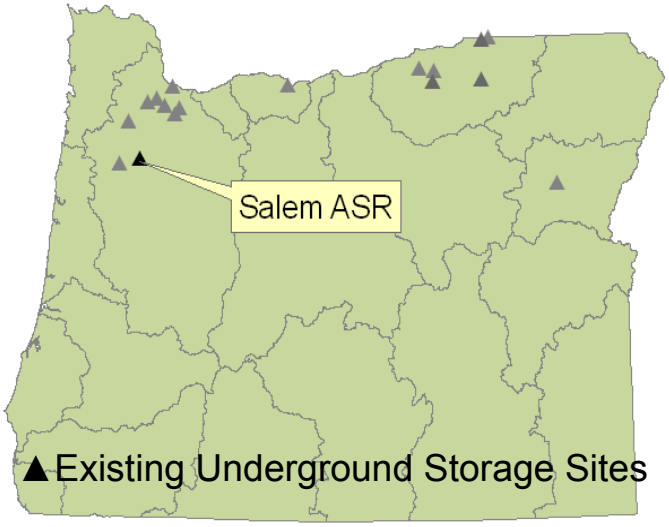
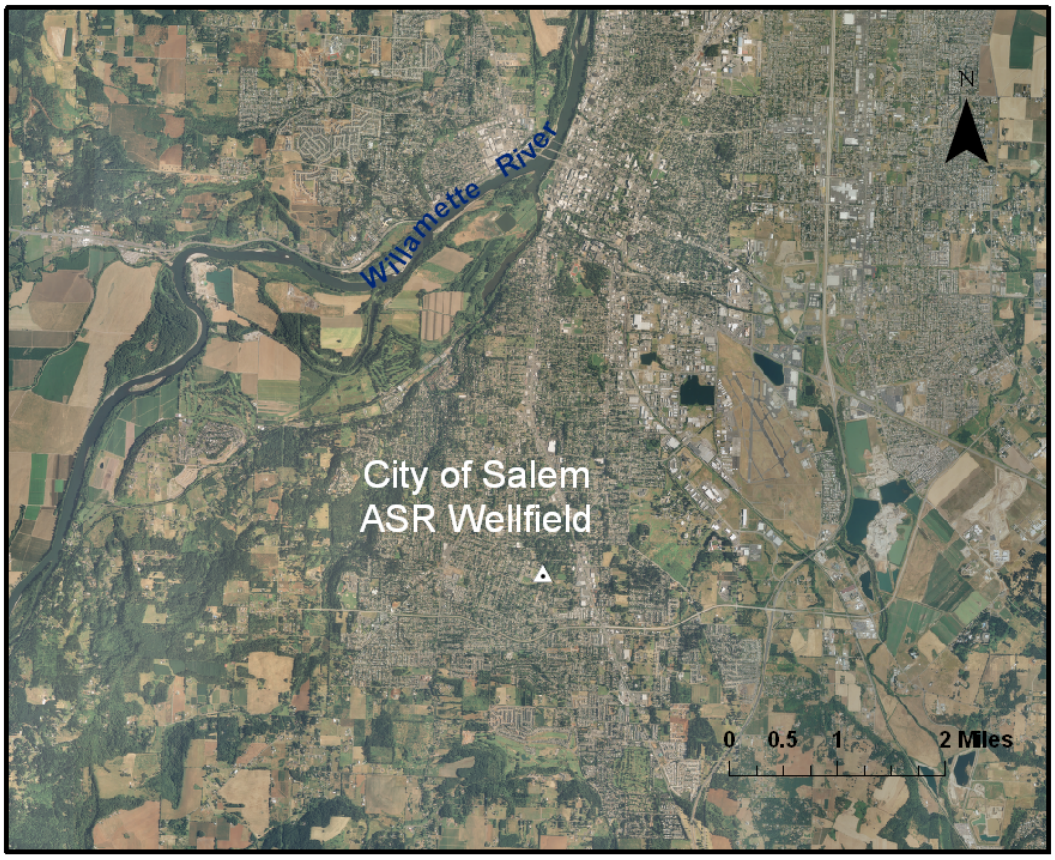
Oregon Underground Storage: Salem ASR

Background

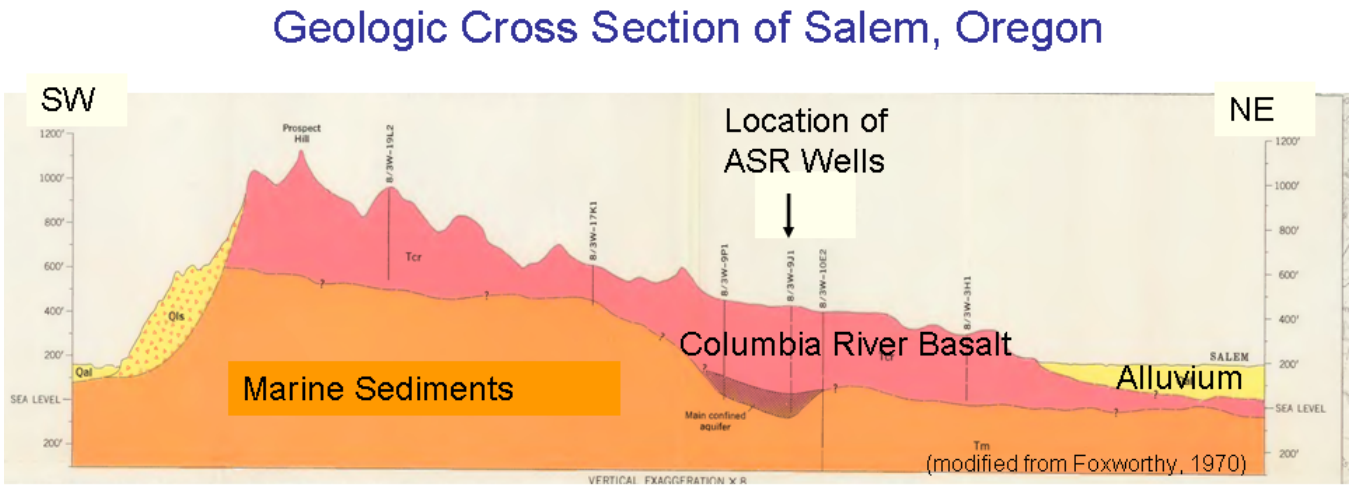
- Salem is located in the central Willamette Valley where annual precipitation averages over 40 inches.





- The City of Salem received the first limited license to test ASR in Oregon. It was issued in 1997, and renewed in 2002 and 2007. Historic testing by the US Geological Survey occurred in 1962.

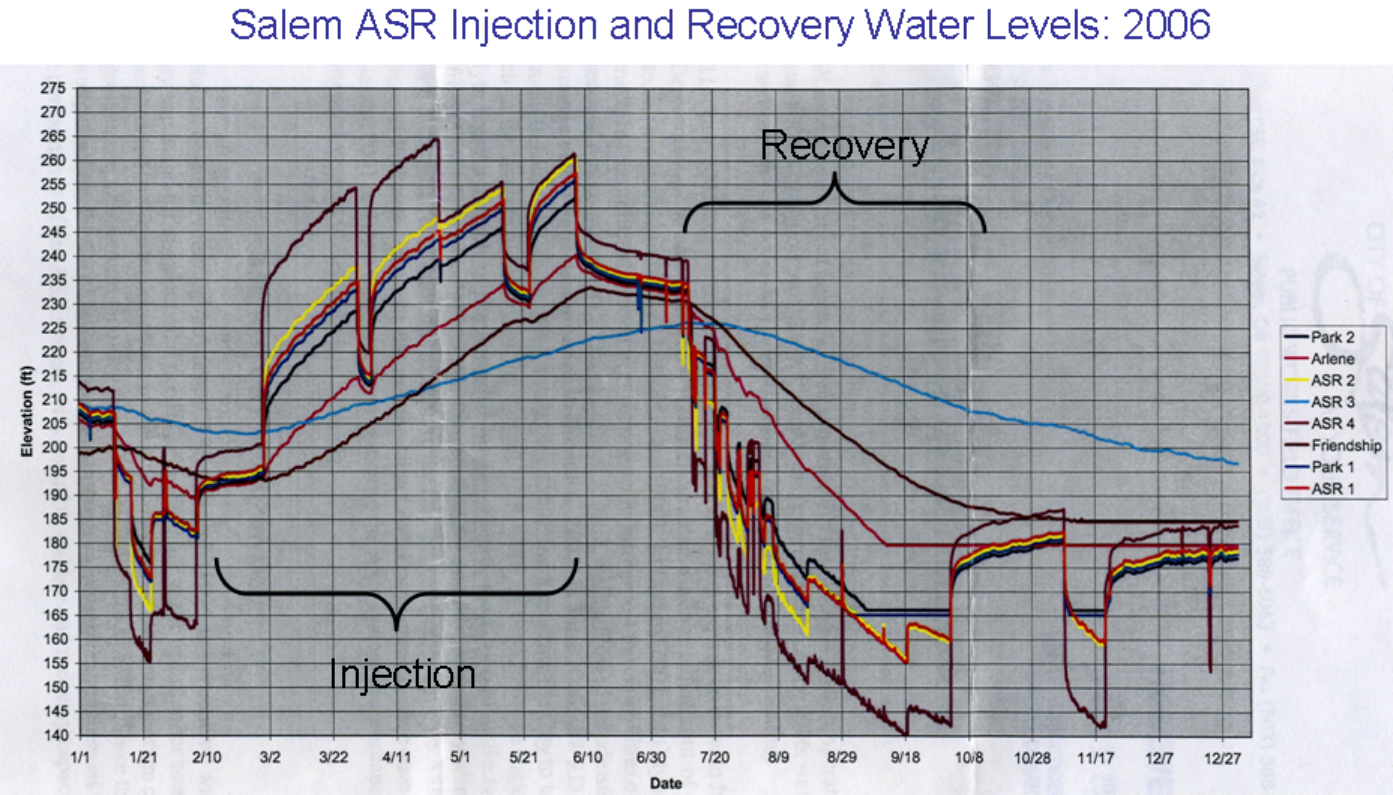
- **Source Water:** Recharge water comes from the North Santiam River, which provides much of the city's municipal supply. Water is diverted during high flow months, treated to drinking water quality and injected underground.



- **Aquifer:** Water is injected into a water-bearing layer of Columbia River Basalt which lies 350 feet below the surface the South Salem hills. This unit contains permeable layers between massive flow centers. These interflow zones often provide a suitable storage zone, because they are generally confined above and below by less permeable layers, but allow water to move horizontally through the aquifer.

One of the ASR well houses in South Salem's Woodmansee Park.

- **ASR:** Testing began in 1997 under the current limited license. The project is authorized to inject up to 17 million gallons per day through 15 wells, and 4 are currently in use for ASR. Stored water is withdrawn during high demand summer months to supplement municipal supply. Since 1997, injection has ranged from 0 to approximately 450 million gallons per year. Recovery ranges from 1.6 to 503 million gallons per year. In a given year, there may be more recovery than injection, or vice versa, because licensees can carry over a storage balance from the previous year (minus a small fraction lost to the aquifer environment).



Hydrographs at several ASR wells in Salem, Oregon illustrate water level response during injection and recovery cycles.