AGENDA
IDAHO WATER RESOURCE BOARD
Water Supply Management Committee Meeting No. 1-22
Tuesday, February 15, 2022
1:00 p.m. (MT)

Water Center
Conference Rooms 602 C&D / Online Zoom Meeting
322 E. Front St.
BOISE

Board Members & the Public may participate via Zoom
Click here to join our Zoom Meeting
Dial in Option: 1(253) 215-8782
Meeting ID: 849 8989 8320 Passcode: 906332

1. Introductions and Attendance
2. ESPA-IWRB Recharge Impacts
3. Other Items
4. Adjourn

Committee Members: Chair Jeff Raybould, Roger Chase, Brian Olmstead, and Dean Stevenson.

* Action Item: A vote regarding this item may be made this meeting. Identifying an item as an action item on the agenda does not require a vote to be taken on the item.

Americans with Disabilities
The meeting will be held telephonically. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email jennifer.strange@idwr.idaho.gov or by phone at (208) 287-4800.
Current and Future Benefits of Aquifer Management

Noah Stewart-Maddox
Overview

2021 Drought

2021 was an exceptionally dry year

Current Recharge

There has been a significant amount of recharge over the past several years

Future Recharge

How long will it take for the full effects of recharge to appear?
- Current program has only been active a few years
- Will take decades to see the full benefits of managed recharge

Aquifer Metrics

What does this mean for the near future?
- Recharge will continue to increase aquifer volume, reach gains, and spring gains
- We use a variety of metrics to answer different questions related to the aquifer’s health
  - Aquifer Volume
  - Thousand Springs Flow
  - Near Blackfoot reach gains
  - Sentinel Index

New Sites

Added 500 CFS of additional capacity to the Lower Valley, based on potential new sites

Conclusions

- The ISPAP took decades to decline to its current levels
  - It will take decades to reverse the trend and return to sustainable levels
- Changes in aquifer management have improved conditions
  - We are stabilizing and building on top of the aquifer
- Different metrics track different portions of the aquifer’s health
2021 was an exceptionally dry year
Swan Falls almost fell below the minimum streamflow
The sentinel index decreased last year.
Aquifer storage declined as well
Since 2014, aquifer conditions have improved, but there are still significant issues.
There has been a significant amount of recharge over the past several years.
How has this recharge impacted the aquifer?
Where is the recharged water going?

Recharge: 1.8 MAF

Storage: 1.1 MAF
Spring Gains: 310 KAF
Reach Gains: 370 KAF
Where is the recharged water going?
Ashton to Rexburg

Reach Gain (CFS)

- Henrys Fork: 97.8%
- South Fork: 1.9%
- Main Stem: 0.3%
- Lower Valley: 0.0%
Shelley to near Blackfoot
near Blackfoot to Neeley
Thousand Springs

- Henrys Fork: 0.0%
- South Fork: 0.0%
- Main Stem: 0.0%
- Lower Valley: 100.0%
A combination of wet years and changes in aquifer management have resulted in an increased sentinel index.
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How long will it take for the full effects of recharge to appear?

• Current program has only been active a few years

• Will take decades to see the full benefits of managed recharge
5-Year retention is a metric of the ability of recharge to build up over time.
Average travel time can be calculated for each reach

Half of the water that goes to Thousand Springs arrives within 3 years

Almost 60% of the recharge at MP31 goes to Thousand Springs
Average travel time can be calculated for each reach.

- Almost 30% of the recharge at MP31 goes to Blackfoot to Neeley.
- Half of the water that goes to Blackfoot to Neeley takes 10 years to arrive.
In the long term, Where does recharged water end up? (Lower Valley)
Where does Main Stem recharge end up?

- **Heise to Shelley**
  - Proportion: 9%
  - Average Travel Time: 2.2 years

- **Near Blackfoot to Neeley**
  - Proportion: 34%
  - Average Travel Time: 2.3 years

- **Shelley to near Blackfoot**
  - Proportion: 53%
  - Average Travel Time: 5 months
Where does South Fork recharge end up?

- **Heise to Shelley**
  - Proportion: 44%
  - Average Travel Time: 5 Months

- **Shelley to near Blackfoot**
  - Proportion: 20%
  - Average Travel Time: 1.4 Years

- **Near Blackfoot to Neeley**
  - Proportion: 30%
  - Average Travel Time: 2.1 Years
Where does Henry’s Fork recharge end up?

- **Ashton to Rexburg**
  - Proportion: 61%
  - Average Travel Time: 1.2 Years

- **Near Blackfoot to Neeley**
  - Proportion: 9%
  - Average Travel Time: 9.7 Years

- **Heise to Shelley**
  - Proportion: 25%
  - Average Travel Time: 2.3 Years
How would this look in practice?

- Modeled effects of managed recharge from 1991-2020
  - Used historical recharge availability from 1991-2020
  - Combined with current (2021) recharge capacity
  - Used an estimated downtime term
If recharge started in 1991, what would it look like today?
If recharge started in 1991, what would the effects be?

It takes nearly ten years for spring and reach gains to stabilize.
If recharge and conservation started in 1991, what would it look like today?
What does this mean for the near future?

• Recharge will continue to increase aquifer volume, reach gains, and spring gains

• We use a variety of metrics to answer different questions related to the ESPA’s health:
  • Aquifer Volume
  • Thousand Springs flows
  • Near Blackfoot reach gains
  • Sentinel Index
Aquifer volume is one of the most responsive metrics.

Water Level Change - Spring 2015 To Spring 2021
with Sentinel Well Locations

2,300,000 AF

279 Wells
The aquifer volume is well correlated to flow at Thousand Springs.
Near Blackfoot to Minidoka reach gains are very important to water users.
How are reach gains calculated?

River Reach with a Reservoir

Reach Gain = Outflow – Inflow + Evaporation + Change in Storage
Measuring the reach gains near American Falls is difficult due to the reservoir
The sentinel index was chosen because by comparison it is easier to measure a well
It will take time for the reach gains and sentinel index to increase.
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Site Expansion

Added 500 CFS of additional capacity to the Upper Valley based on potential new sites.
Increases Due to New Potential Sites

1991 Nov

Map showing new potential sites with gains (CFS) indicated by color coding.

Graphs showing gains (CFS) and sentinel increase (ft) over time from 1992 to 2020.

Legend:
- Reaches
- Springs
Conclusions

• The ESPA took decades to decline to its current levels
  • It will take decades to reverse this trend and return to sustainable levels

• Changes in aquifer management have improved conditions
  • We are stabilizing and building on top of the aquifer

• Different metrics track different portions of the aquifer’s health
Questions?