GROUNDWATER OVERPUMPING:

Searching for Innovative Solutions in Eastern Washington

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The basic problem:

- **25 cities with a combined population of 200,000 rely on wells for their supply**
    - Some towns could run out in 10 years
    - Little long-term planning
- **Several hundred thousand acres of farm land at risk, too**
    - If no solutions, farms may disappear
    - The problem is years in the making
- **Water mining -- the wells are being depleted**
- **There's virtually no recharge. Why?**
    - Little rain a year (e.g., 6-8 inches)
    - Layers of basalt separate the aquifers
    - Recharge almost always in upper levels only

A two-part problem: Farms and Cities

Each with its discrete challenges and potential solutions

PART 1: AGRICULTURE

Why isn't all of the area served by surface water?

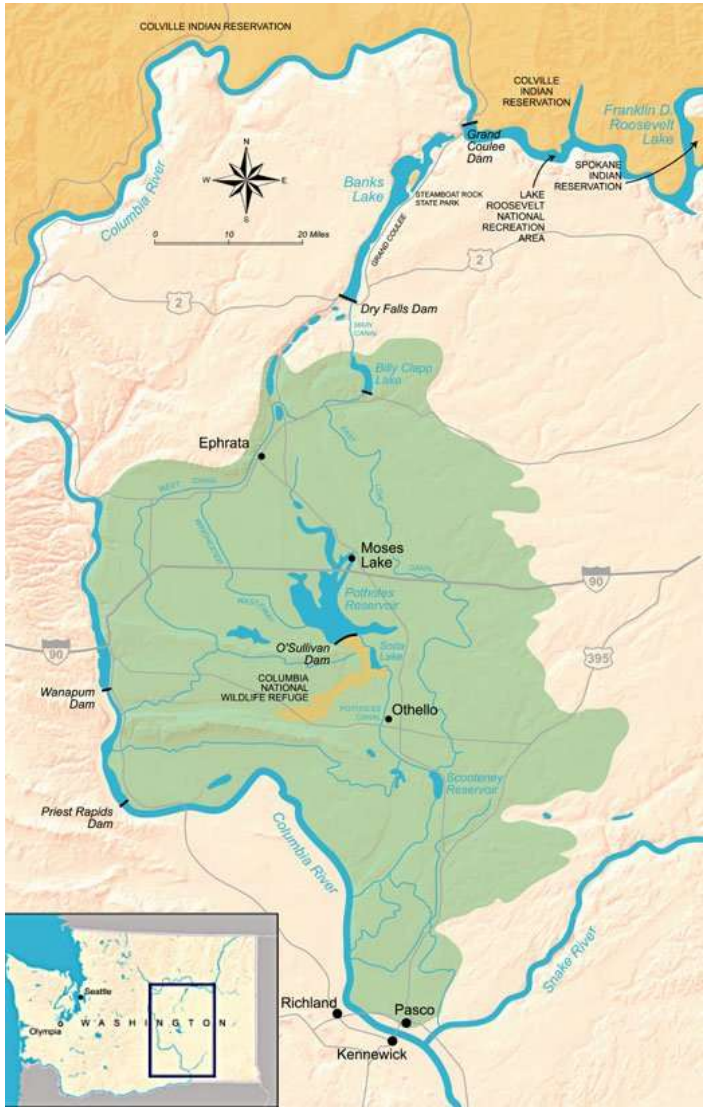
After all, it's the home to the Columbia Basin Project

- The largest federal irrigation project in the nation
- Built and owned by the U.S. Bureau of Reclamation

The answer:

Because the project was never finished

The Columbia Basin Project



The Columbia Basin Project

It moves water from Grand Coulee Dam south

- Originally proposed in 1917
- Construction on the dam began in 1934
- Construction on the irrigation infrastructure began after World II
- The original goal was to irrigate 1 million acres
- 667,000 irrigated now - roughly 2/3 of goal
- Elaborate plumbing
  - Multiple dams and storage areas
  - 300 miles of main canals
  - 3 major irrigation districts

The missing component:
The East High Canal system

- Too expensive
- Not cost effective
- The consensus: it won't ever be built by the federal government

That means many farms will continue to depend on groundwater unless something is done:

- The area east and uphill of the existing East Low Canal
- Groundwater was the alternative for farmers
- Potatoes, peas and other water-intensive crops
- Depletion started in the 1960s
- It has continued since then
- State water regulators knew of the risks
- Some farm wells are now over 2,000 feet deep
- Warm and sometimes even hot water comes up
- Salinity problem

What are the alternatives?

Two familiar choices:

- Drill deeper – beyond 2,000 feet in many cases
- Use surface water – a seasonal source

Solutions are hampered by:

- Multiple parties are involved
- Financial hurdles
- Complex legal arrangements

The main focus is now on a subregion called the Odessa special study area

Goal: to switch about 87,700 acres from ground water to surface water

- A discrete part of the Columbia Basin – east of East Low Canal
- Roughly 25% of the area not served in the Columbia Basin Project
- It's the area of the greatest water declines
- If nothing happens, 35% of wells would cease production by 2020
- $840 million and 3,600 jobs will likely be lost

The State of Washington's efforts

The Legislature passed a 2006 statute, RCW 90.90

- It created a pot of money of $200 million

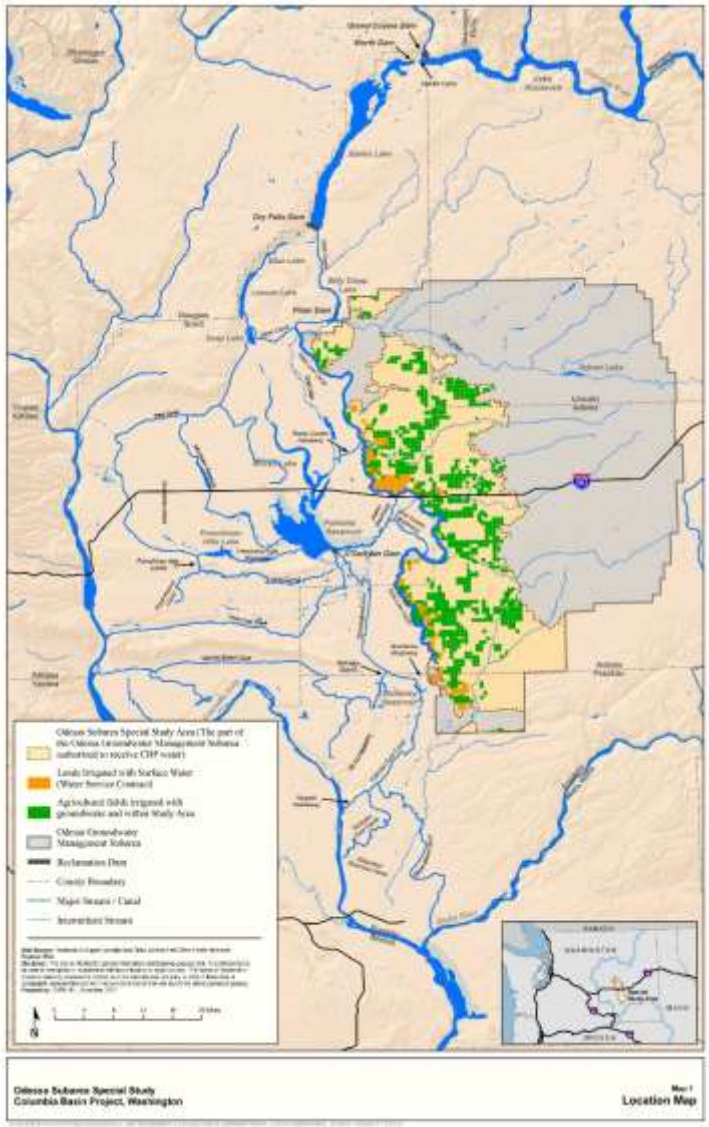
  One of the purposes:
  "to find alternatives to groundwater for agriculture users in the Odessa subarea aquifer"

- It created DOE's Office of Columbia River
  - OCR has obtained more water from behind Grand Coulee Dam
  - OCR has paid for expanding the East Low Canal
  - OCR has paid for studies
  - OCR has attempted to facilitate solutions
- But OCR is an anomaly – it thinks differently than DOE's regulatory side

  A split personality

The Odessa special study area

(declines in groundwater level)



Where would the water come from?

Banks Lake – perpendicular to Grand Coulee Dam

DOE has leased additional water from the U.S. Bureau of Reclamation

- A total of 164,000 acre feet
- It would send water south in the East Low Canal
- Requirements to get service
  - The lands must be in the Columbia Basin Project
  - Must have a valid state-issued groundwater right
  - Landowners must be able to enter into a contract

But who builds the distribution system?
Who actually delivers the water to farmers?

Not clear

Competing proposals

- East Columbia Basin Irrigation District (“ECBID”)
  - First infrastructure completed
  - Completion date: 4-5 years
  - Goal to irrigate 87,700 acres
- The potential role of private capital – the first time in 100 years
    - The Columbia-Snake River Irrigators Association (“CSRIA”) proposal
    - Obtained $42 million in financing for the first phase (15,000 acres)
    - The first phase could be finished in roughly two years
    - But the Bureau and ECBID object: legal issues

That’s where things stand now

PART 2: CITIES AND TOWNS

A similar (but not identical) problem for cities and towns

Sounding the alarm

The role of the Ground Water Management Area ("GWMA")

- Formed in 1998
- Agreement between Adams, Franklin, Grant and Lincoln Counties
- Covers 8,300 square miles
- Includes areas outside of the Columbia Basin Project
- The goal is to understand the over pumping problem – it has no regulatory powers
- Funded studies
- Identified the coming crisis
  - We don't have good data on about 25% of all city wells
  - 40% of municipal wells (where there is data) show rates of decline more than 2 feet/year
  - 43% have already declined by more than 100 feet
  - Little or no recharge
- Fighting parochialism and the old way of doing business

For cities, the solution for farmers in the Odessa doesn't necessarily help

Why?

- Problem 1: The largest city, Moses Lake, is outside of the Odessa
- Problem 2: Need to find new Municipal and Industrial ("M&I") water
- Problem 3: Limitations on use of canals in off season (November through March)
- Problem 4: Water quality – some treatment required
- Problem 5: Legal issues

The historical practice of cities/towns was to rely on groundwater

- Once considered abundant
- Good water quality
- Cheap

What happens if they run out?

Drill deeper – that was historic solution

- Average age: the water is 10,000 to 25,000 years old
- The deeper the well, the less recharge
- Temperature problems
- Salinity problems

How old is the water?

City	Years
Odessa	26,250
Lind	24,760
Othello	24,400
Davenport	23,070
Royal City	22,230
Sprague	18,370
Ritzville	15,520
Reardon	14,970
Moses Lake	13,420
Soap Lake	12,590
Washtucna	11,240
Almira	9,350
Ephrata	7,320
Mattawa	7,020
Soap Lake	12,590
Washtucna	11,240

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Almira	9,350
Ephrata	7,320
Mattawa	7,020
Wilbur	5,100
Connell	3,730
Warden	3,500
Creston	2,460
George	1,980
Quincy	1,580
Wilson Creek	Old
Hatton	Old
Kahlotus	Old
Mesa	Modern
Harrington	Modern

Note: *Based on the average age of water*

The City of Moses Lake – an example

- Growing population
- It's in the Columbia Basin Project
- To the west of the Odessa
- Summer use is four times winter use
- The city relies on 19 wells
- The current rate of demand exceeds supply at all locations
- Average drop of 3-4 feet a year since 1959
- Deepest well is 1,200 feet
- 83 degrees when pumped up
- Another problem – TCE pollution from nearby Larson Air Force Base
- Some recharge of alluvial areas near the surface

Potential solutions for the city

- Moses Lake itself
- Ground water mounds
    - Alluvial source primarily from irrigation runoff
    - Water quality problems
    - *"What rains today will be what we drink in 3 or 4 days"*
- New "Municipal and Industrial" water released by Ecology or the Bureau of Reclamation
- Not counting on Odessa infrastructure as a solution

The aquifer storage and recovery option for cities

- “Firming” up seasonal supplies
- Collaboration among cities, irrigation districts and the Bureau of Reclamation
- Costs include pumping water back up
- Treatment is necessary

Water efficiency -- the untapped option

- Education – telling the public what's going on
- The benefits of tiered rates
- Would it buy time? How much?

Conclusion

- Opportunity for creative approaches
- Unfortunately, innovation costs money
- Water bills will go up
- Fighting the momentum of the status quo

Thank you. Questions?

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