Field Delivery} * 65\%) = \text{CU}$$

Type 3: Canal Diversion records

$$\text{SWCU} = \text{Diversion} * 65\% = \text{CU}$$

Type 4: Small pumpers/direct diverters

No direct diversion or use records

$$\text{SWCU} = \text{NIR} * \text{Acres} * \text{NASS Adjustment} = \text{CU}$$

BWS:

Surface Water Consumptive Use

- Reservoir Evaporation
 - Calamus
 - Sherman
 - Davis Creek

$$\text{SWCUE} = [(\text{Pan evaporation} * 0.7 * \text{surface area}) - (\text{precipitation} * \text{surface area})]$$

BWS:

Groundwater Depletion

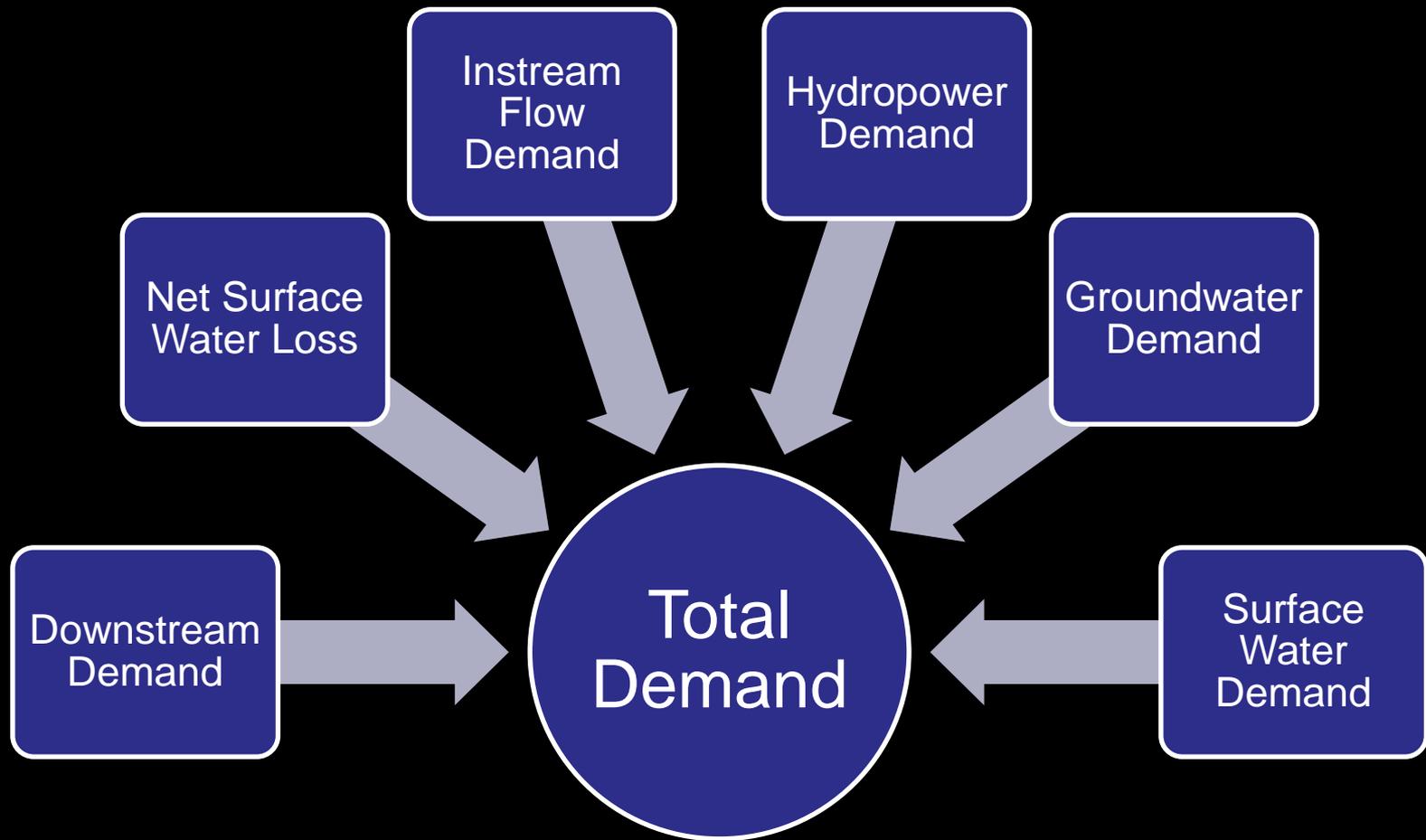
- Based on groundwater model results from CENEB (Loup and Elkhorn Basin upstream of Norfolk)
- Analytical model for the rest of the area
- New numerical model will replace the analytical results in the future

BWS:

Required Inflow

- Based on downstream demands assigned to upstream basins
- Those demands are generally proportioned based on the percentage of BWS from each sub-basin

Total Demand (TD)



TD:

Surface Water Demand

- Same as surface water consumptive use except when under water administration
- Water administration adjustments applied only to appropriations junior to instream flows (1993)

TD:

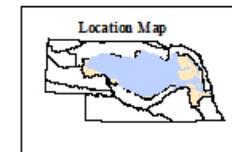
Groundwater Demand

- For Near-Term, modeled groundwater depletions were used (same as used for BWS)
- For Long-Term, estimated groundwater consumption within the 10/50 area was used
 - Irrigation
 - Municipal
 - Industrial

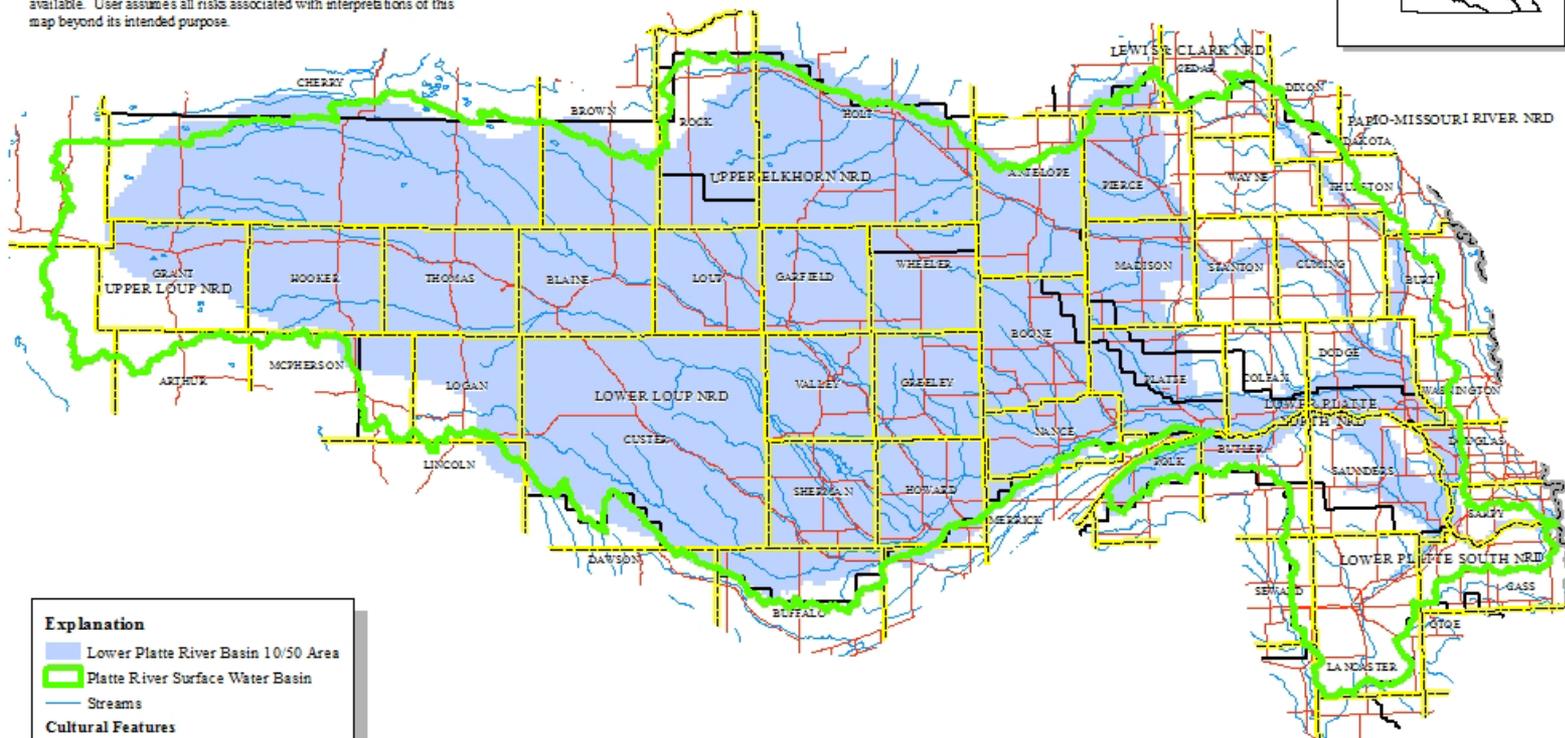


Planning and Assistance Division

Map of Geographic Area within which Surface Water and Ground Water Are Hydrologically Connected For Purposes of the Determination of Fully Appropriated LOWER PLATTE RIVER SURFACE WATER BASIN



This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.



Explanation

- Lower Platte River Basin 10/50 Area
- Platte River Surface Water Basin
- Streams

Cultural Features

- County Boundary
- State Boundary
- NRD Boundary
- Highways



Base map produced by Kevin Schwartman, April 27, 2006
Base map approved June 1, 2006
Surface water diversion map produced by Kevin Schwartman, December 10, 2013

TD:

Hydropower Demand

- Calculated by adding streamflow and groundwater depletions and then capping at permitted amount

$\text{Min}(\text{daily } Q + \text{GW depl.}, \text{daily permitted amount})$

TD:

Instream Flow Demand

- Only considered for permitted instream flow rights
- North Bend and Louisville
- Largely represented by non-consumptive demand for hydropower (LPPD)

TD:

Net Surface Water Loss

- Intended to account for water to convey surface water consumptive use
- Only included for larger irrigation districts and canals (Loup Basin)
- Calculated as the difference between diversion and CU

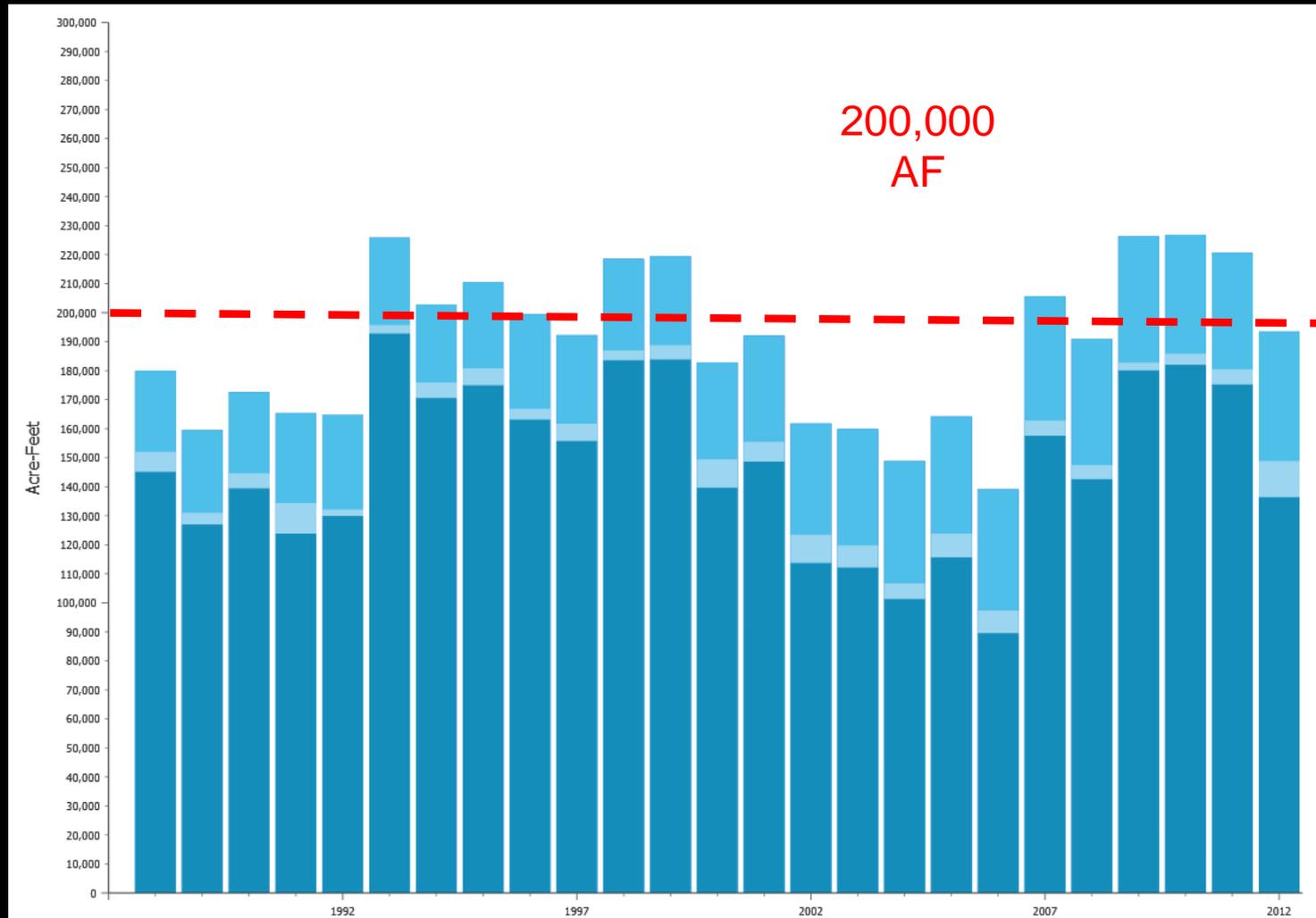
TD:

Downstream Demand

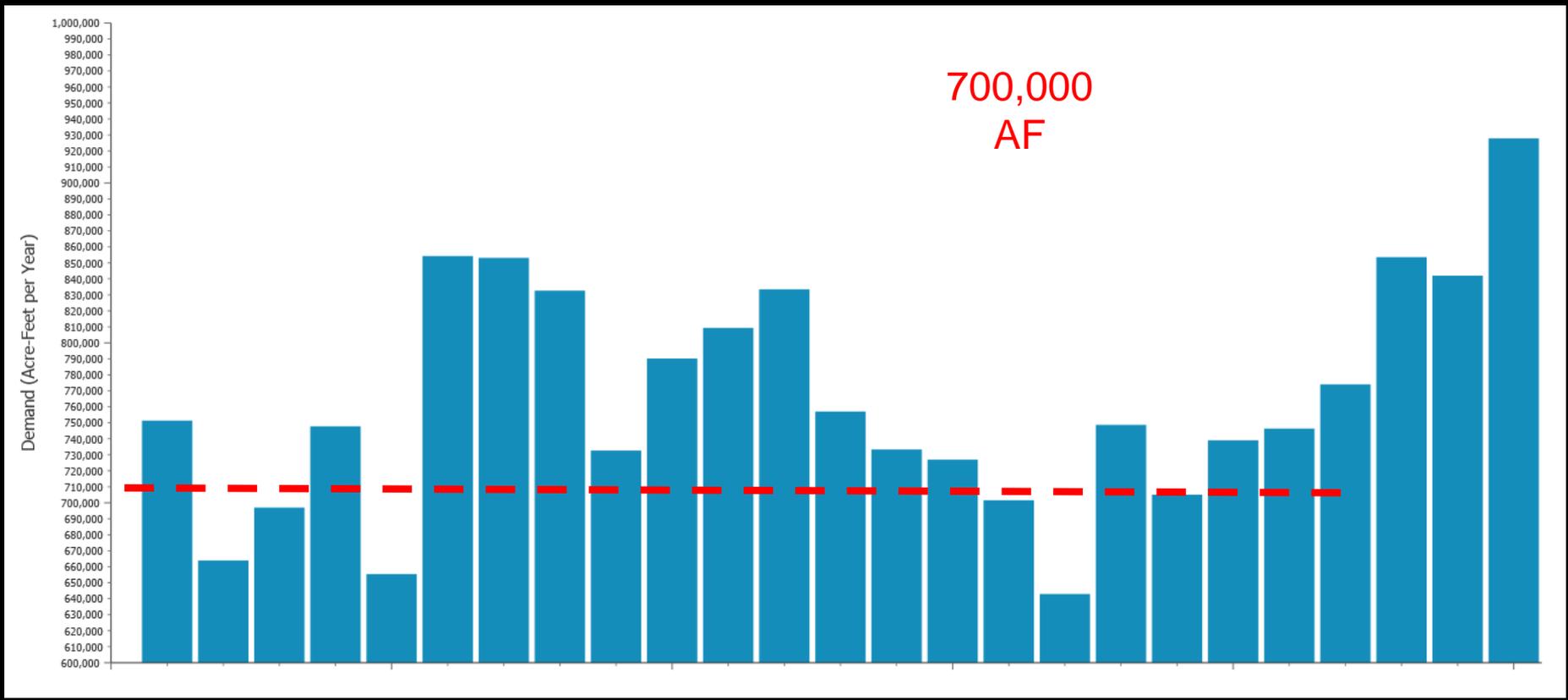
- Based on downstream *mainstem demands*
- Proportioned based on contribution of each sub-basin BWS to the total sub-basin for consumptive uses
- Hydropower proportioned based on percentage of depletion from each sub-basin
- <http://www.dnr.nebraska.gov/Media/IWM/Statewide/INSIGHTMethodsCurrentVersion.pdf>

Going Further into the Data

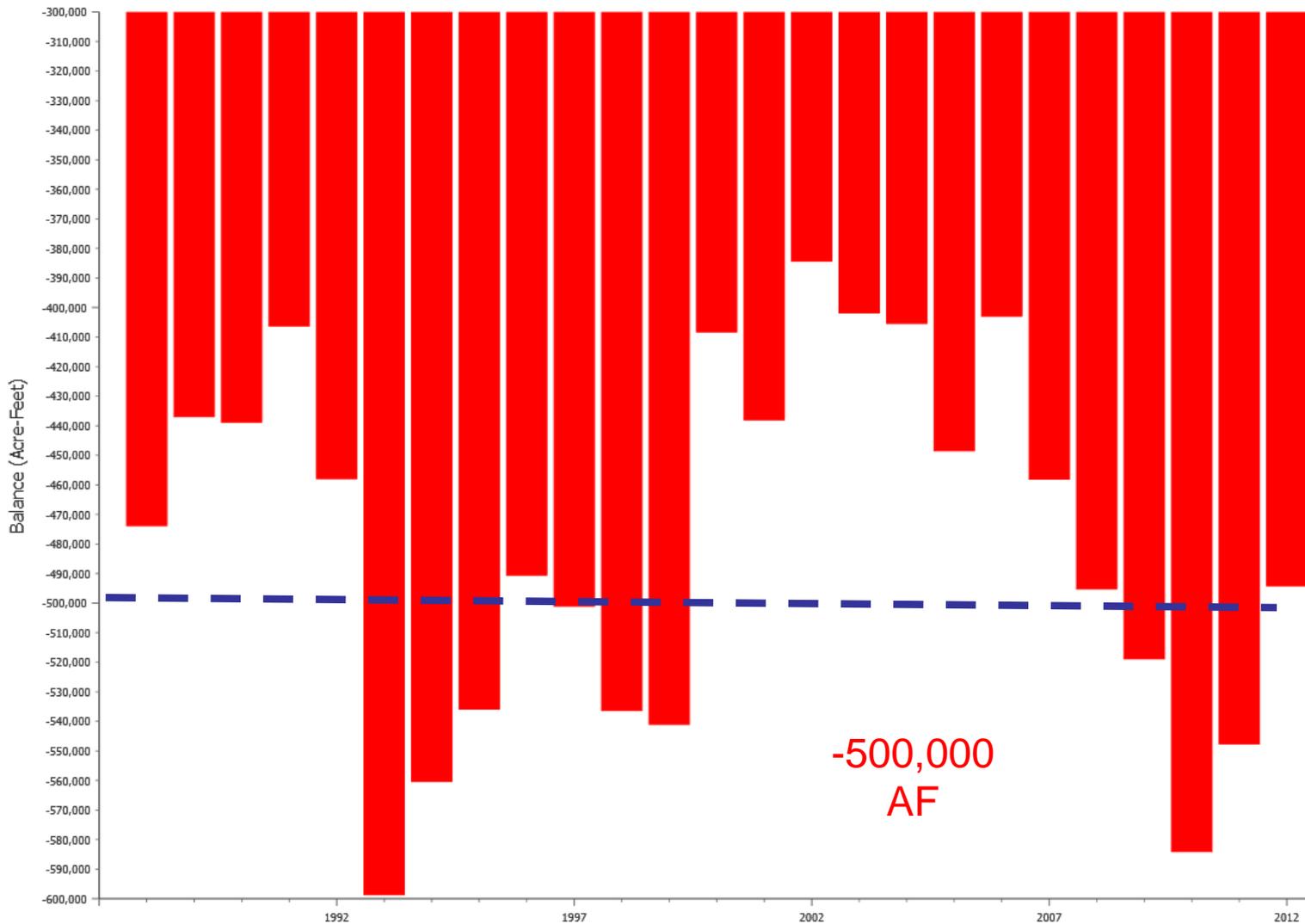
South Loup Basin Example: Water Supply



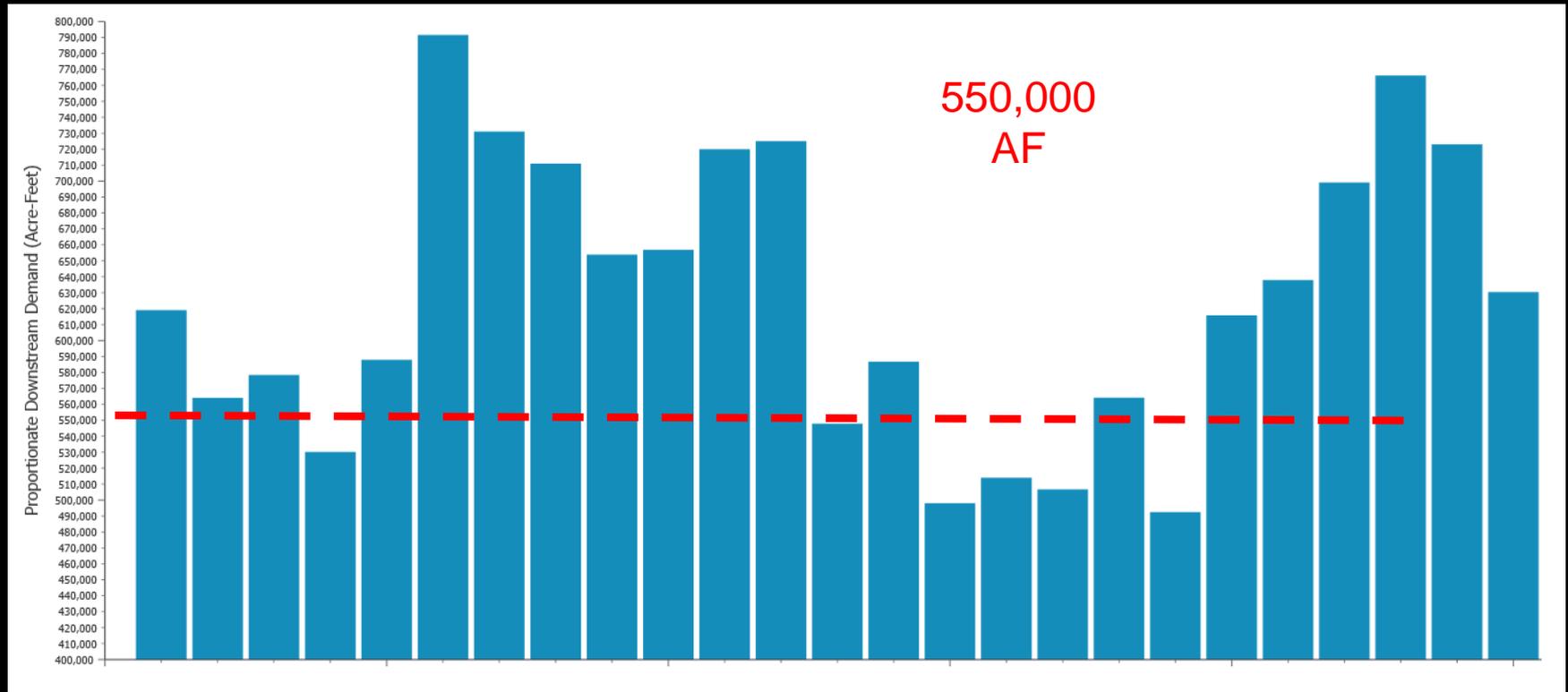
South Loup Basin Example: Total Demand



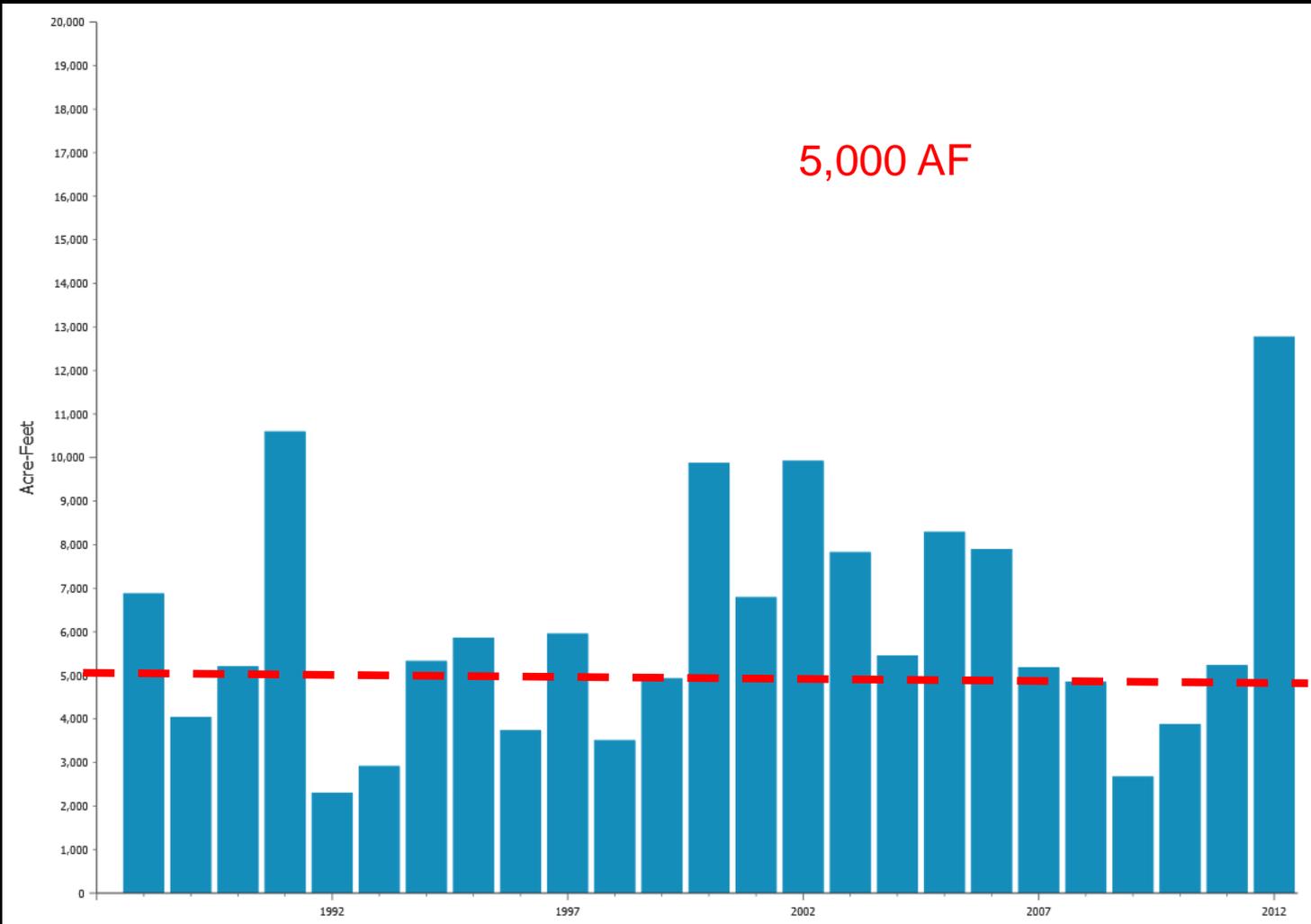
South Loup Basin: Balance



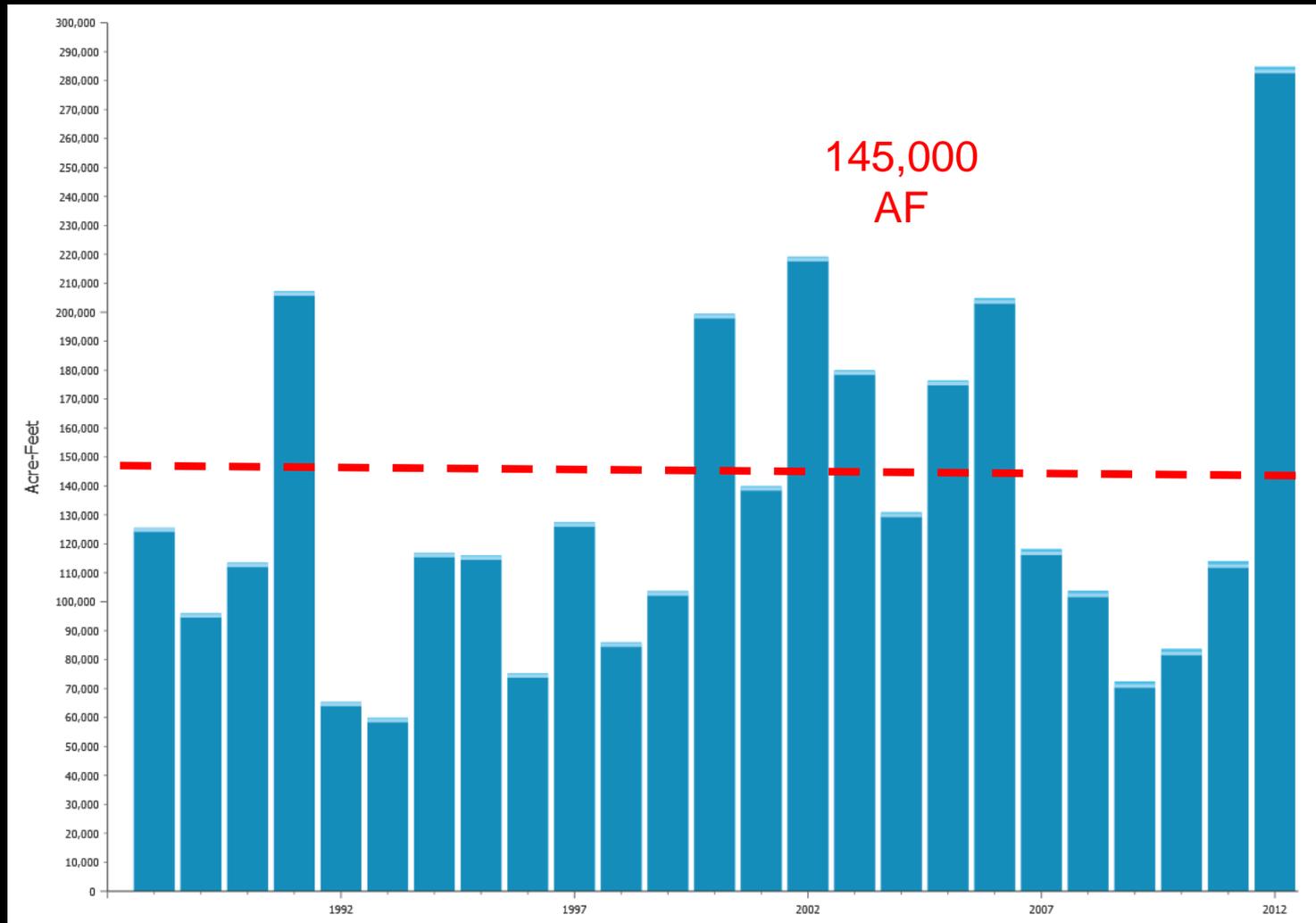
South Loup Basin Example: Downstream Demand



Taking a closer look at Demands: Surface Water



Taking a Closer Look at Demands: Groundwater



Example: South Loup Demands Only

- Supply ~200,000 AF
- TotalDemand ~ 700,000 AF
- Downstream Demand ~ 550,000
- SW Demand ~5,000 AF
- GW Demand ~145,000 AF
- Long-term: South Loup streamflows
50,000 AF



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