

An Overview of Maine's Ground Water Resources

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Maine Geological Survey

Ground Water Study Group, December 13, 2005



Outline

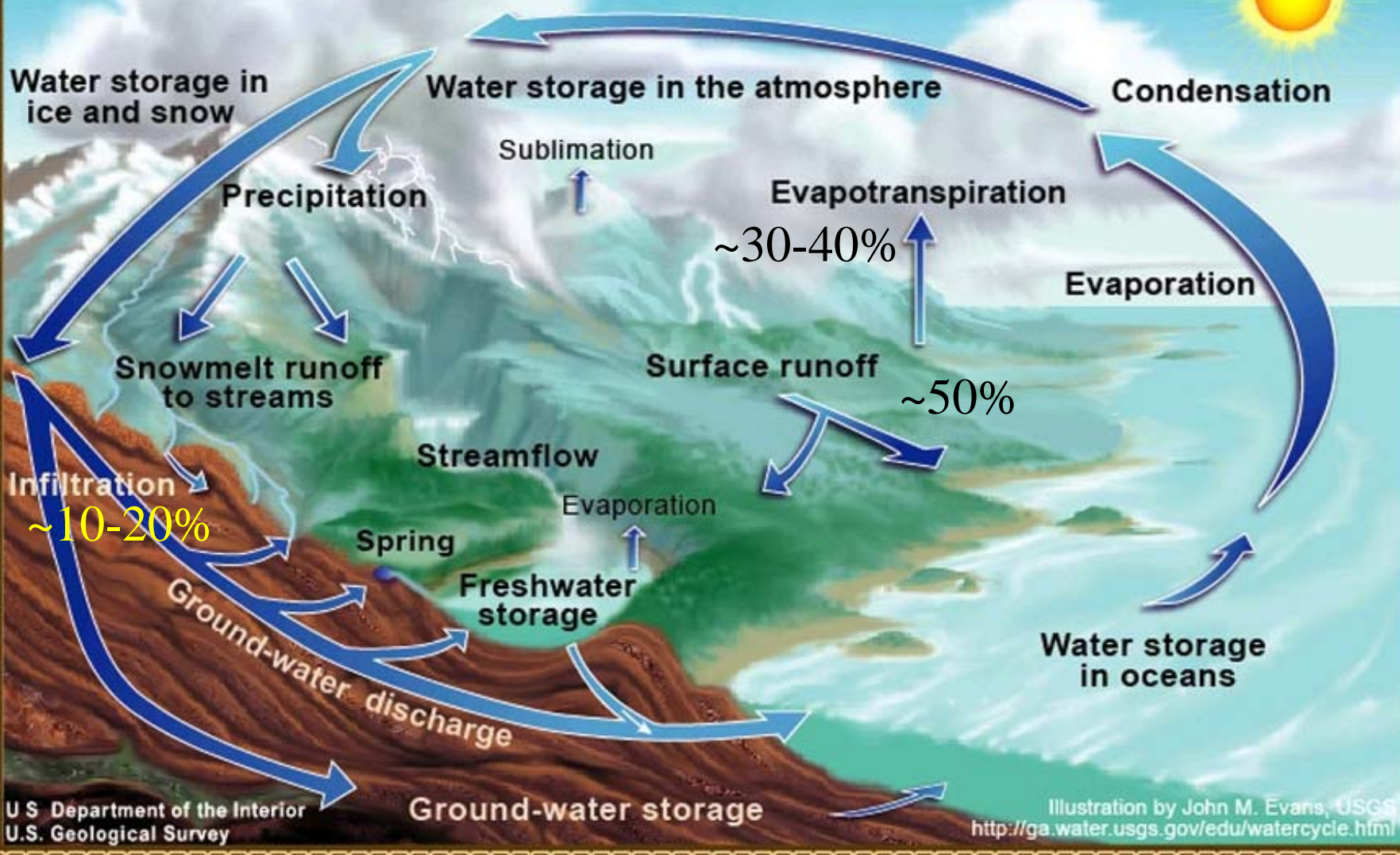
- Maine water resource statistics, hydrologic cycle
- Maine water use statistics
- Maine aquifer types, distribution
- Annual ground water cycle, long-term statistics
- Ground water / surface water interaction basics

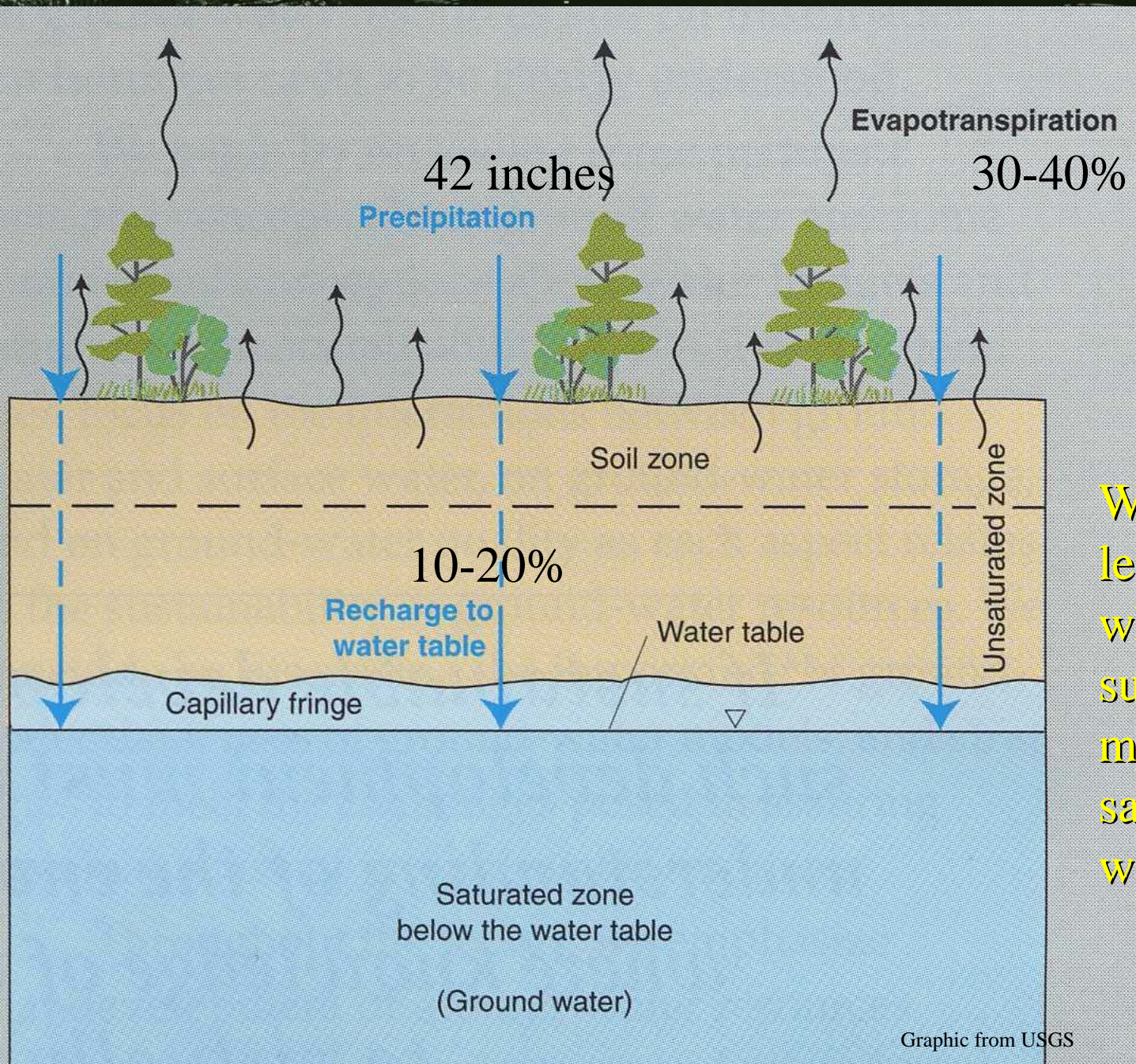
Maine Water Statistics

- Average annual rainfall: 42 inches = 73,500,000 acre-feet, 24 trillion gallons.
- Run-off: ~ 50% of precipitation, 12 trillion gallons
- Evaporation/transpiration: ~ 30-40% evaporates or is transpired through vegetation. 7-10 trillion gallons.
- Infiltration to ground water: ~ 10-20% infiltrates to ground water. ~ 2-5 trillion gallons annually.

Sources: National Weather Service, Maine Ground Water Handbook

The Water Cycle





Maine Water Ground Water Use Statistics

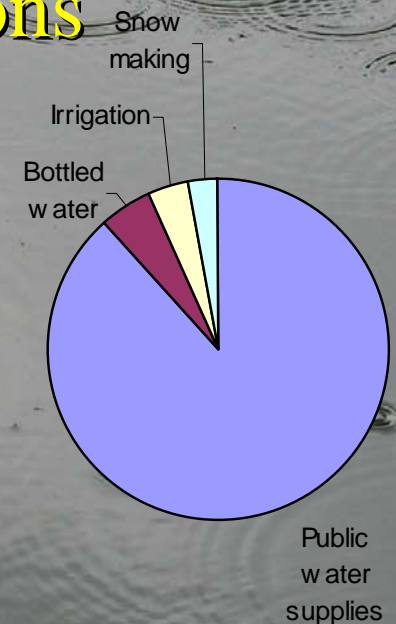
2003-2004

Public water supplies – 8 billion gallons

Bottled water – 450 million gallons

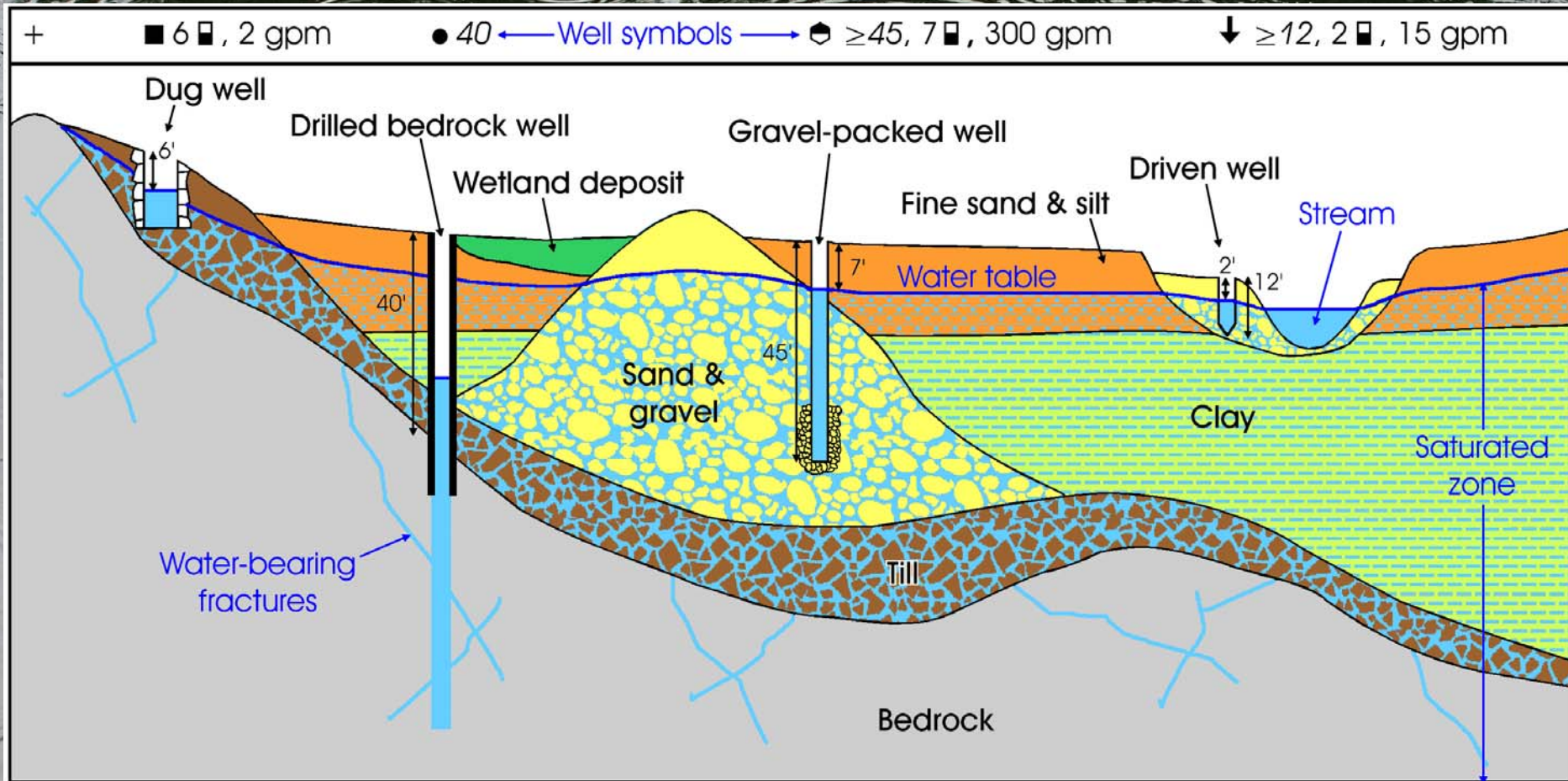
Irrigation – 350 million gallons

Snowmaking – 250 million gallons



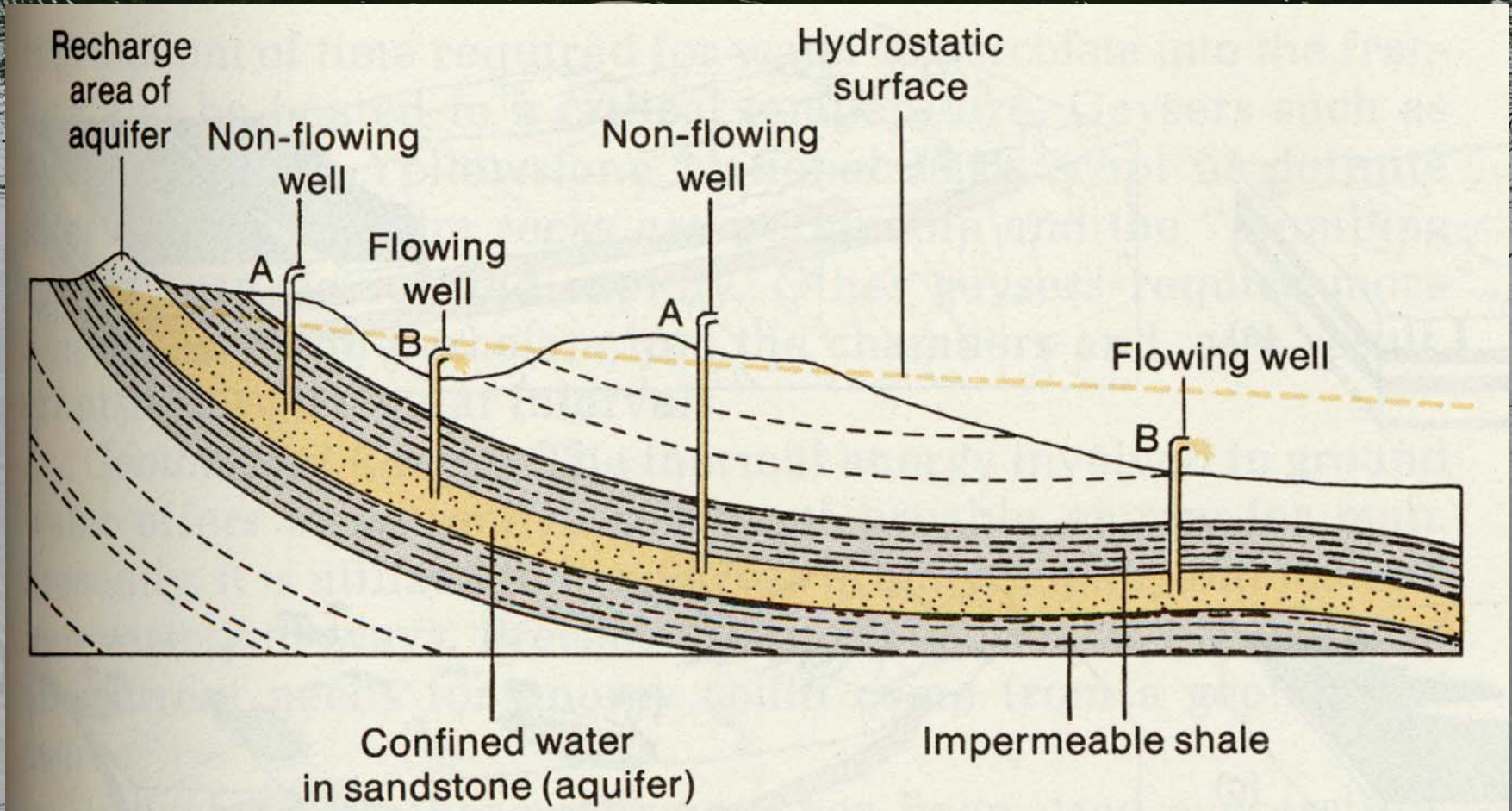
Source: DEP Water Use Reporting Program

Types of aquifers in Maine



Maine Geological Survey graphic

Typical Western United States aquifer

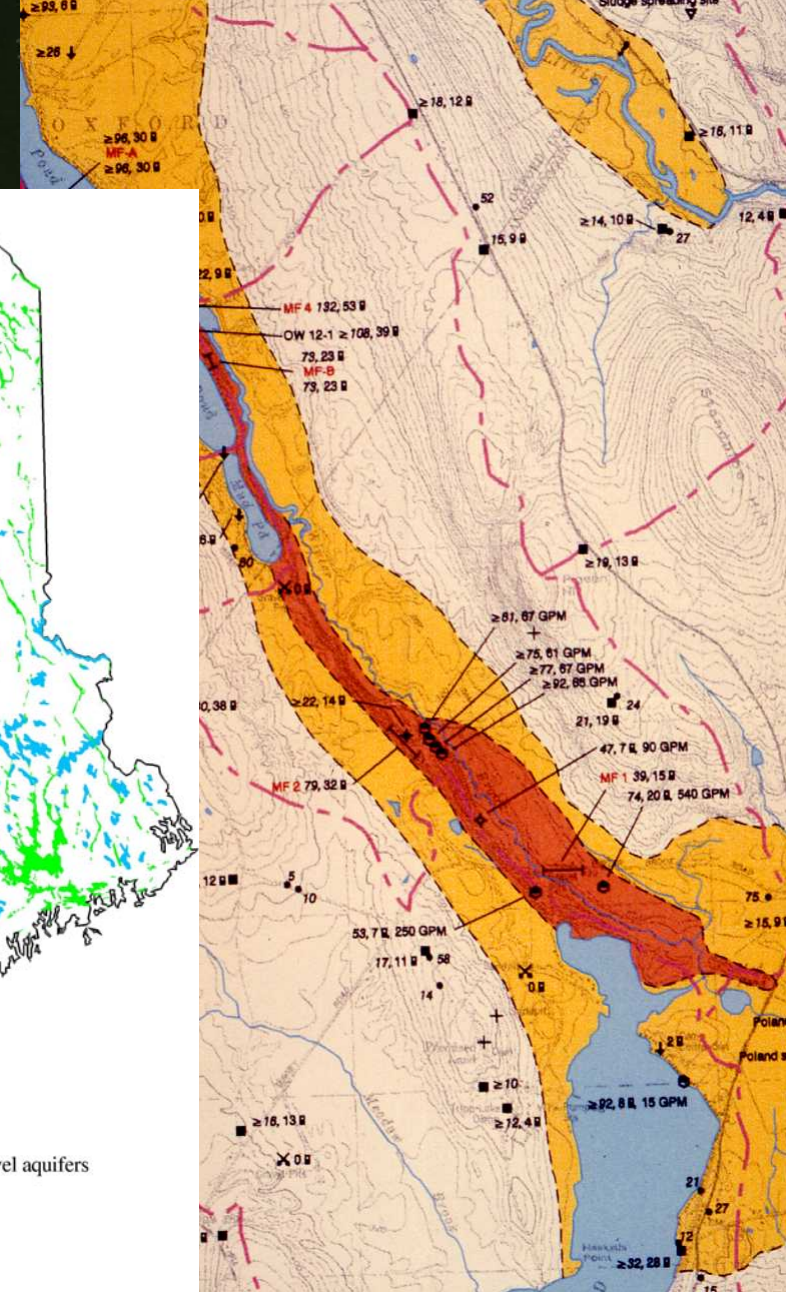
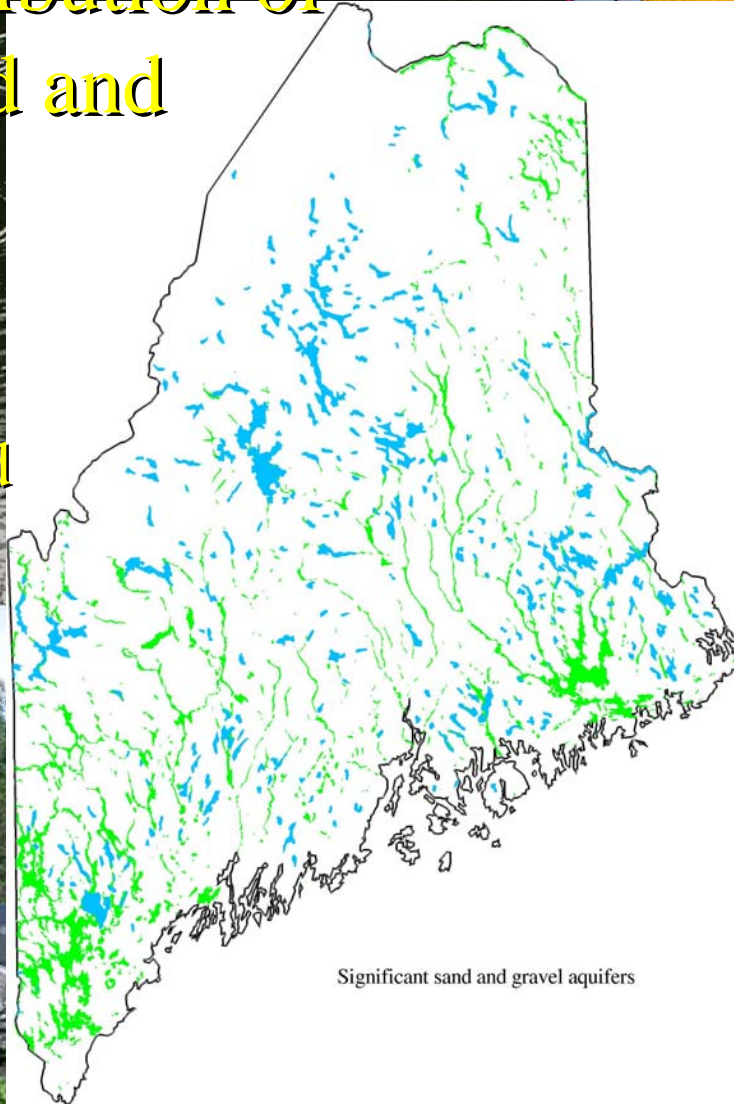


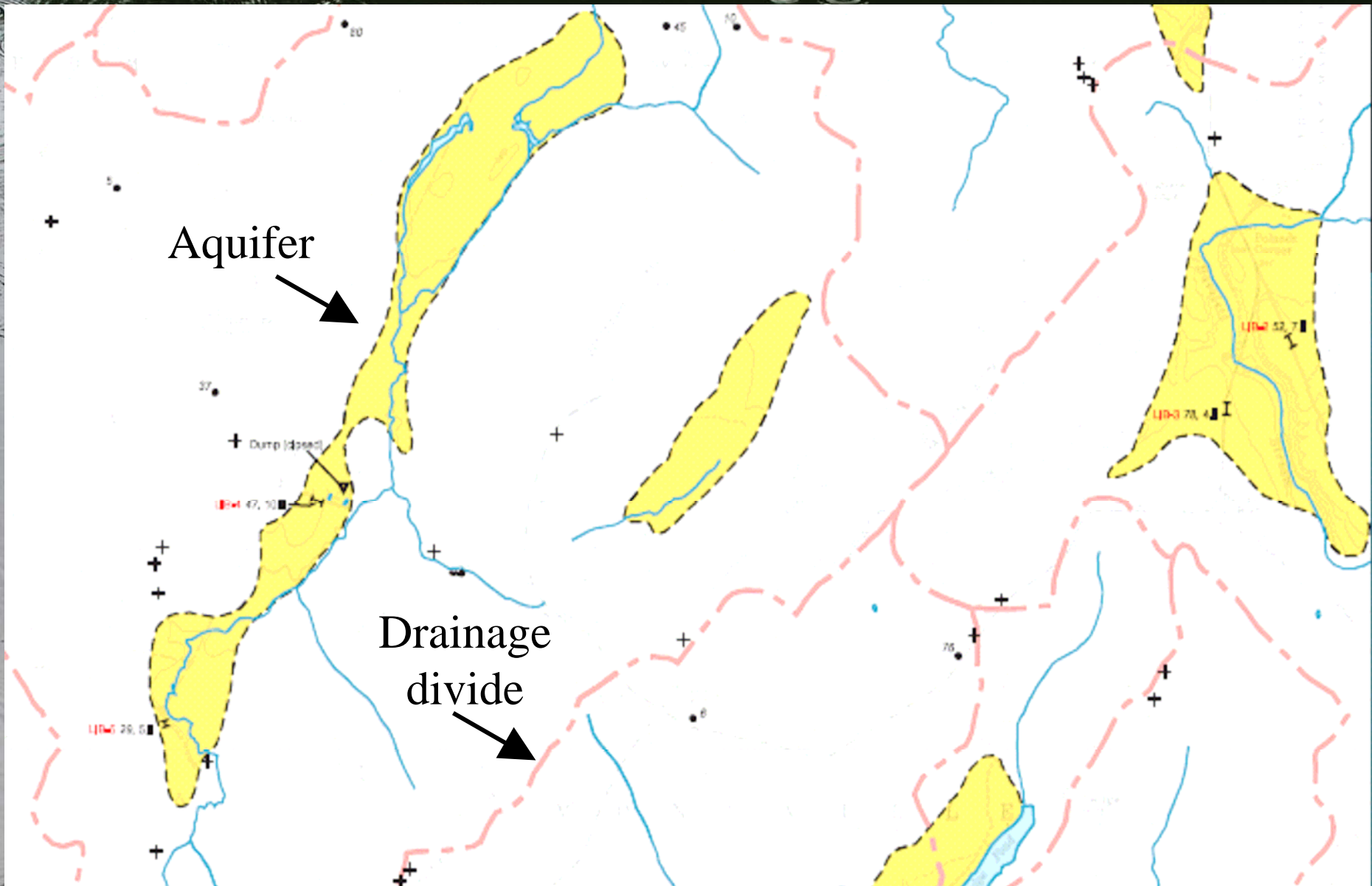
500 – 1,000 miles

Graphic: Hamblin,
1975, Burgess Press

Statewide distribution of significant sand and gravel aquifers

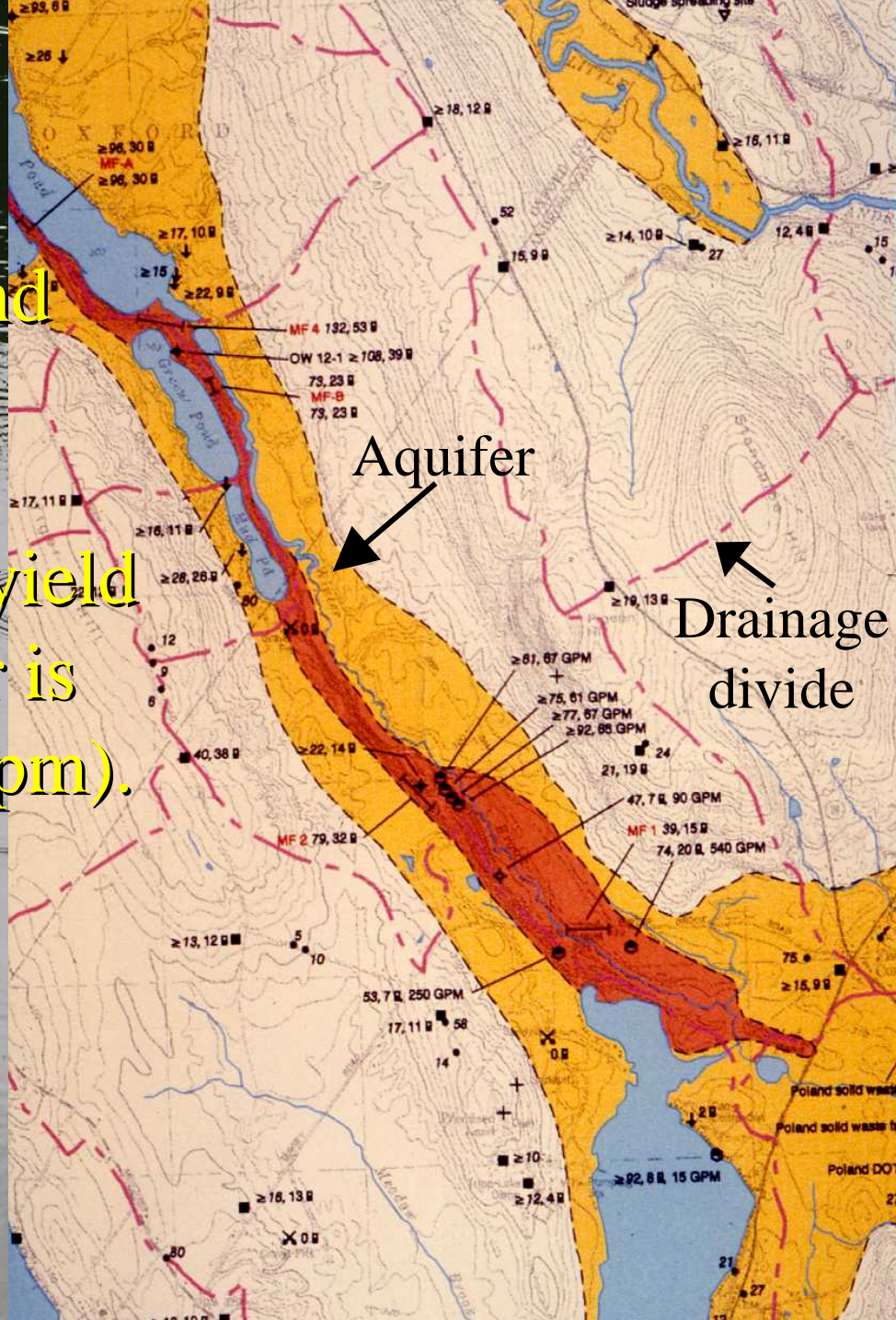
1,300 square miles of mapped sand and gravel aquifers.



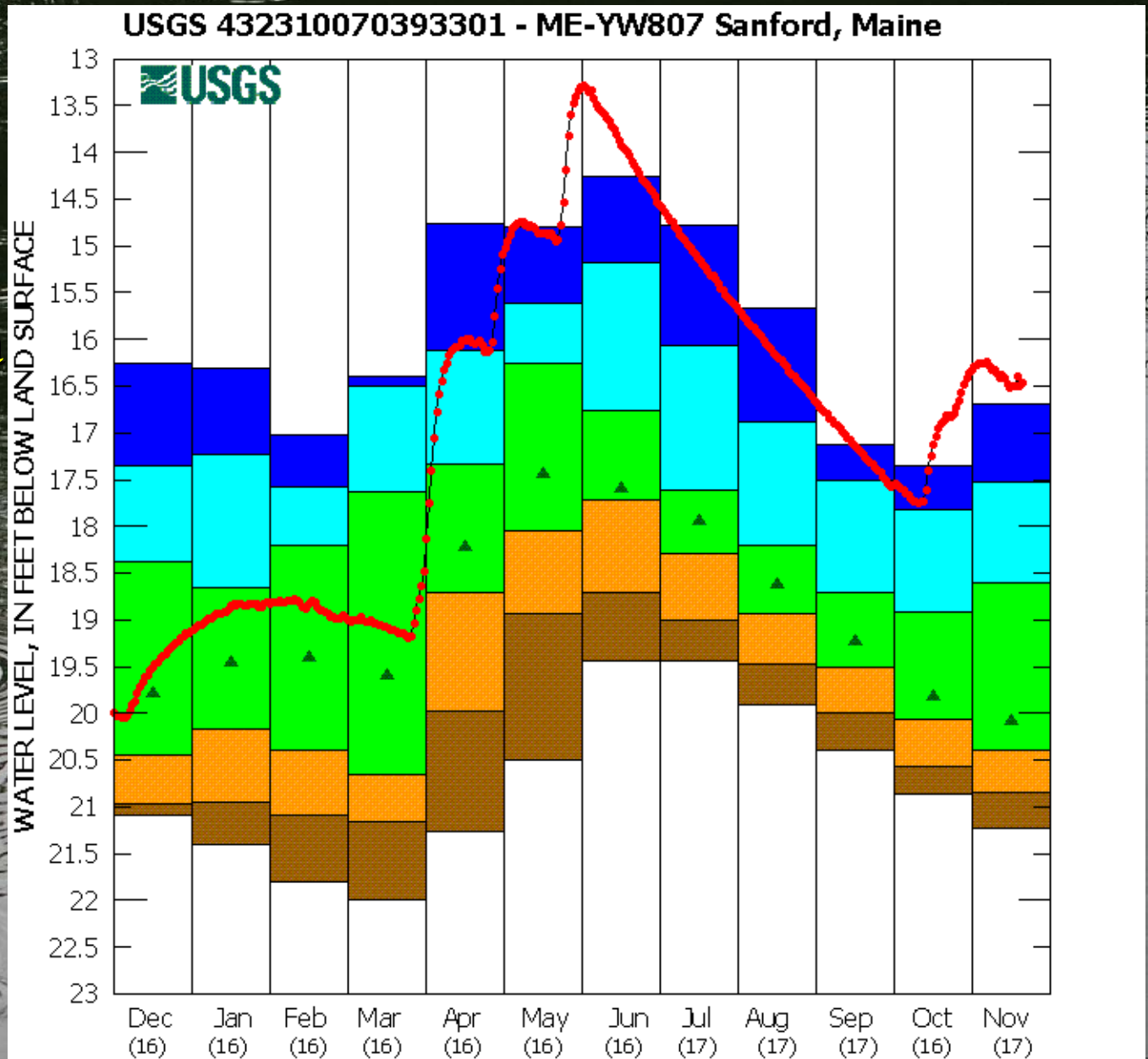


Examples of sand and gravel aquifer units entirely within single watersheds.

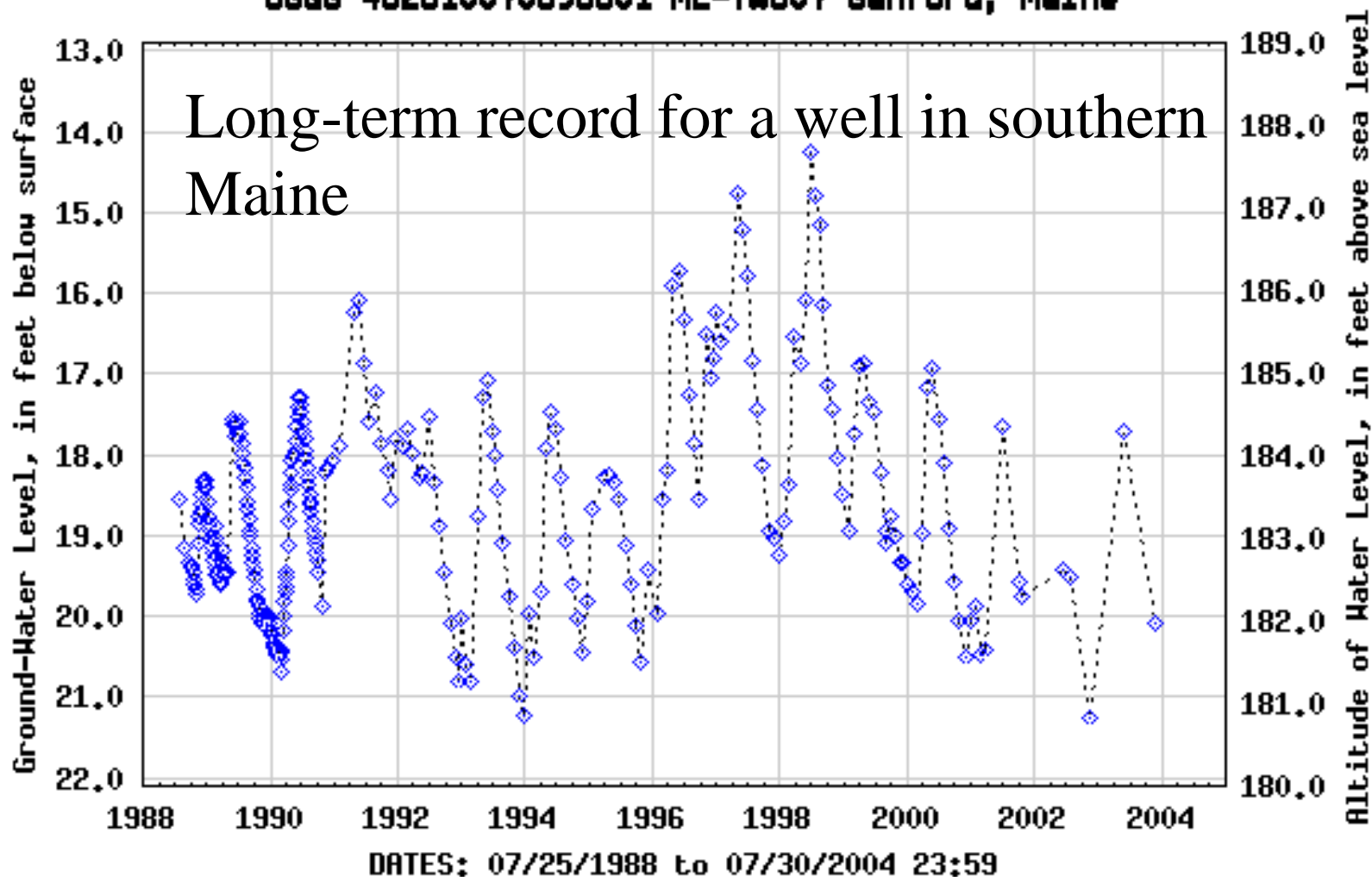
Example of a sand and gravel aquifer that crosses watershed boundaries. A high-yield portion of the aquifer is shown in red (> 50 gpm).



Annual water level variation for a well in southern Maine

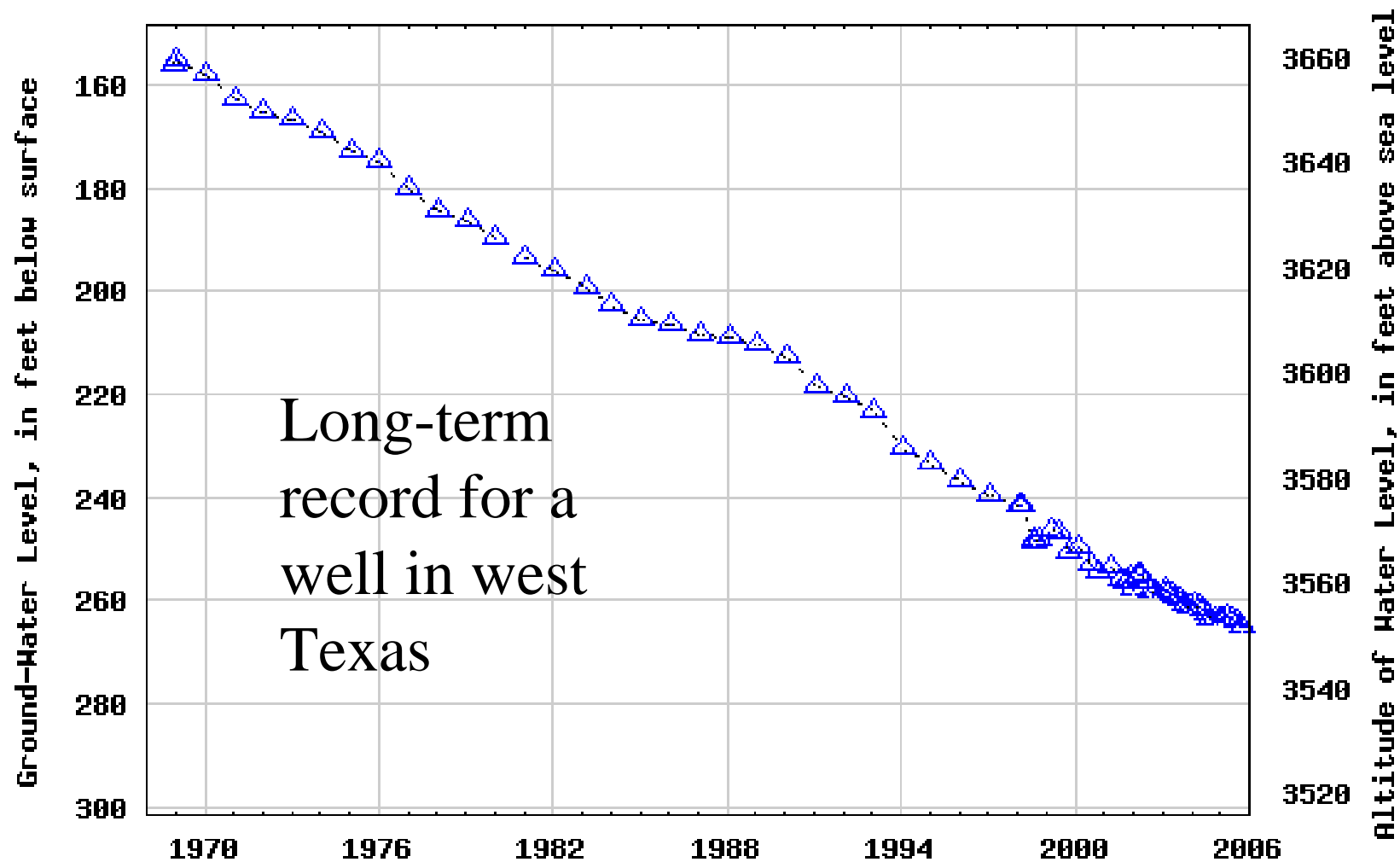


USGS 432910070399301 ME-YW807 Sanford, Maine



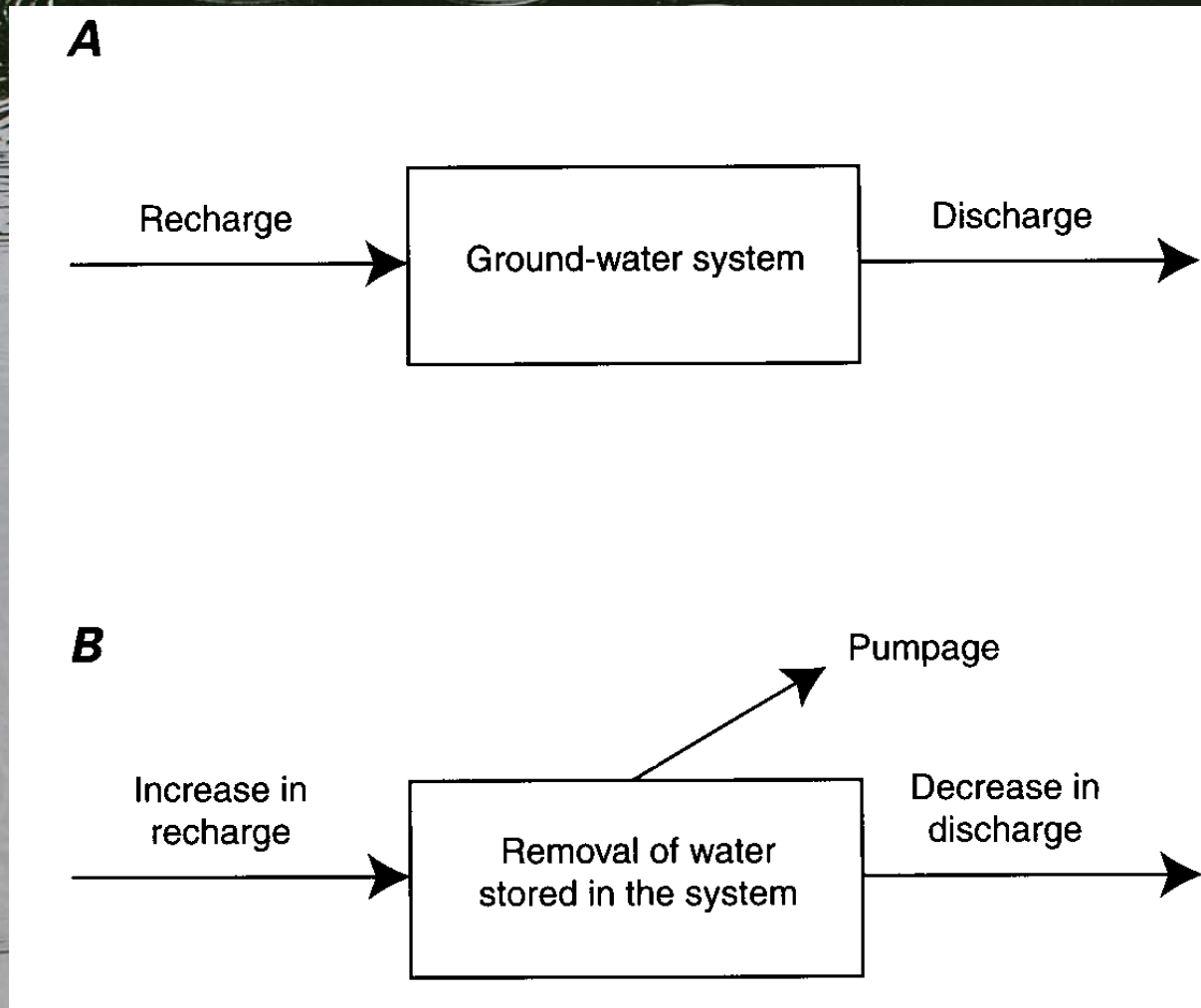
Provisional Data Subject to Revision

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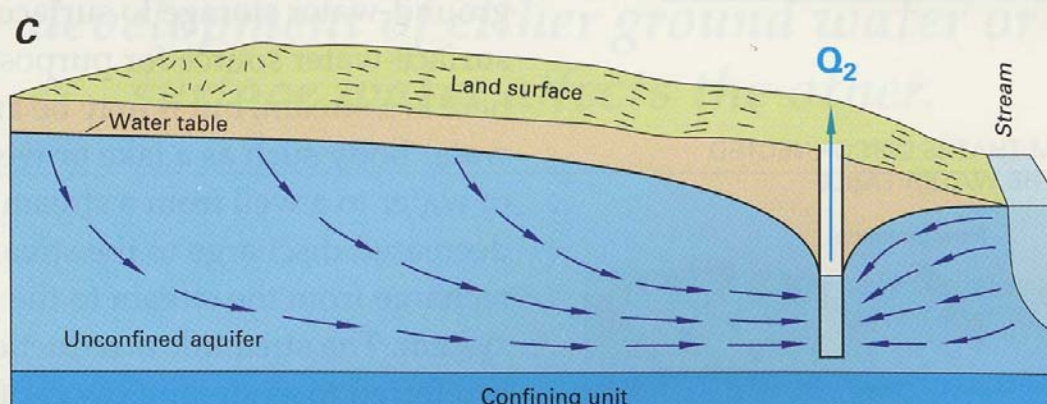
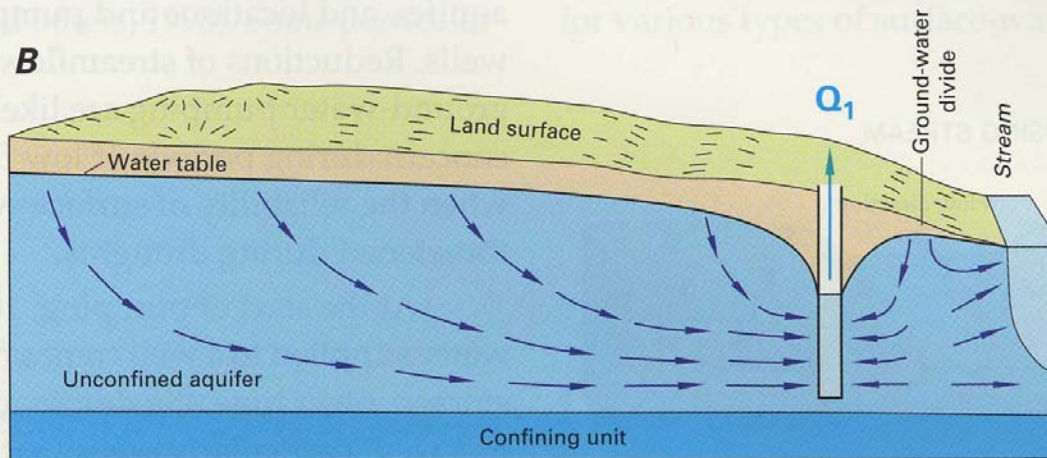
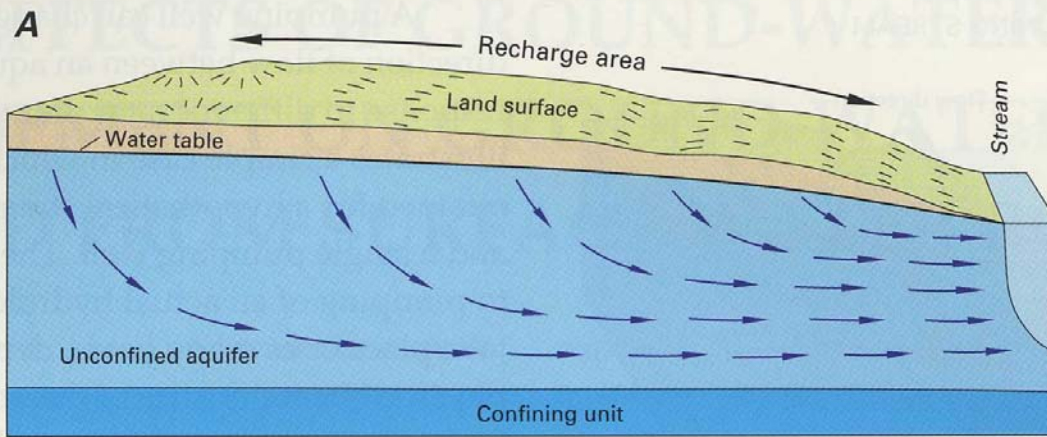
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Ground water / surface water interaction



Equilibrium

Pumping usually results in a combination of all of these effects



Impacts of pumping

(A) natural ground water flow. (B) At a lower rate of pumping the well intercepts water that would flow out to the stream. At a higher rate (C), the well draws water from the stream into the aquifer – induced recharge.

Useful websites

Aquifer information, maps from the Maine Geological Survey: www.state.me.us/doc/nrimc/mgs/mgs.htm

DEP Water use report:

<http://www.maine.gov/dep/blwq/report/05WaterWithdrawalReport.pdf>

USGS ground water network: <http://me.water.usgs.gov/>

USGS ground water information page:

<http://water.usgs.gov/ogw/>