AGENDA

IDAHO WATER RESOURCE BOARD

Aquifer Stabilization Committee Meeting No. 1-21
Friday, August 27, 2021
1:00 p.m. (MST)

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: 949 9537 6541 Passcode: 445625

1. Introductions and Attendance
2. Groundwater Model Development Status
3. ESPA Recharge Analysis
4. Large Upper Valley Recharge Projects Update
5. ESPA Recharge Program Standards and Procedures
6. Other Items
7. Adjourn

Committee Members: Chair Dean Stevenson, Al Barker, Brian Olmstead, and Pete Van Der Meulen

* 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.

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098
Phone: (208) 287-4800 Fax: (208) 287-6700 Website: idwr.idaho.gov/IWRB/

Update on Groundwater Flow Model Development Projects

Presented to the IWRB Aquifer Stabilization Committee by Sean Vincent
August 16, 2021

IDWR

Elmore County Request to Expand the Treasure Valley Groundwater Model to the Mountain Home Plateau

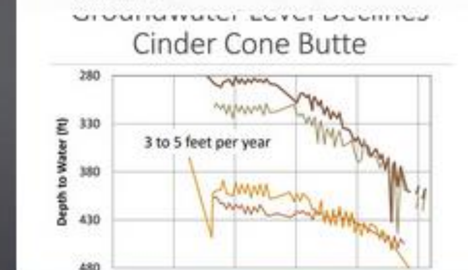
IDAHO WATER RESOURCE BOARD

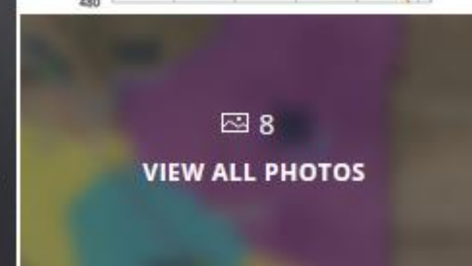
MAY 21, 2021

TERRY SCANLAN, P.E., P.G.
SPF WATER ENGINEERING, LLC

As Mountain Home Plateau Aquifer declines, officials search for water resource solutions

by Sarah Jacobsen | Wednesday, July 7th 2021





As Mountain Home Plateau Aquifer declines, officials search for water resource solutions (Photo Courtesy: Sarah Jacobsen)

Overview

- Existing groundwater flow models (3 plus 1 in progress)
- Proposed new groundwater flow models
  - Big Lost River basin
  - Mountain Home Plateau
- Resource considerations
- Initial plan of attack

Existing GW Flow Model #1 - SVRP

- EPA sole source aquifer designation
- Interstate resource
- Developed by USGS in collaboration w/ the states
- Data collection ongoing but model recalibration on hold by agreement w/ State of Washington
  - Meet annually Washington DOE to discuss modeling and data collection

USGS
science for a changing world

Prepared in cooperation with the
IDAHO DEPARTMENT OF WATER RESOURCES
WASHINGTON STATE DEPARTMENT OF ECOLOGY
UNIVERSITY OF IDAHO
WASHINGTON STATE UNIVERSITY

IDWR
WASHINGTON STATE DEPARTMENT OF ECOLOGY
WASHINGTON STATE UNIVERSITY
University of Idaho

Ground-Water Flow Model for the Spokane Valley-Rathdrum Prairie Aquifer, Spokane County, Washington, and Bonner and Kootenai Counties, Idaho

Existing GW Flow Model #2 - ESPAM

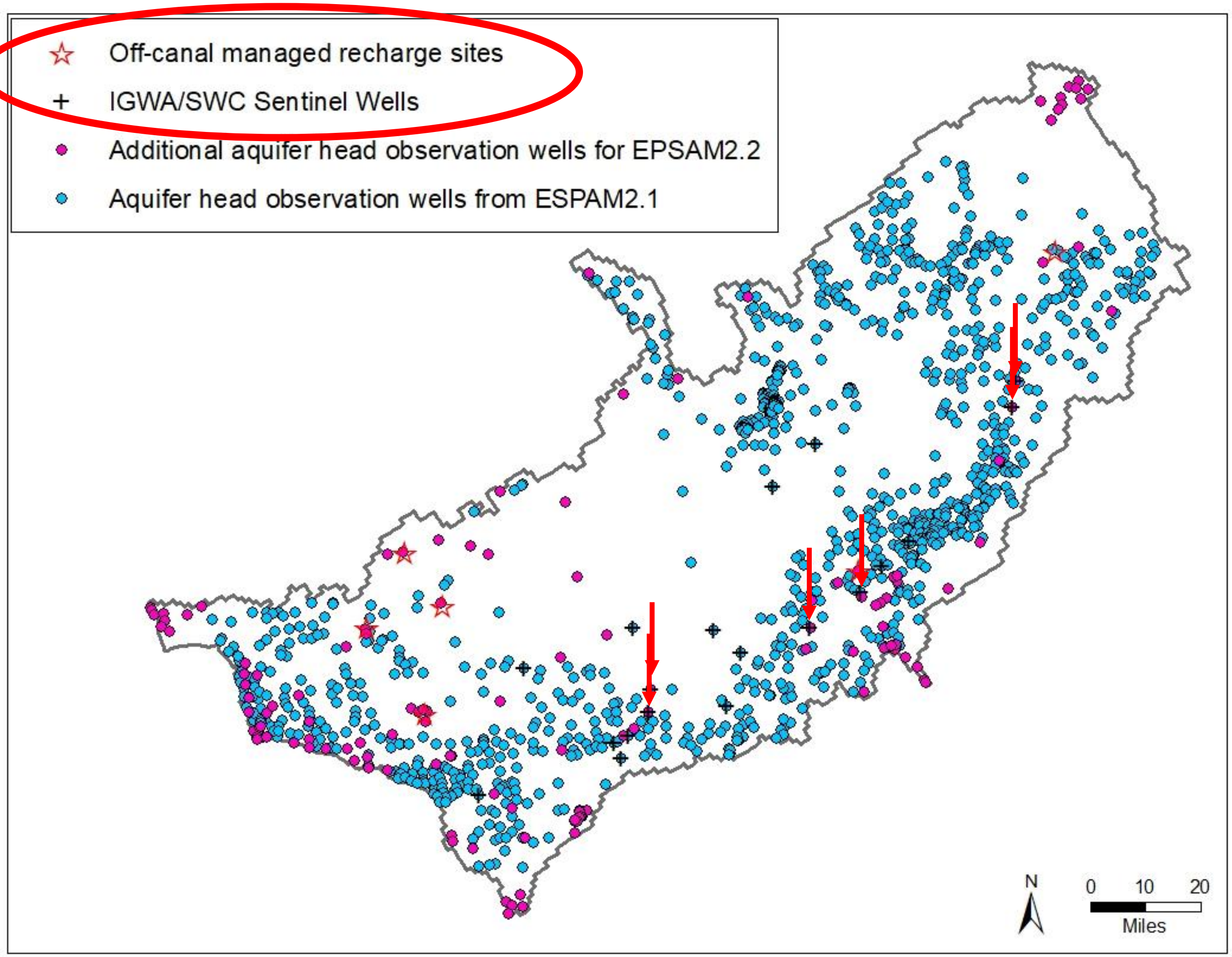
- ESHMC agreed by consensus to adopt latest calibration run as new model version 2.2 at October 28, 2020 meeting

- Met on August 24, 2021
  - ESPA storage change calculation (McVay) and modeled benefits from conservation plus recharge (Stewart-Maddox)
  - Solicited recommendations for next model version

Model refinements – extended calibration period

- Extended model calibration period to include water years 2009 through 2018
  - Additional variation in climate, water supply, and water use
  - Early years of the new era of managed recharge projects
  - Early years of the SWC/IGWA settlement agreement
  - New aquifer-head observation locations associated with the IWRB managed recharge program, SEP-funded well construction, and collaboration with water users
  - New return flow measurement sites established in collaboration with water users
  - New reach gain measurement locations established in collaboration with the Shoshone-Bannock Tribes
  - 10 years of additional data collected as part of IDWR and IWRB's ongoing ESPA monitoring program
- Calibration period increased from 23.5 years to 33.5 years
- Weighted calibration targets increased from 51,679 to 76,331 observations

Model refinements – new head observation locations



Existing GW Flow Model #3 – Wood River Valley

- Version 1.0 documented in 2016
- Version 1.1 documented in 2019
  - Incorporates high frequency head and flow measurements collected between 2011 and 2014 and extends calibration period to 20 years (Jan 1995 - Dec 2014)
- Version 1.1 used to evaluate pumping curtailment scenarios for the Water District 37 matter

Coming Soon Model - Treasure Valley

- New transient model builds on steady-state TVHP model
- Collaboration w/ U.S. Geological Survey
- MTAC for stakeholder input and data sharing

MTAC meeting

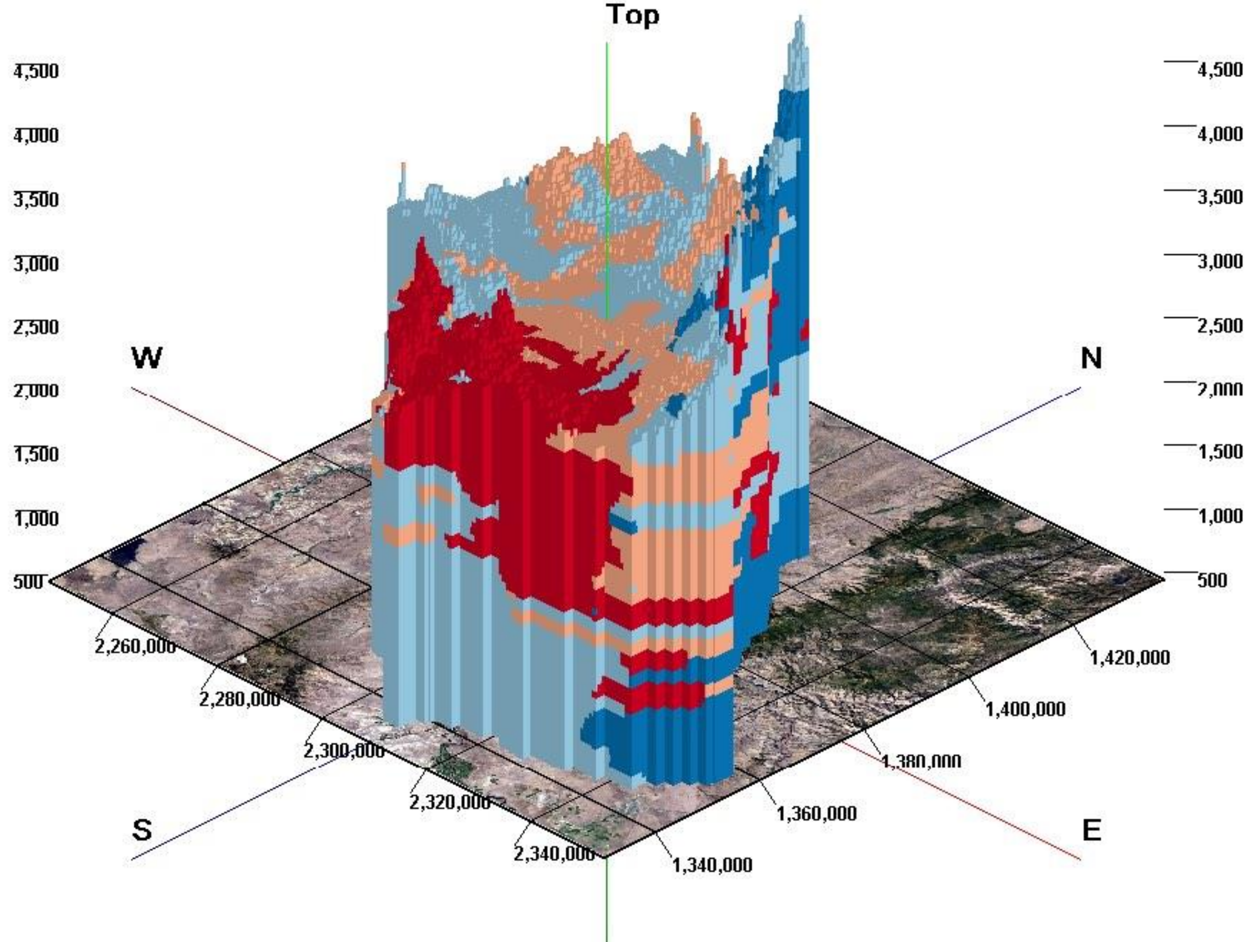
Coming Soon Model - Treasure Valley

- New transient model builds on steady-state TVHP model
- Collaboration w/ U.S. Geological Survey
- MTAC for stakeholder input and data sharing
- In last year of 5-year project which includes a extensive data collection/analysis and development of a hydrogeologic framework

Geologic Model

Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon

J.R. Bartolino, USGS, Idaho Water Science Center



Hydrogeologic unit

- BAS: Basalt, undifferentiated: includes Pliocene-Pleistocene and Miocene basalts
- CGF: Coarse-grained fluvial and alluvial deposits
- FGL: Fine-grained lacustrine deposits
- GRB: Granitic and rhyolitic bedrock

20X vertical exageration

Vertical scale is feet above datum

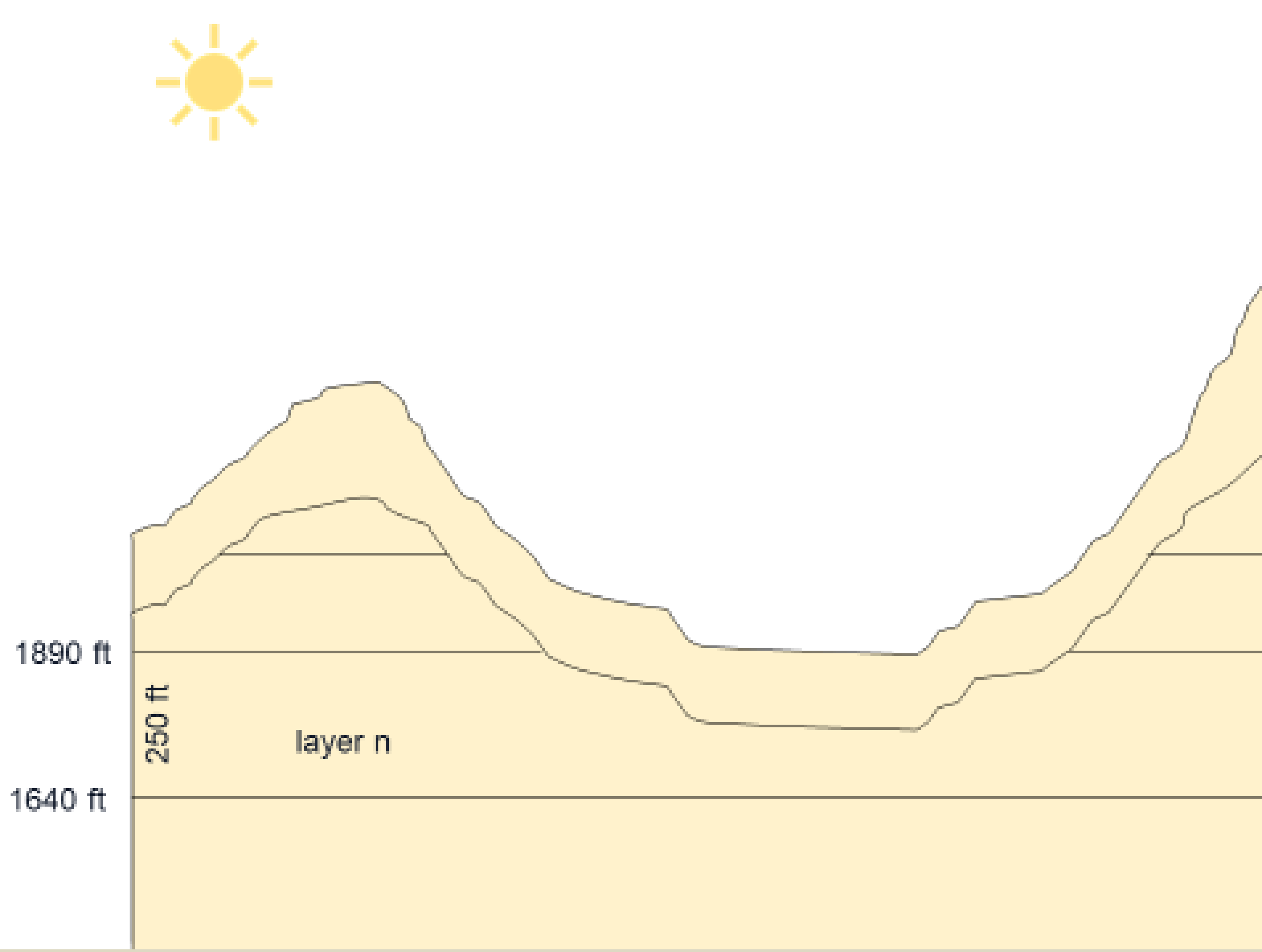
Horizontal scale is Idaho UTM meters

USGS

science for a changing world

6-layer model w/ layering based on geology and vertical water level gradients

Flow model layer



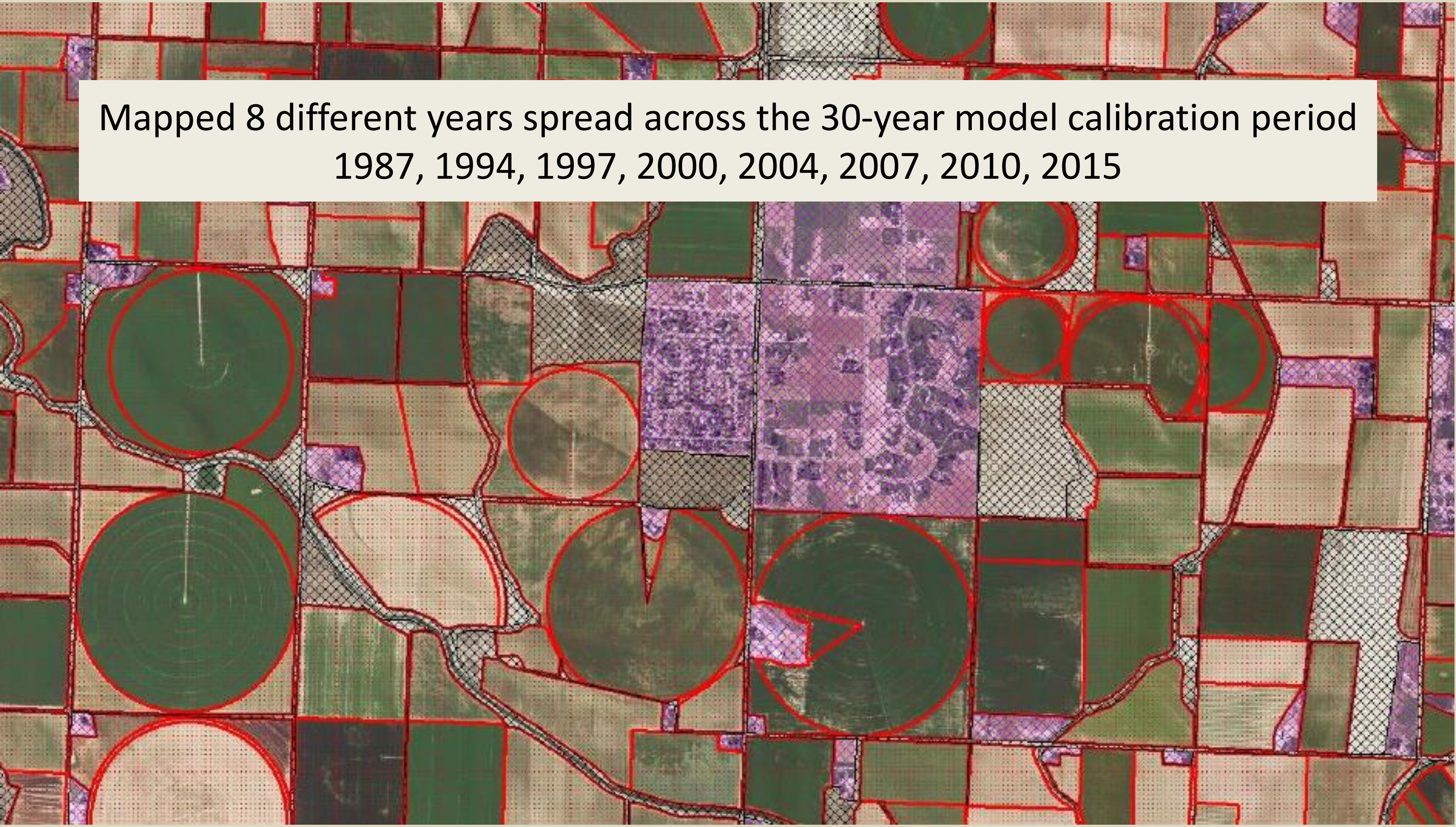
USGS
science for a changing world

Evapotranspiration Determination Method

Year	Method	Year	Method	Year	Method
1986	non-METRIC	1996	non-METRIC	2006	non-METRIC
1987	METRIC	1997	METRIC	2007	METRIC
1988	non-METRIC	1998	non-METRIC	2008	non-METRIC
1989	non-METRIC	1999	non-METRIC	2009	non-METRIC
1990	non-METRIC	2000	METRIC	2010	METRIC
1991	non-METRIC	2001	non-METRIC	2011	non-METRIC
1992	non-METRIC	2002	non-METRIC	2012	non-METRIC
1993	non-METRIC	2003	non-METRIC	2013	non-METRIC
1994	METRIC	2004	METRIC	2014	non-METRIC
1995	non-METRIC	2005	non-METRIC	2015	METRIC

8 METRIC years (over 100 images); 22 nonMETRIC years

Mapped 8 different years spread across the 30-year model calibration period
1987, 1994, 1997, 2000, 2004, 2007, 2010, 2015



Coming Soon Model - Treasure Valley

- New transient model builds on steady-state TVHP model
- Collaboration w/ U.S. Geological Survey
- MTAC for stakeholder input and data sharing
- In last year of 5-year project which includes hydrologic data collection/analysis, METRIC ET processing, and hydrogeologic framework
- Outstanding tasks are model calibration and documentation
  - ✓ On track for calibrated model by end of 2021
  - ✓ No-cost extension for documentation

Proposed model #1 - Big Lost River basin

- Aquifer system is tributary to ESPA
- Big Lost water users petitioned Director to establish GWMA
- Basin below Mackay Dam is w/in ESPAM model but river not explicitly represented and 1-layer, 1-mile grid cell representation inadequate to evaluate intra-basin issues

Proposed model #1 - Big Lost River basin

- Developing Hydrogeologic Framework and Water Budget as part of DOE Supplemental Environmental Project grant
  - Final reports due December 31, 2021

Big Lost Project Components

SEP #2: Big Lost

- Stream gaging
- Seepage runs
- Piezometers
- Geophysics
- Water quality
- Agrimet station
- Hydrogeologic framework
- Water budget

Proposed model #1 - Big Lost River basin

- Developing Hydrogeologic Framework and Water Budget as part of DOE Supplemental Environmental Project grant
  - Final reports due December 31, 2021

- Discussed follow-on model development project w/ USGS
  - Estimate ~2.5-year effort

Proposed Model #2 - Mtn Home Plateau

- Contingent from Elmore County addressed the Board during Public Comment at the May 21 Board meeting
  - Consultant stated model is necessary to address ongoing water supply problems
  - Also advocated to extend the new Treasure Valley model (when finished) to include the Mountain Home Plateau aquifer system
- Data adequacy needs to be assessed
- Need to refine modeling objectives
  - Facilitating Conjunctive Administration not a primary motivation

Resource Considerations

- 3 existing groundwater models to maintain + one model still in development by USGS/IDWR
  - Goal to recalibrate existing models ~ 1x/5 years
- IDWR applies and maintains models
  - 4 groundwater modelers
  - Other staff assigned to collect model input data
- USGS often called on to lead model development
  - USGS currently wrapping up TV model

Resource Considerations (cont'd)

- Technical Advisory Committees slow progress but are generally necessary for buy-in from the water user community
- Extending the TV model to include Mtn Home Plateau might require hiring an additional remote sensing analyst
- Internal and external modeling staff can currently only work on one new model at a time but other staff can lay the groundwork for a different model

Initial Plan of Attack

- Begin ET processing and irrigated/non-irrigated land delineation work for Mtn. Home Plateau ASAP using IDWR staff

- JFA w/ USGS to assess data adequacy, fill data gaps, and develop Hydrogeologic Framework for Mtn. Home Plateau upon completion of Big Lost SEP (end of 2021)

- JFA w/ USGS to begin Big Lost model upon completion of new TV model development project next spring


Questions?

Benefits of Managed Recharge

Noah Stewart-Maddox

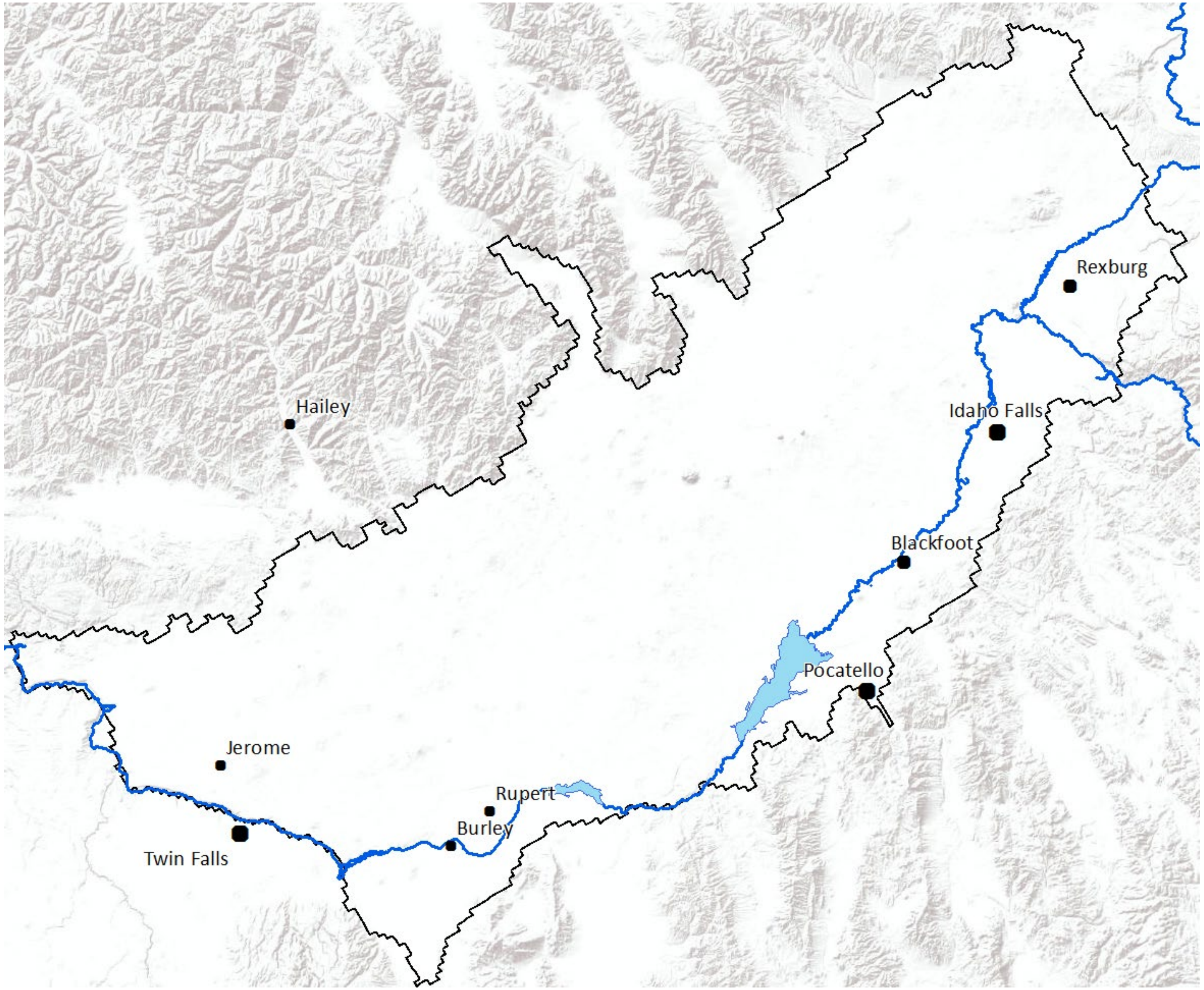
Introduction

- There are a multitude of questions that go into determining the benefits of recharge at a specific location

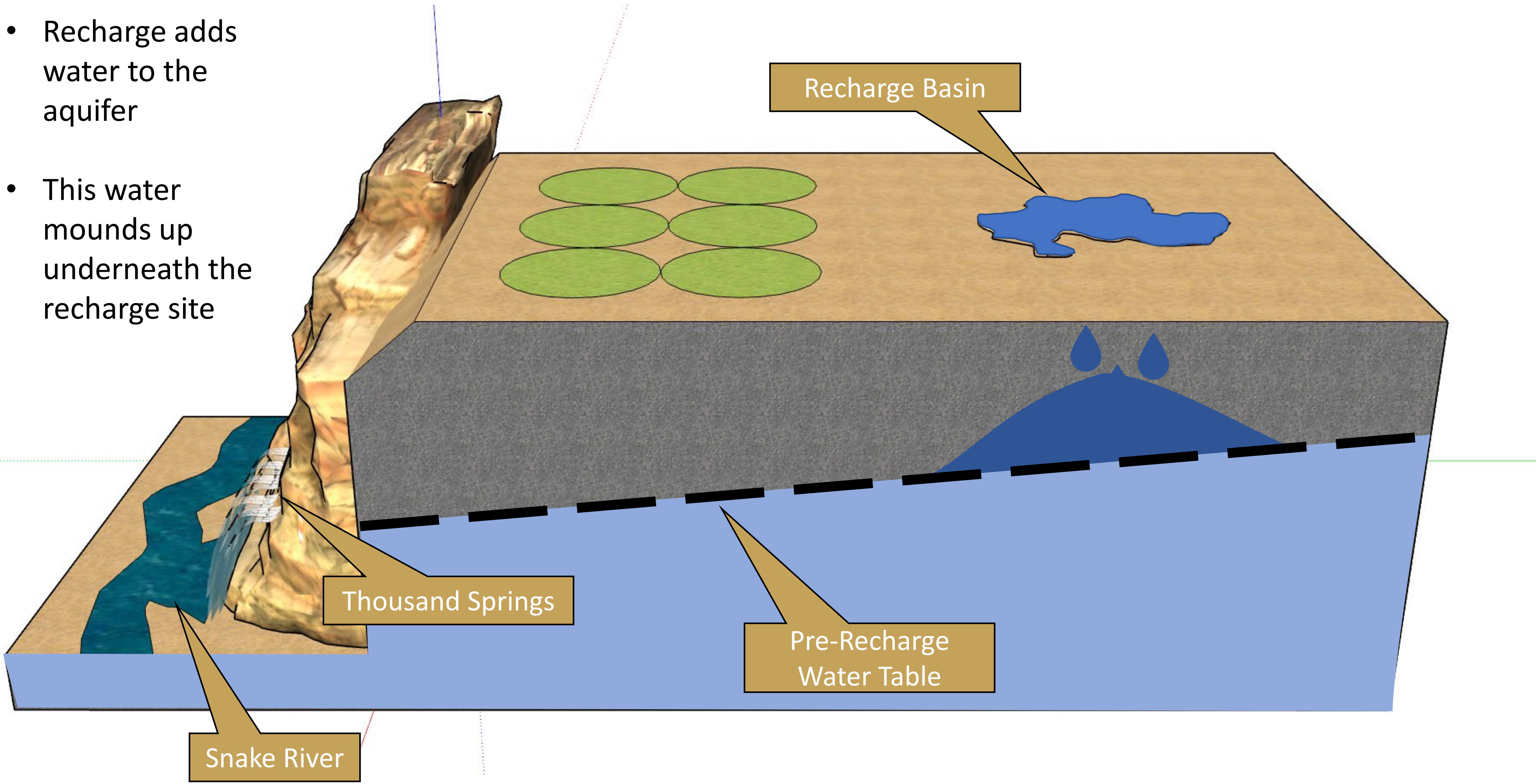
- In this presentation, we will be focusing on three questions related to IWRB Recharge:
    - How will recharge at this area help rebuild the aquifer?
    - When does most of the water leave the aquifer?
    - When recharge leaves the aquifer, who benefits?

ESPAM v2.2 changes

- Extended calibration period from 2009 through 2018
  - Now incorporates data when large-scale IWRB recharge occurred
- Improved river and spring representation
- Other additional changes

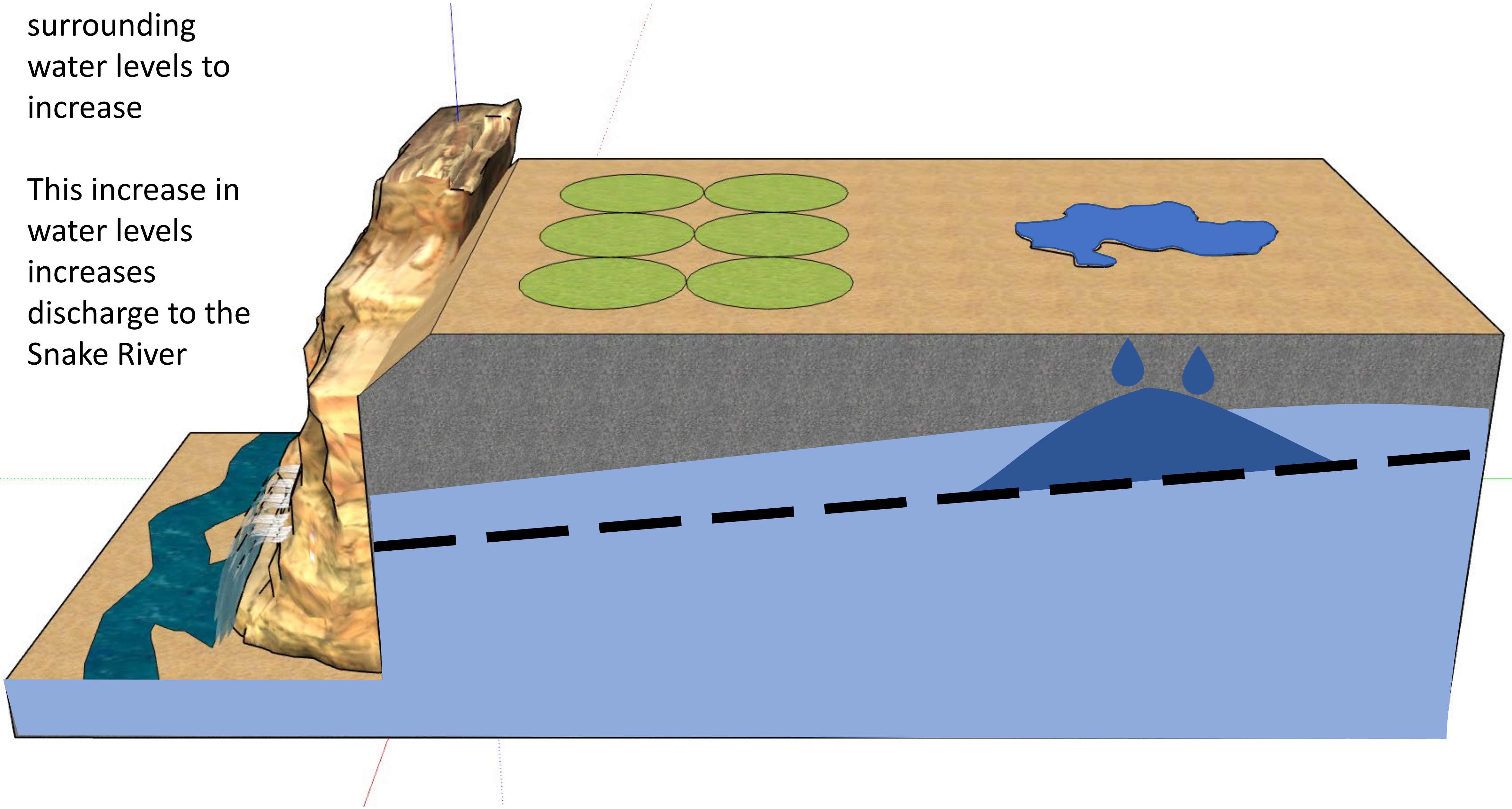


- Recharge adds water to the aquifer
- This water mounds up underneath the recharge site

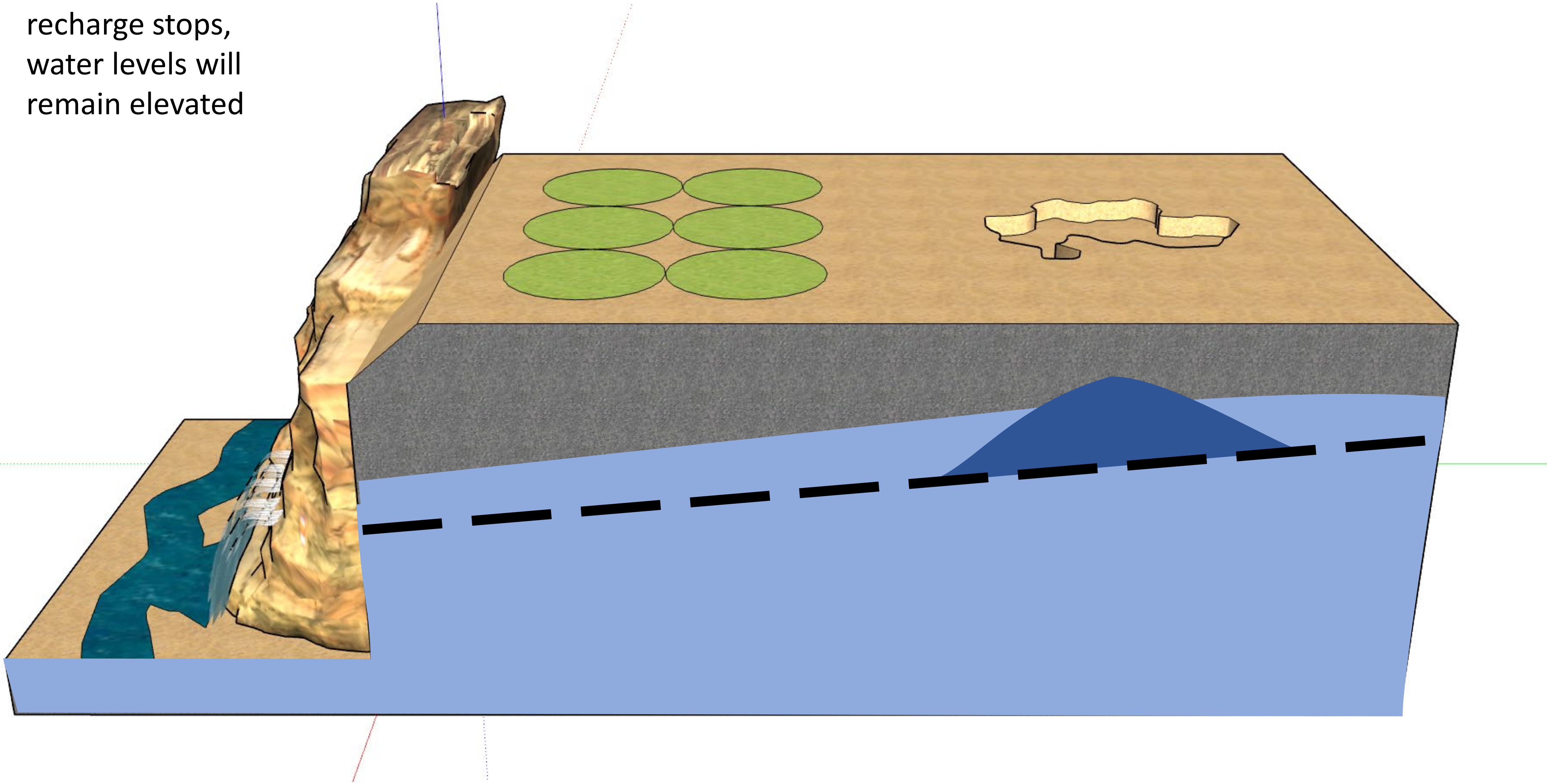


- This water causes surrounding water levels to increase

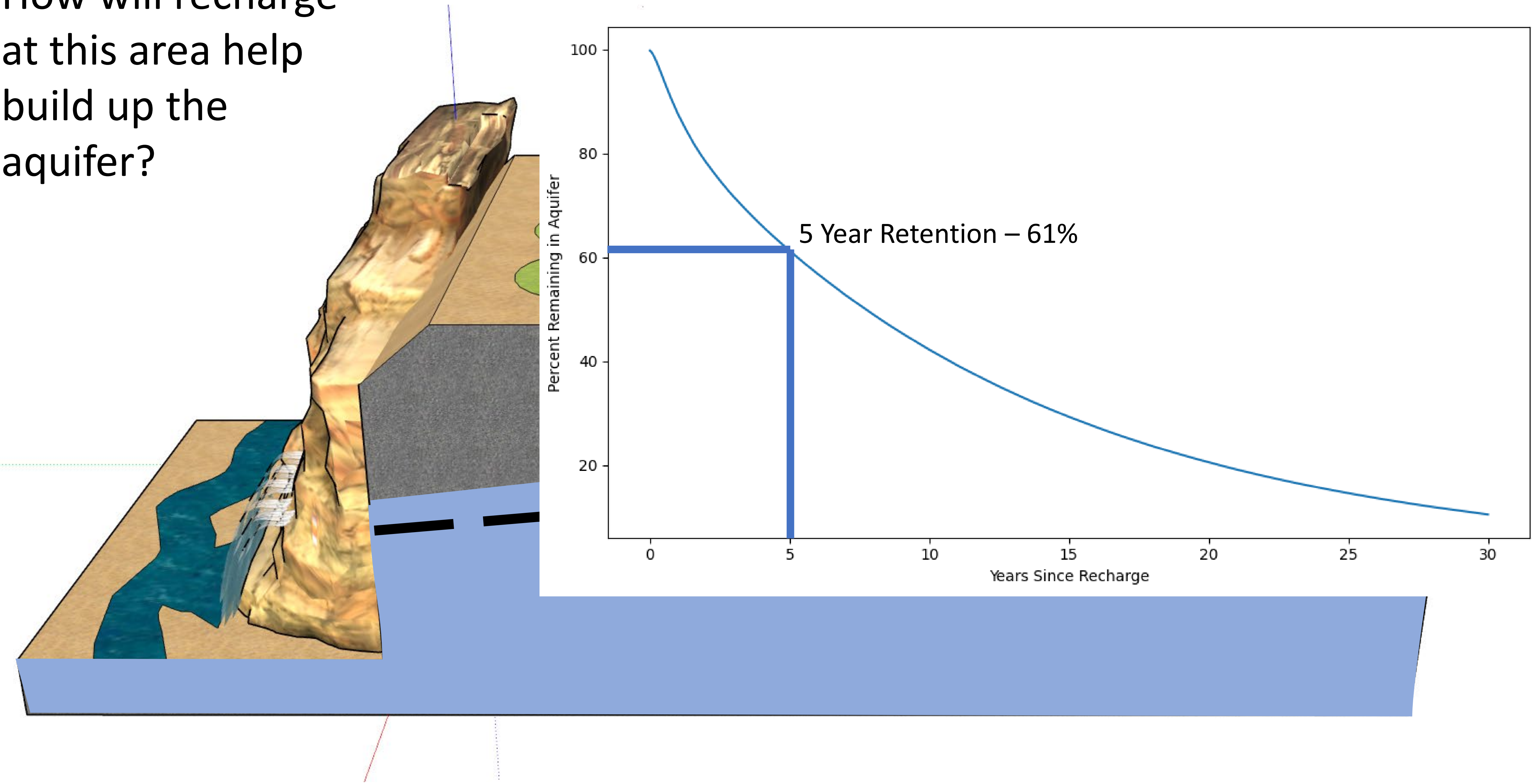
- This increase in water levels increases discharge to the Snake River



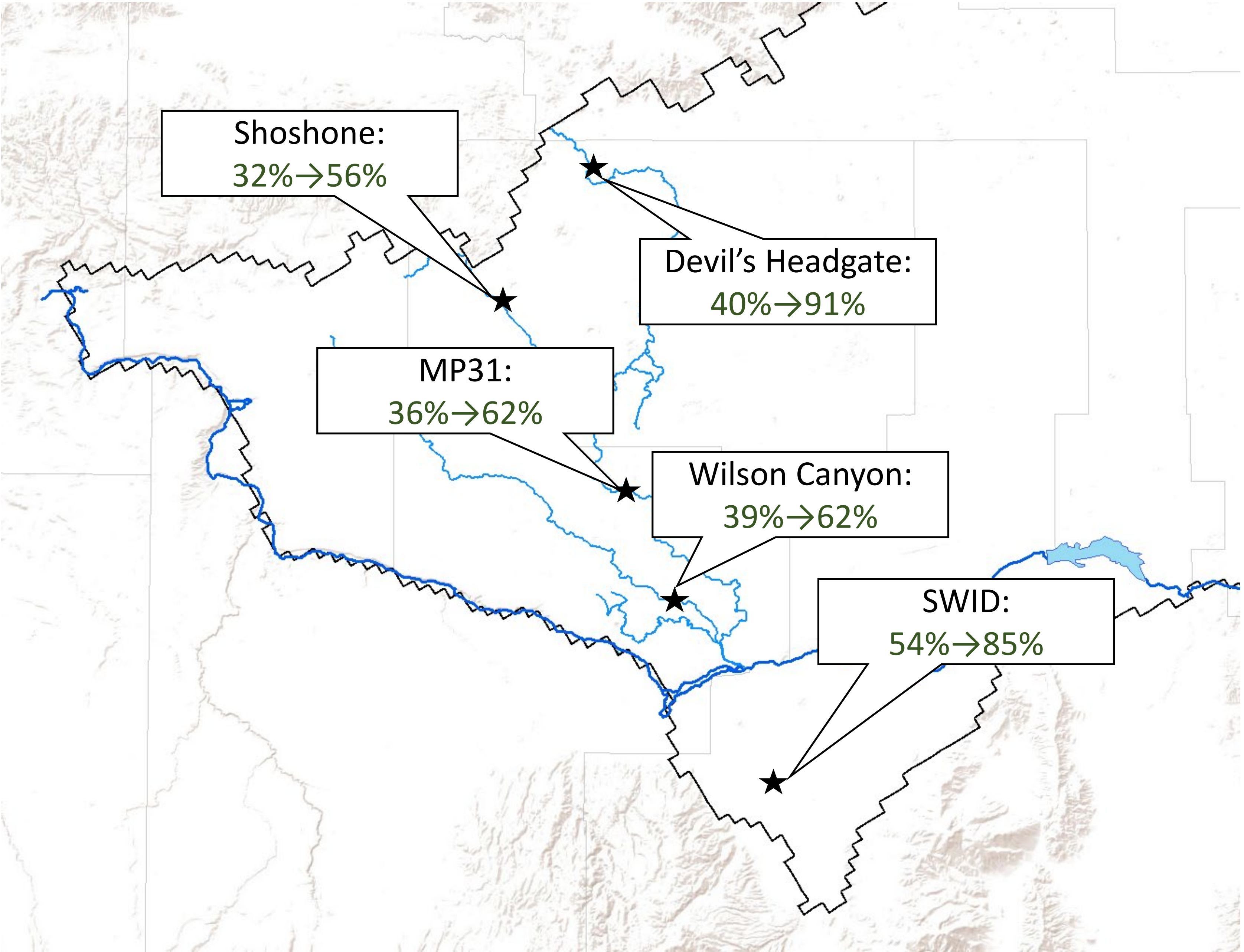
- Even after recharge stops, water levels will remain elevated



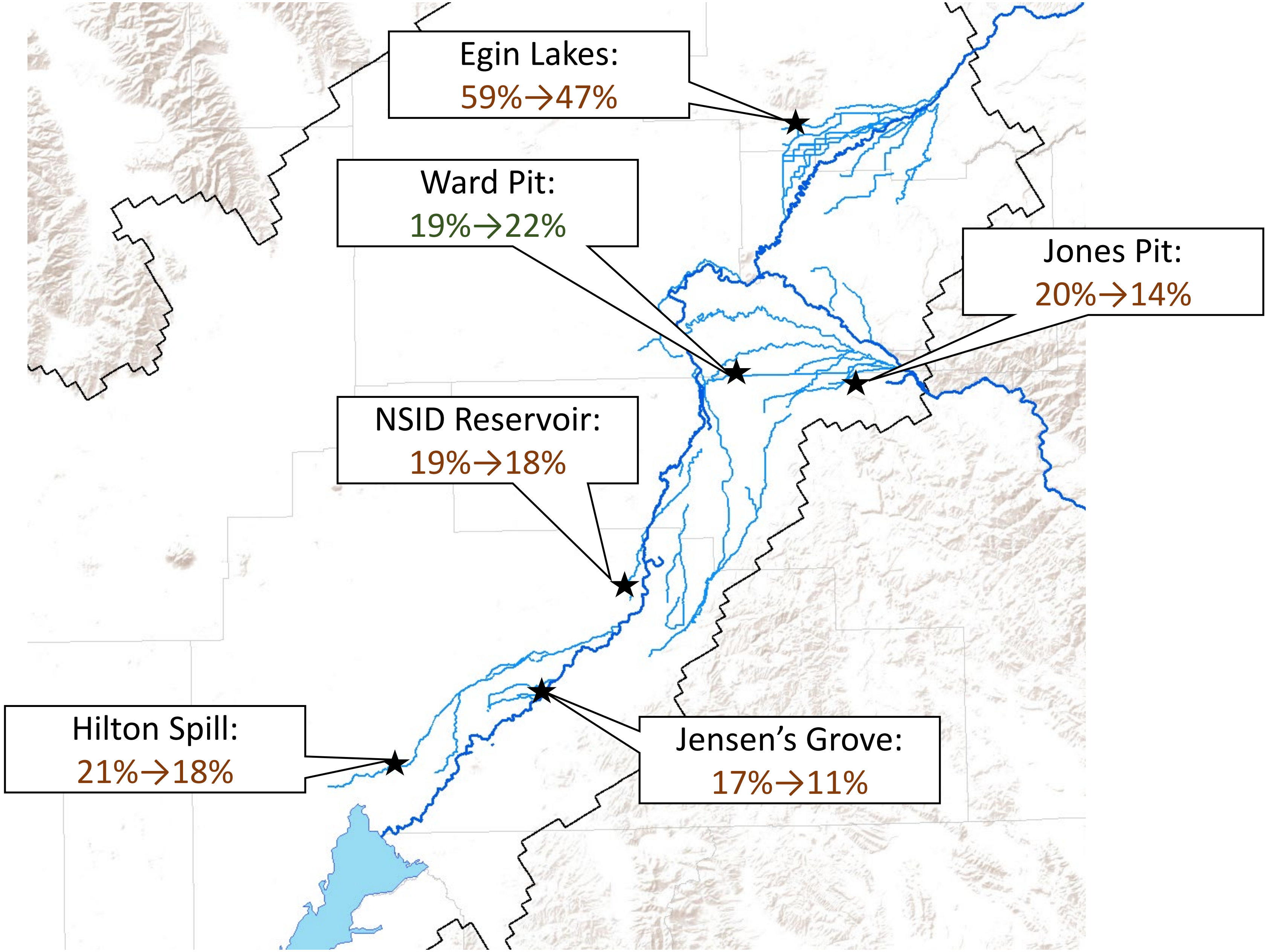
How will recharge at this area help build up the aquifer?



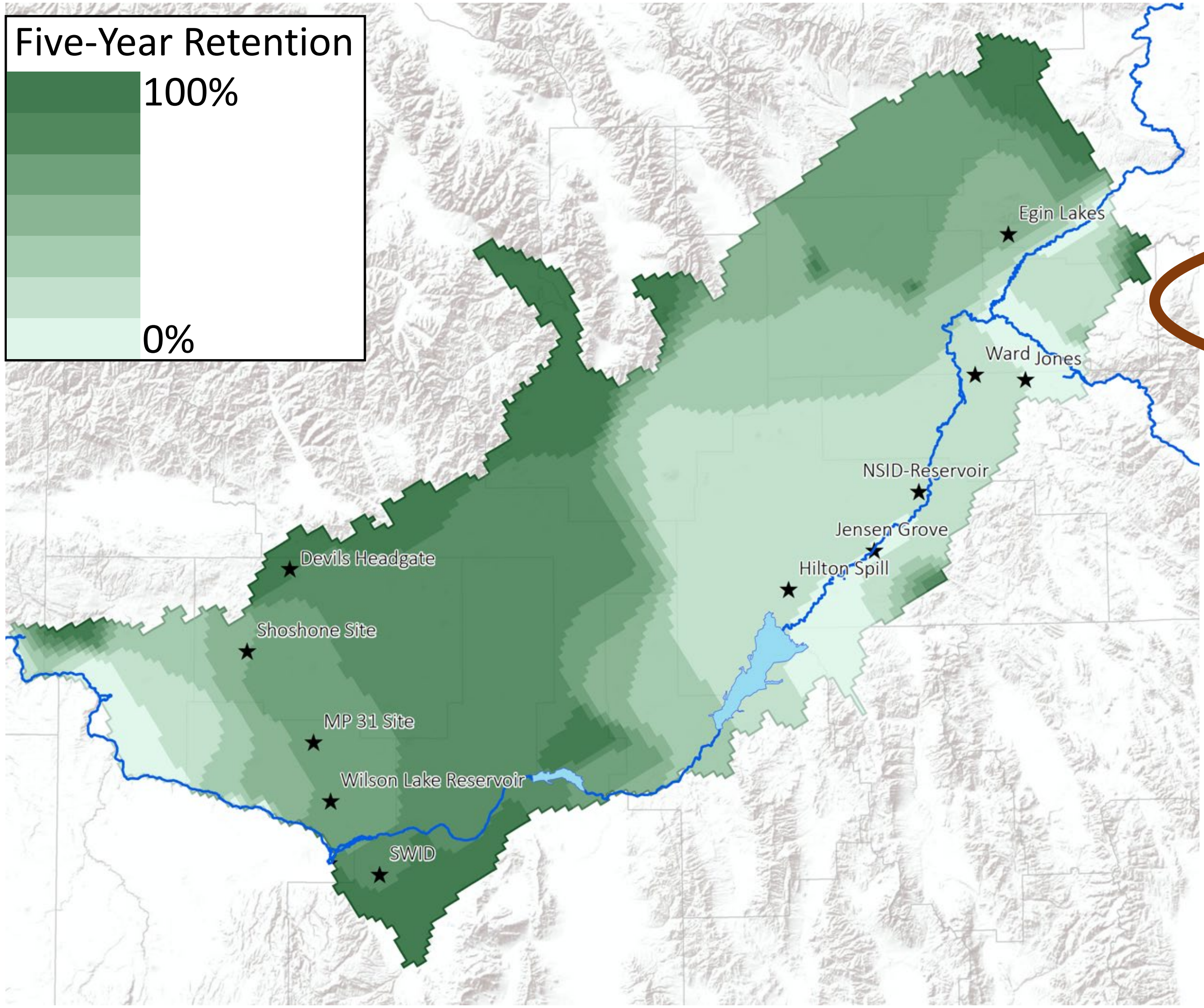
How much has retention changed in the Lower Valley?



How much has retention changed in the Upper Valley?

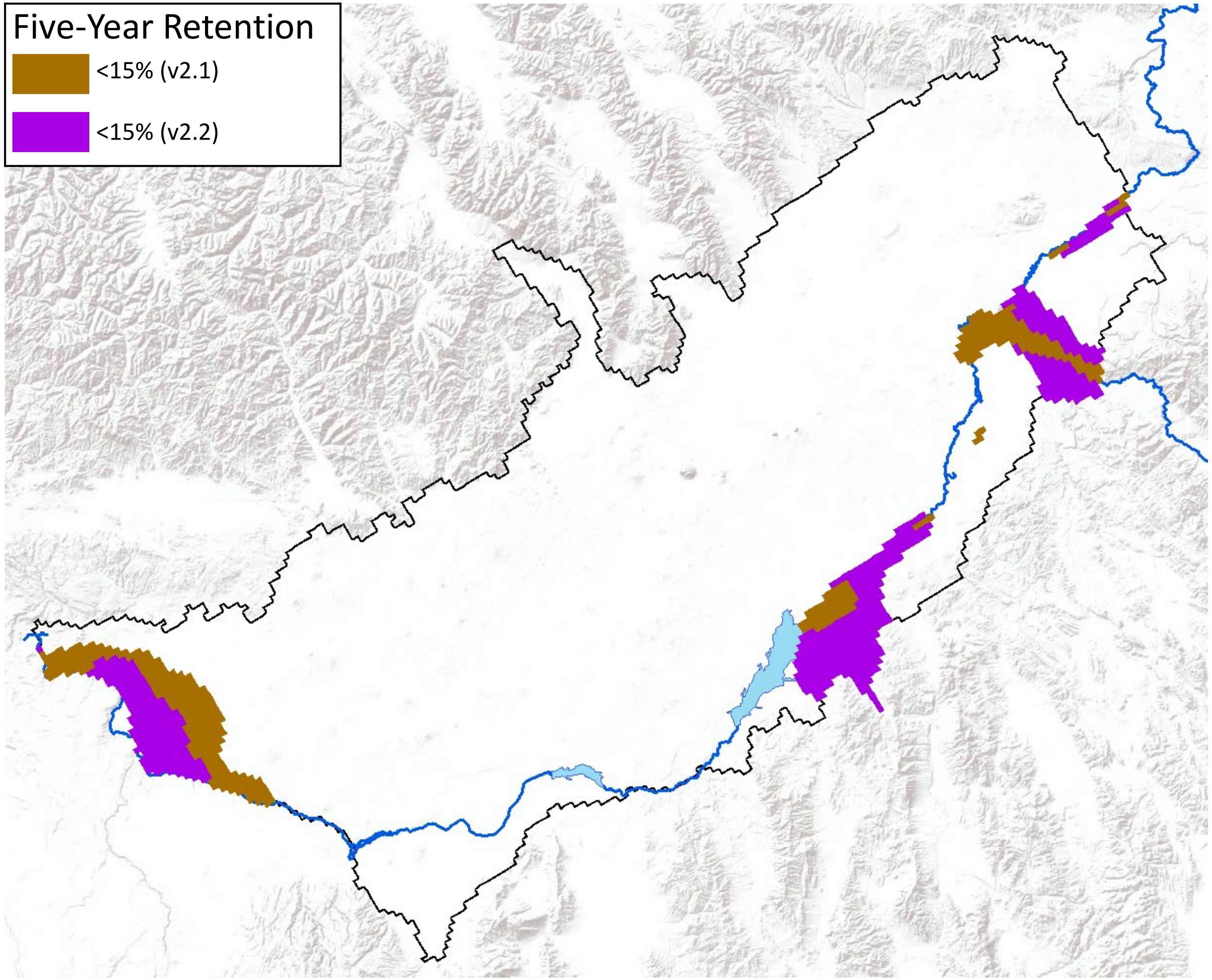


Retention generally decreased in the Upper Valley and increased in the Lower Valley

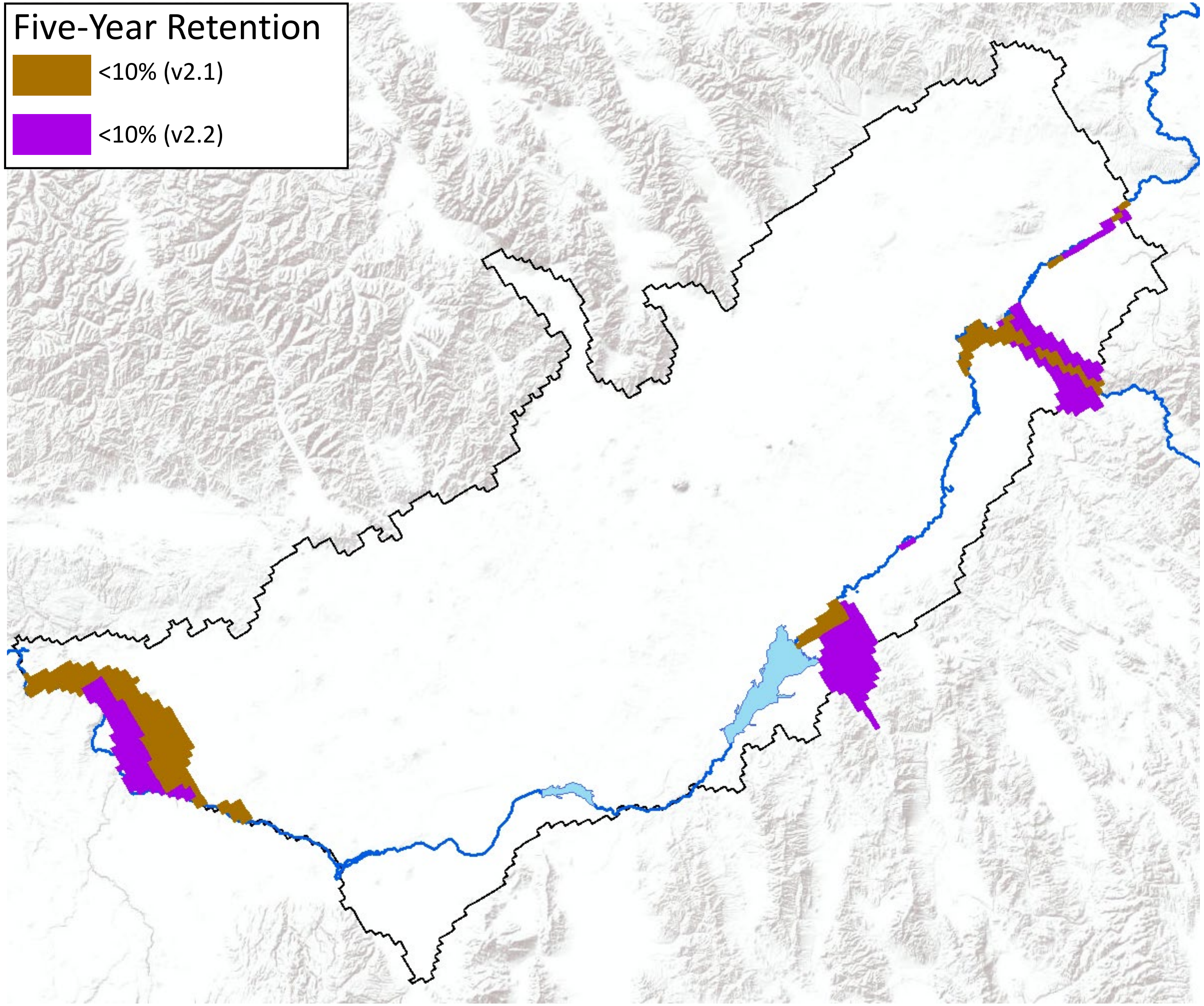


Site	Retention ESPAM v2.1	Retention ESPAM v2.2	Change
Egin Lakes	59%	47%	-12%
Jensen's Grove	17%	11%	-6%
Jones Pit	20%	14%	-6%
Hilton Spill	21%	18%	-3%
NSID Reservoir	19%	18%	-1%
Ward Pit	19%	22%	3%
Wilson Canyon	39%	62%	23%
Shoshone	32%	56%	24%
MP31	36%	62%	26%
SWID	54%	85%	31%
Devil's Headgate	40%	91%	51%

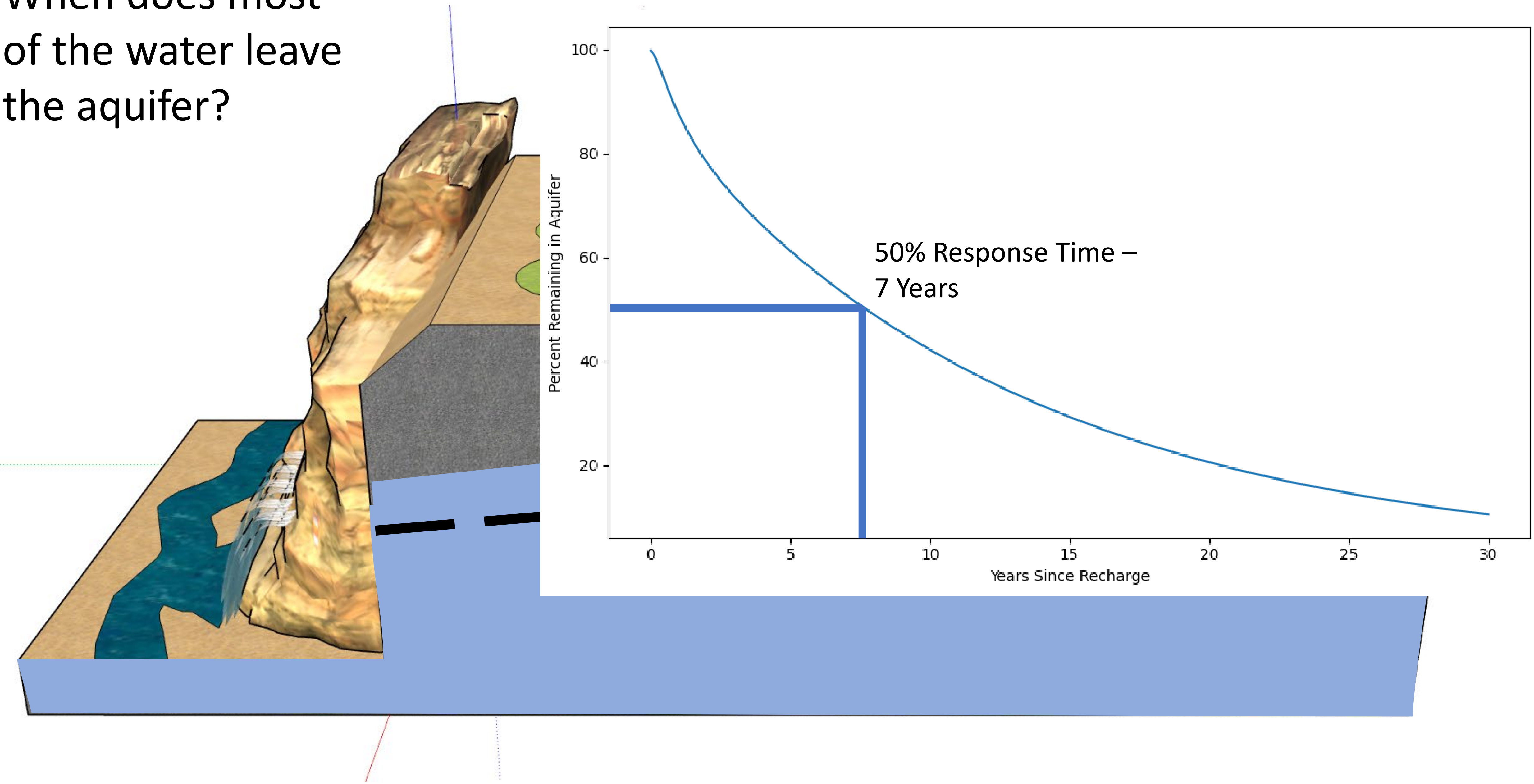
15% Retention Cutoff Comparison



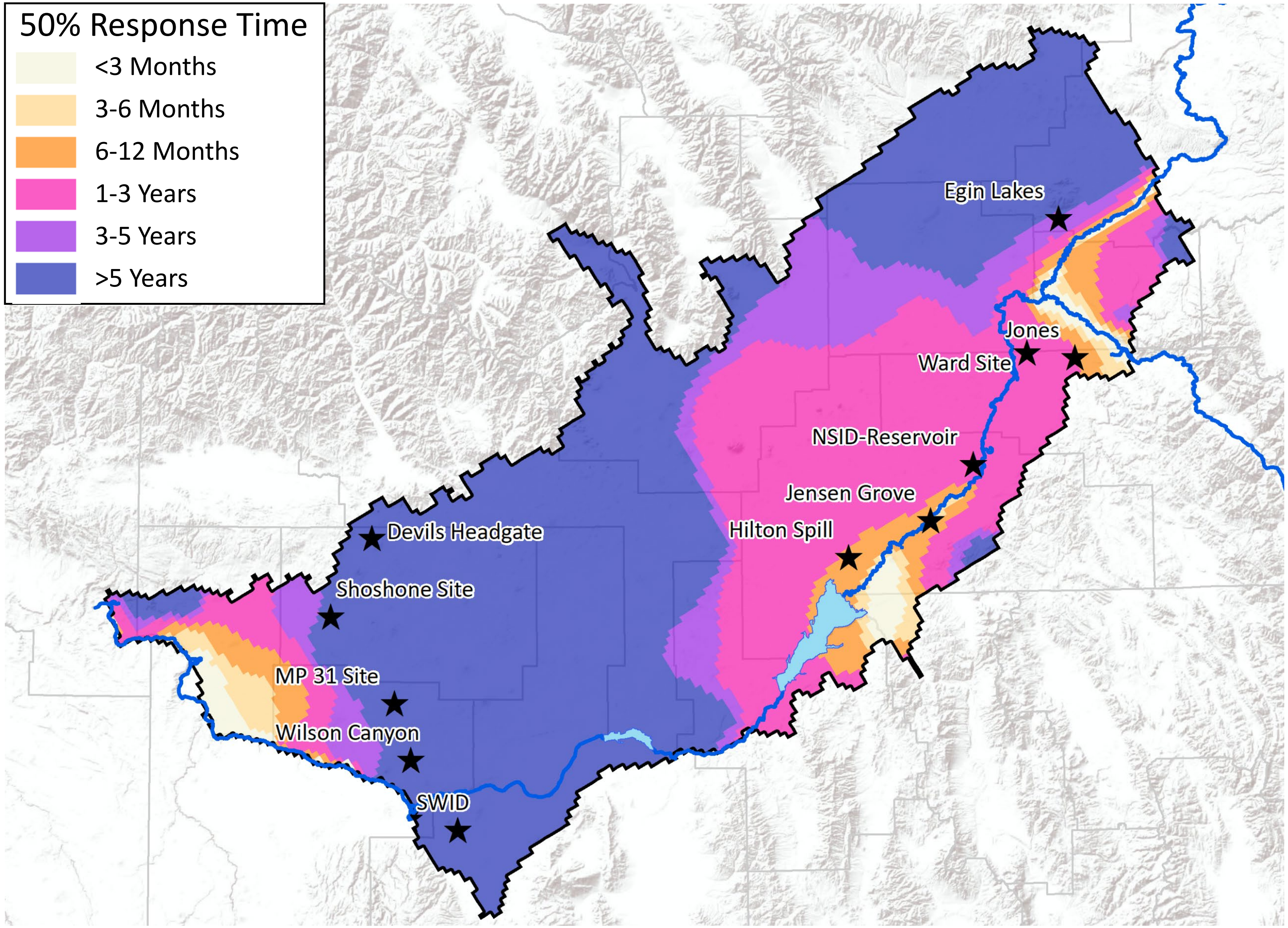
10% Retention Cutoff Comparison



When does most of the water leave the aquifer?



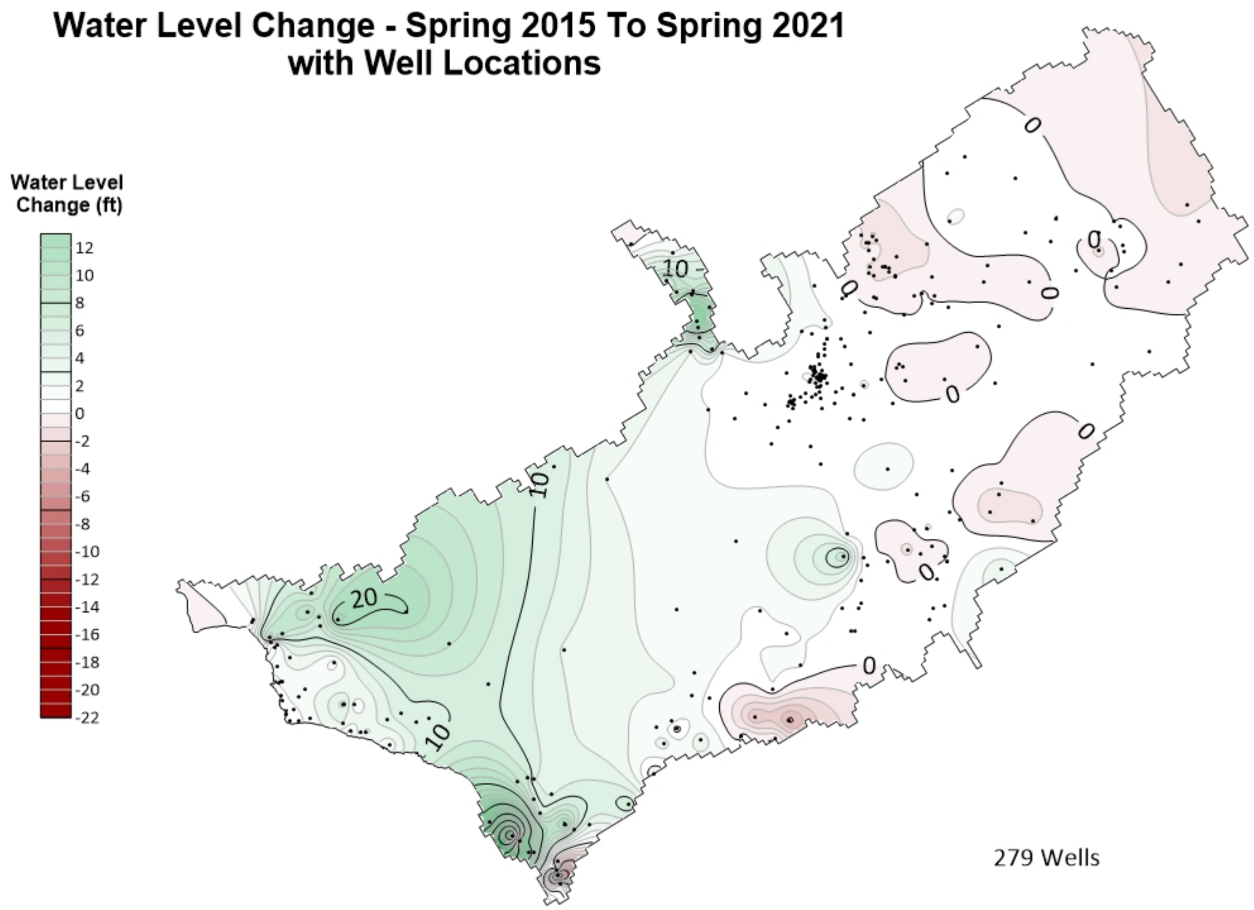
Many low retention areas still have 50% response times greater than one year



Site	50% Response Time
Jensen's Grove	5 m
Hilton Spill	12 m
Jones Pit	13 m
NSID Reservoir	18 m
Ward Pit	2 y
Egin Lakes	4 y
Wilson Canyon	> 5 y
Shoshone	> 5 y
MP31	> 5 y
SWID	> 5 y
Devil's Headgate	> 5 y

Who is benefiting from managed recharge?

- One of the goals of the IWRB is to raise aquifer levels throughout the ESPA
- As aquifer levels raise, spring and reach gains also increase
- Used historical data from 1995-2007 to model benefits of IWRB Recharge



Phase I Analysis

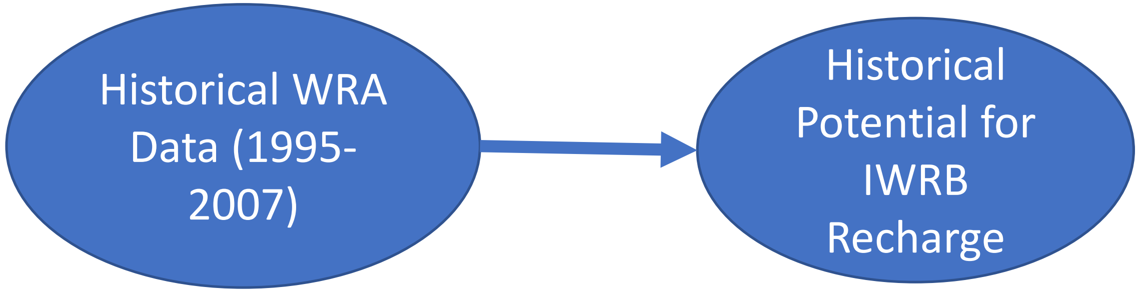
- Identifying these beneficiaries is not a straightforward task
  - These are complex systems with a multitude of interacting elements
  - There are numerous beneficiaries on each system
- Phase I creates a framework to estimate how recharged water benefits water users throughout the ESPA
  - Significant uncertainty due to multitude of assumptions
  - Will be refined in future work

Phase I Recharge Benefits Analysis Summary

Historical WRA Data (1995-2007)

Used historical water rights accounting data to determine when IWBR recharge water right would be in priority

Phase I Recharge Benefits Analysis Summary

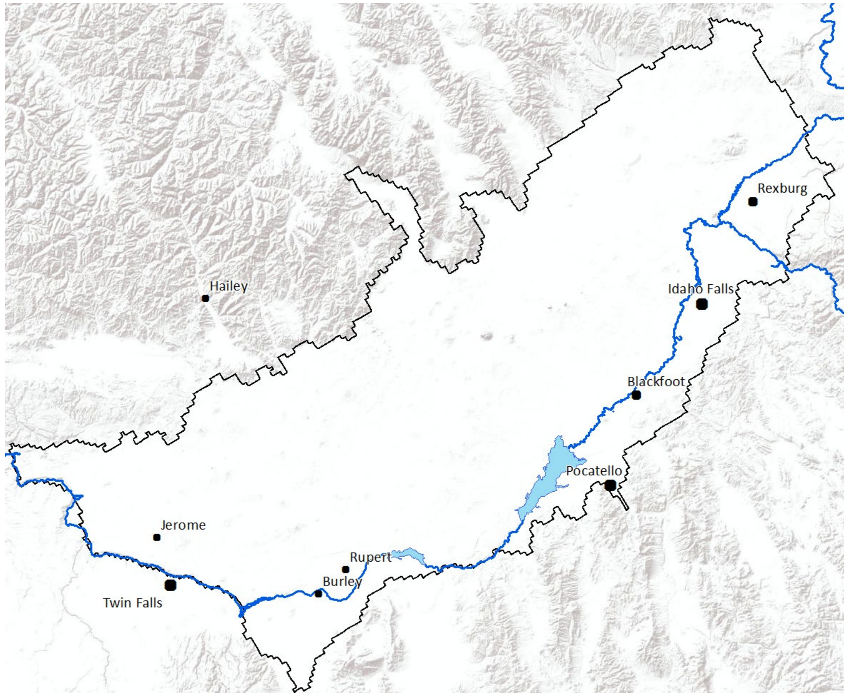


Combined with current (2021) recharge capacity to determine how much recharge could have occurred. An estimated downtime term is used to account for construction, maintenance, weather, etc.

Phase I Recharge Benefits Analysis Summary

Historical WRA Data (1995-2007) → Historical Potential for IWRB Recharge → Ran through ESPAM v2.2

ESPAM v2.2 is used to determine the changes in reach and spring gains because of IWRB recharge



Phase I Recharge Benefits Analysis Summary

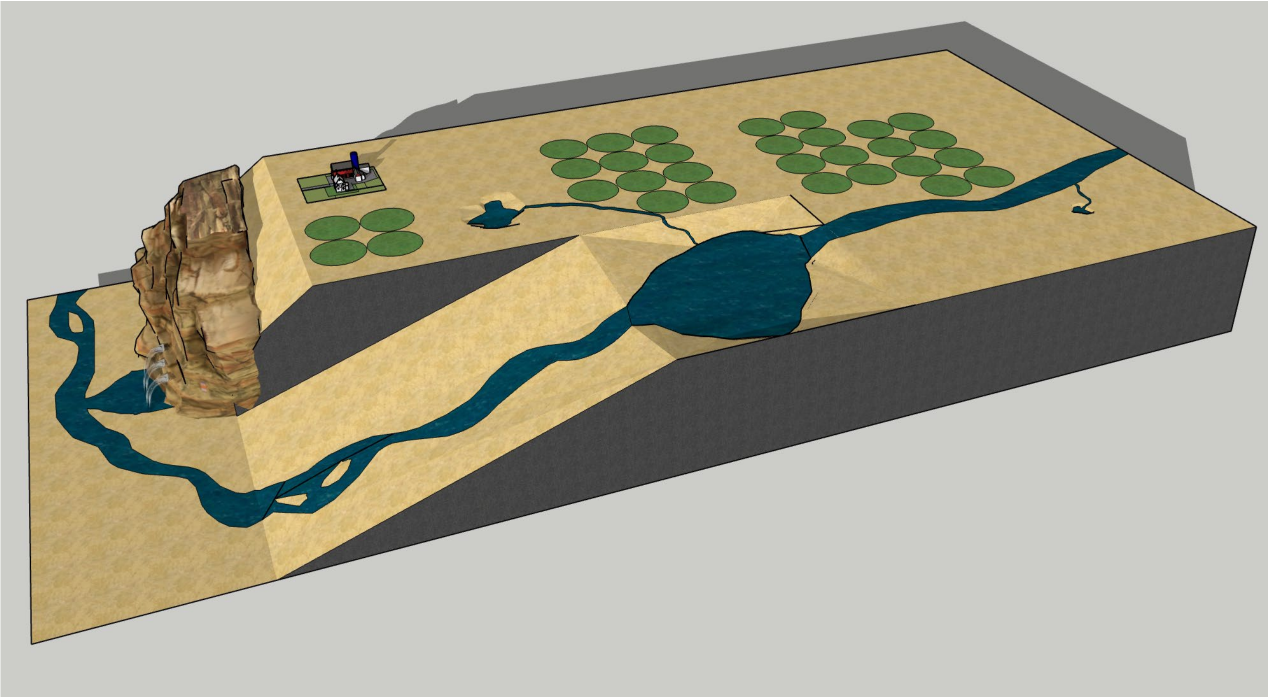
Historical WRA Data (1995-2007)

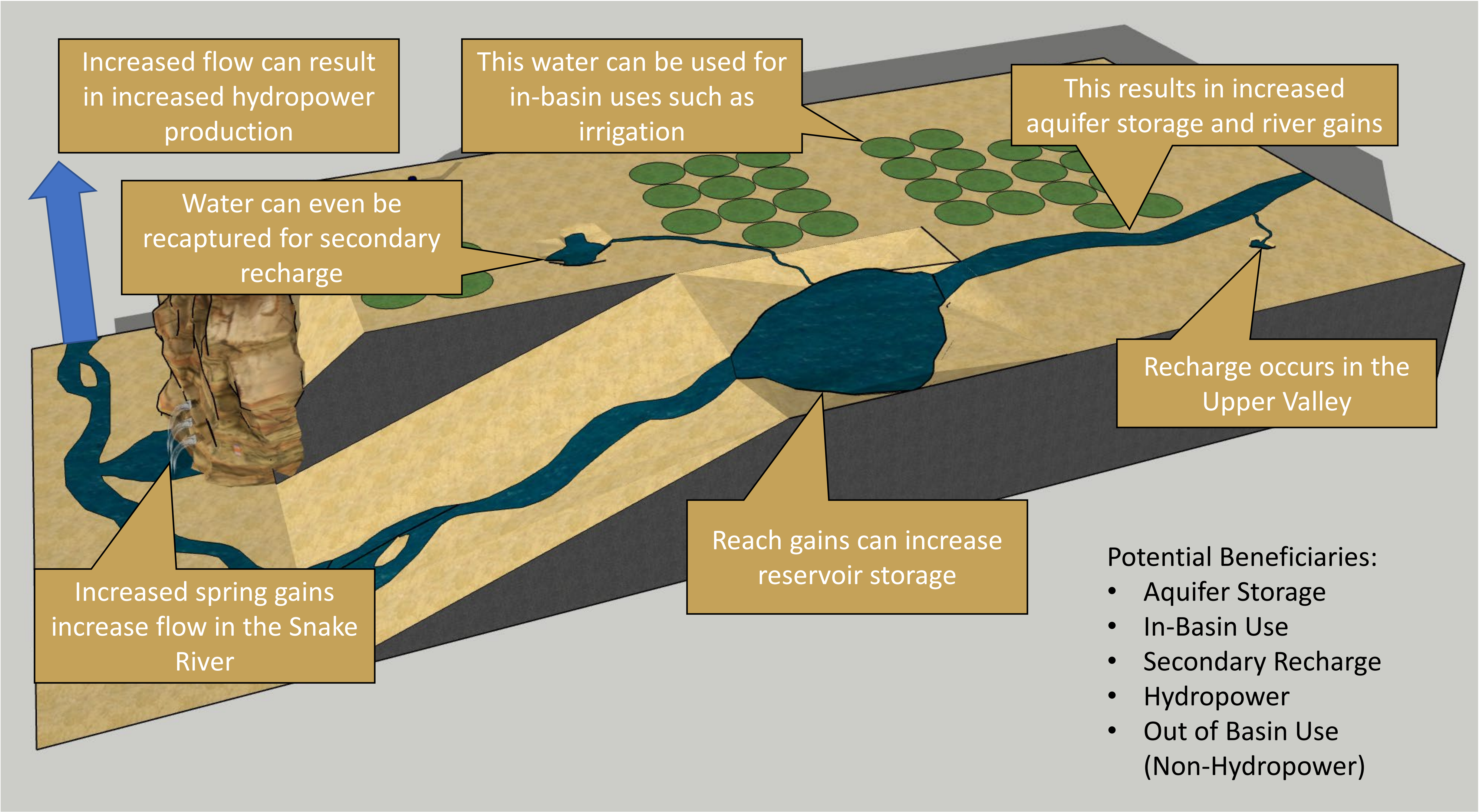
→ Historical Potential for IWRB Recharge

→ Ran through ESPAM v2.2

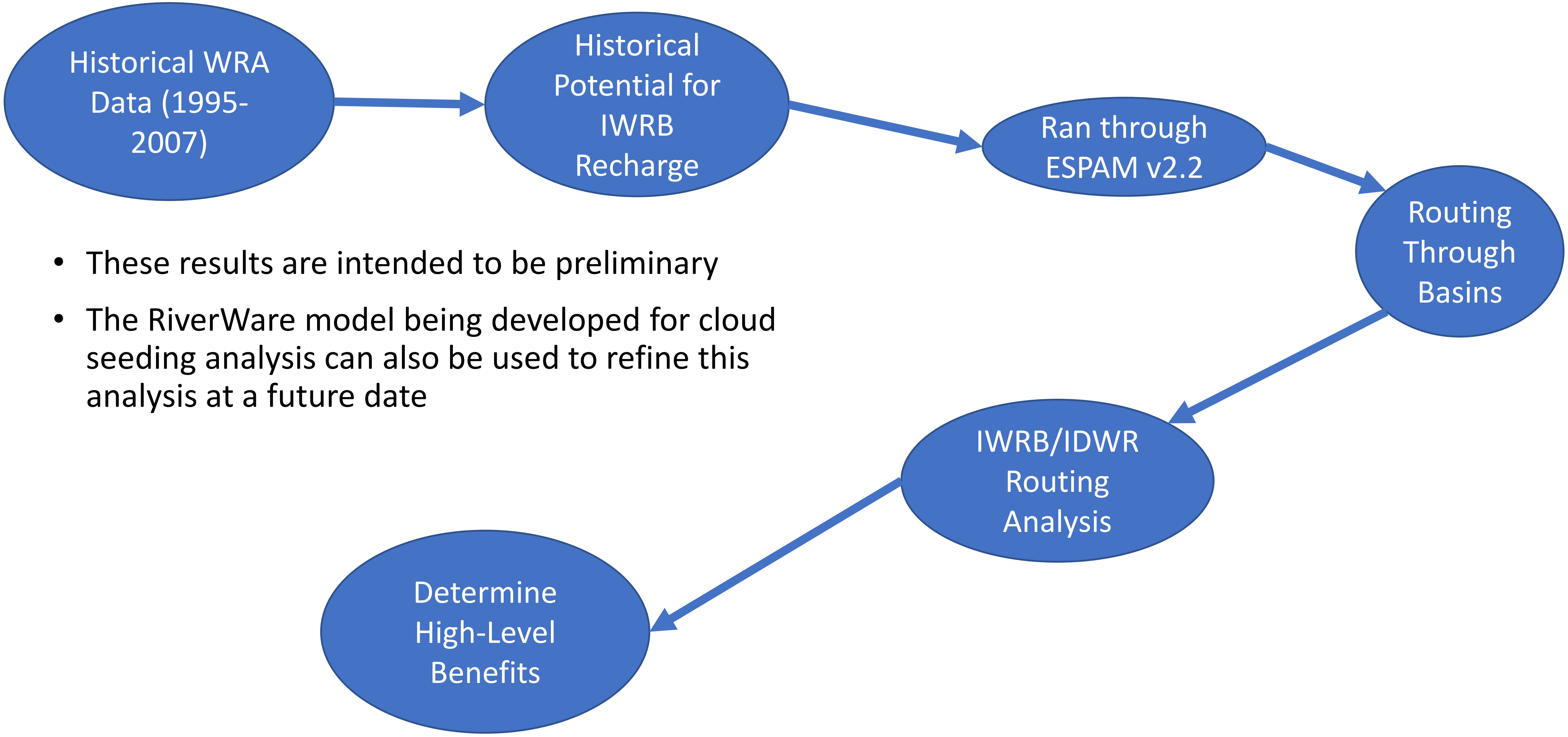
→ Routing Through Basins

→ IWRB/IDWR Routing Analysis



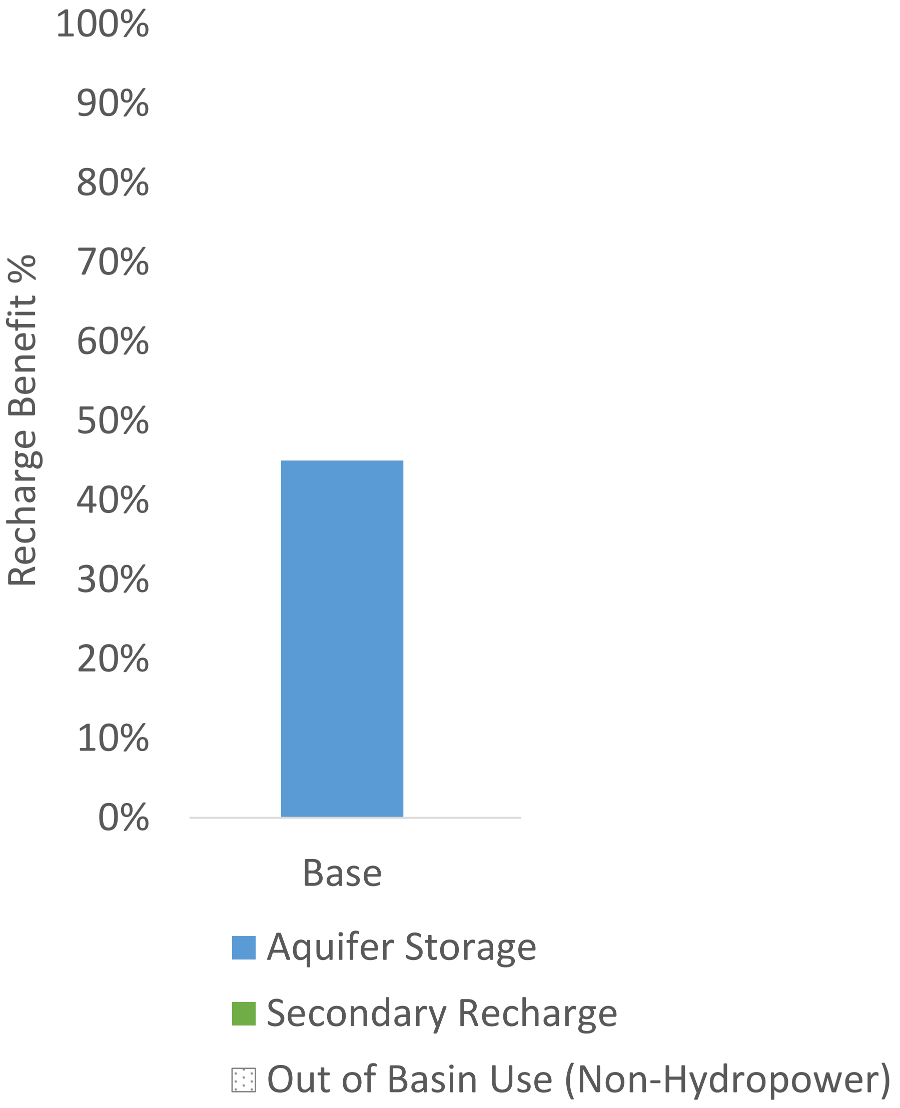

Increased flow can result in increased hydropower production
This water can be used for in-basin uses such as irrigation
This results in increased aquifer storage and river gains
Water can even be recaptured for secondary recharge
Recharge occurs in the Upper Valley
Reach gains can increase reservoir storage
Increased spring gains increase flow in the Snake River
Potential Beneficiaries:
• Aquifer Storage
• In-Basin Use
• Secondary Recharge
• Hydropower
• Out of Basin Use (Non-Hydropower)

Phase I Recharge Benefits Analysis Summary



- These results are intended to be preliminary
- The RiverWare model being developed for cloud seeding analysis can also be used to refine this analysis at a future date

Potential Benefits of IWRB Recharge (1995-2007)



Phase I High-Level Analysis Takeaways:

- Less than 20% of the total recharge has gone to out of state flow
- Large amount of recharge stay in the aquifer
- Depending where recharge occurs, the benefits can be varied

Conclusions

- There are many ways to look at the benefits of managed recharge

- Each of these metrics answers a different question:
  - Five-Year Retention – How will recharge at this area help rebuild the aquifer?
  - 50% Response Time – When does most of the water leave the aquifer?
  - Benefits Analysis – When recharge leaves the aquifer, who benefits?

- A combination of metrics is most useful for evaluating the effectiveness of recharge at a given location

Questions?

Upper Valley ESPA Recharge Project Investigation

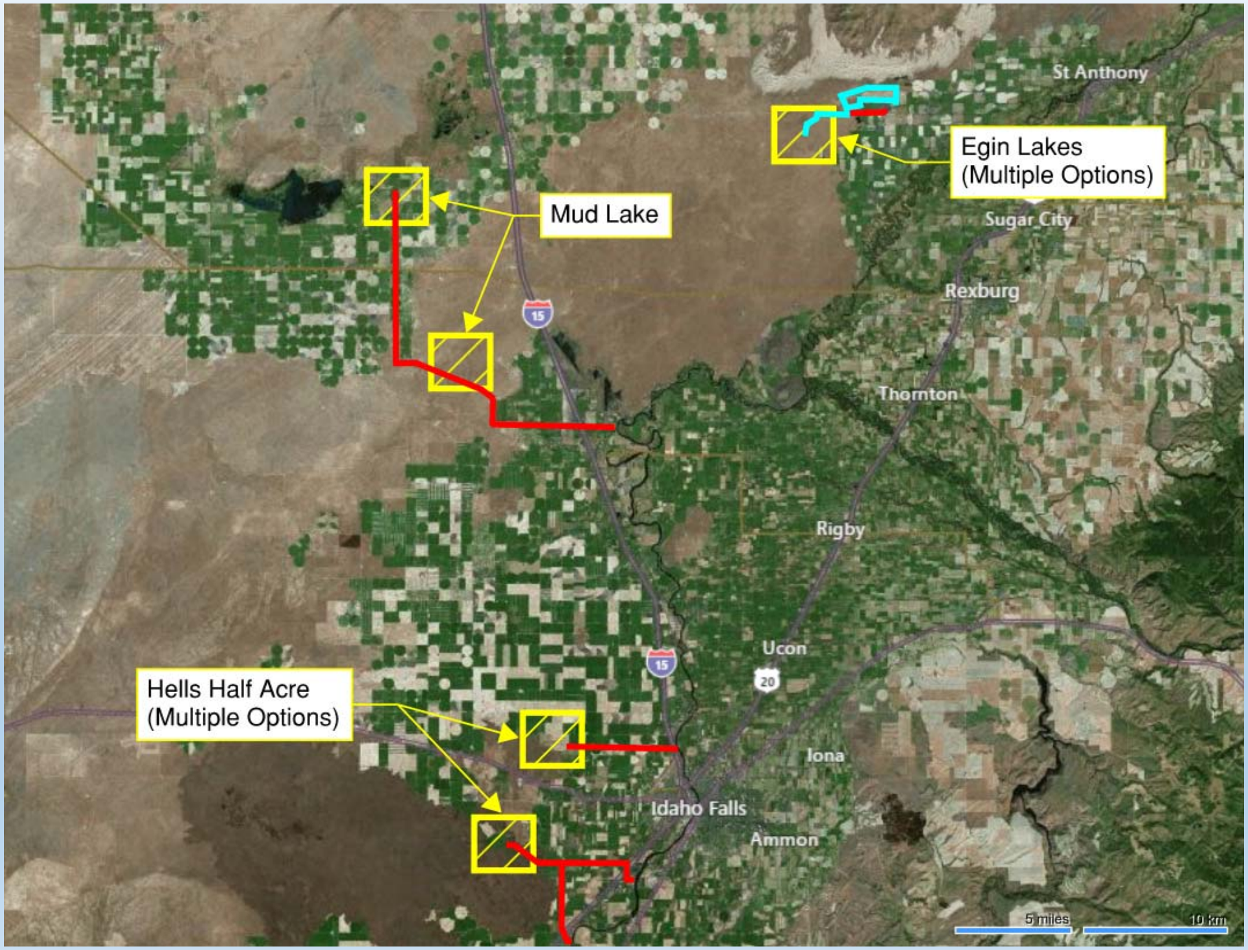
Quadrant Consulting, Inc.

Idaho Water Resource Board

August 27, 2021

Recharge Project Sites

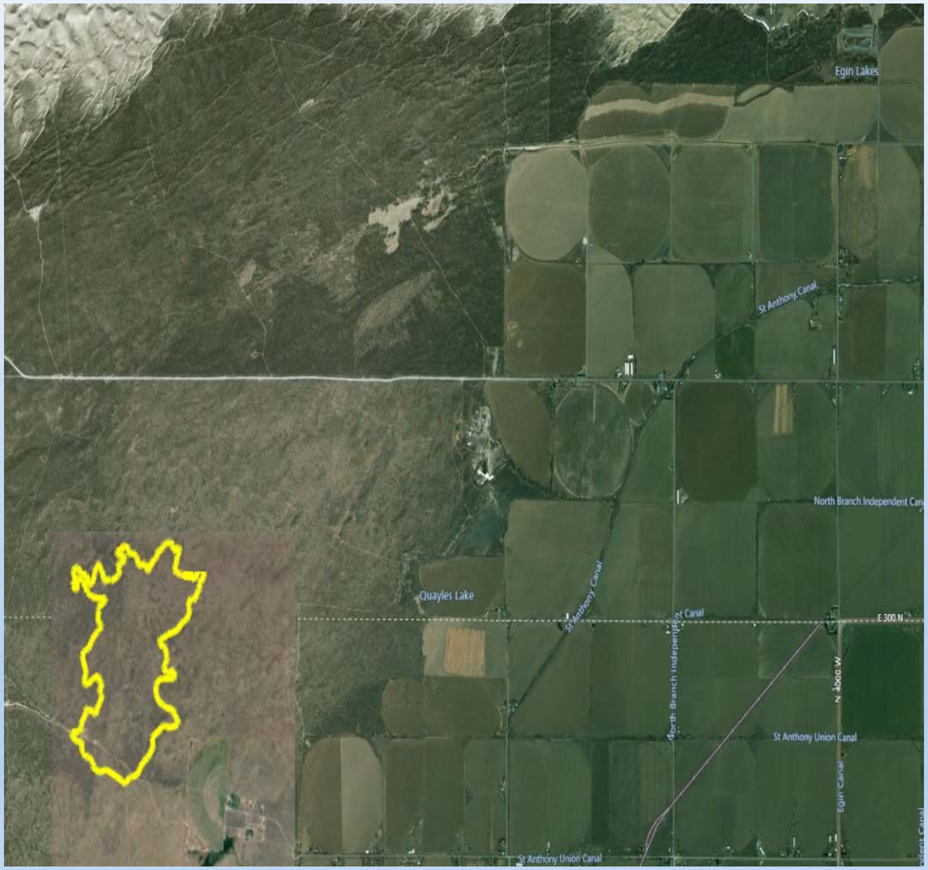
Quadrant Consulting, Inc.



Quadrant Consulting, Inc.

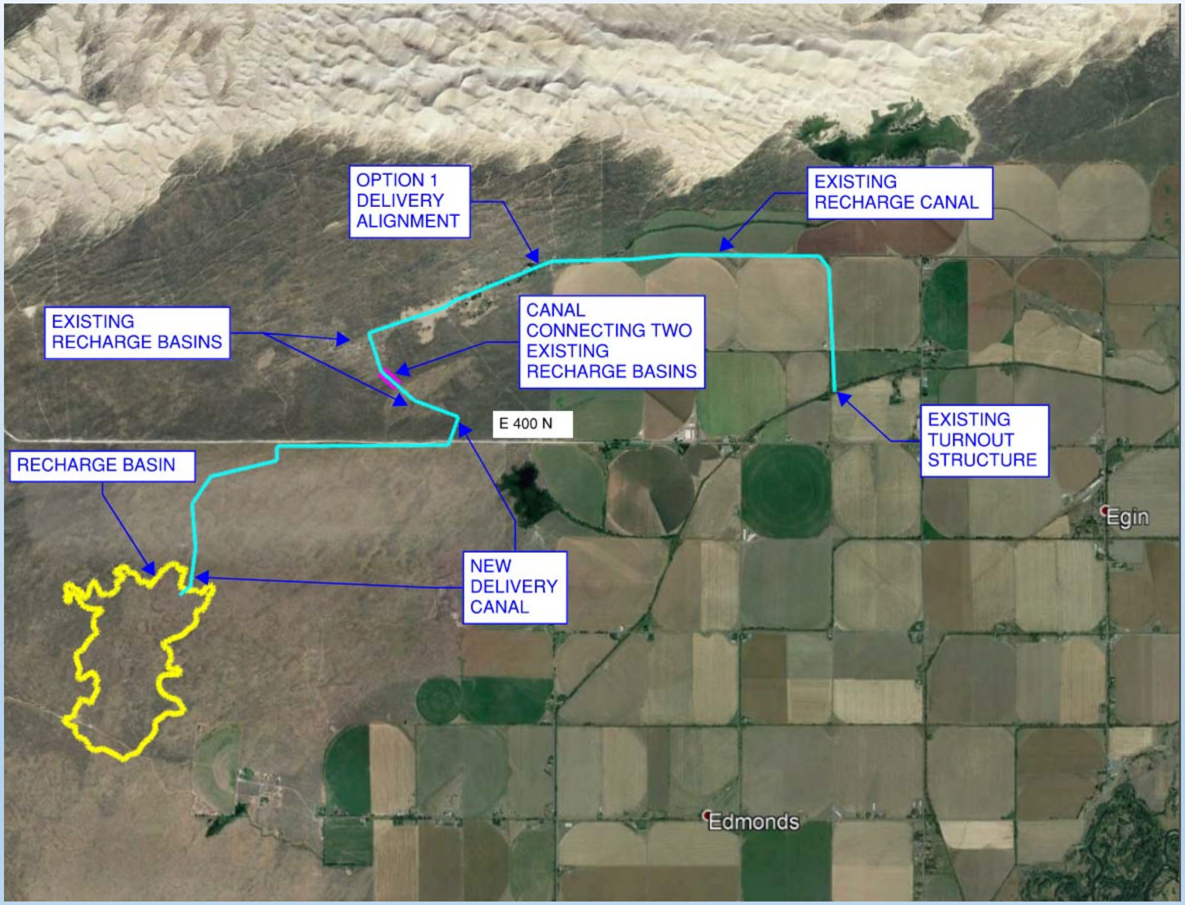
Egin Lakes - Project Summary

- Design Flow: 200 CFS
- Basin Size: 291 +/- Acres
- Expected Recharge: 1/3 – 1/2 (Acre*Feet/Acre/Day)
- Delivery Alignment Option 1: 31,000 LF
- Delivery Alignment Option 2: 20,000 LF
- Delivery Alignment Option 3: 21,000 LF



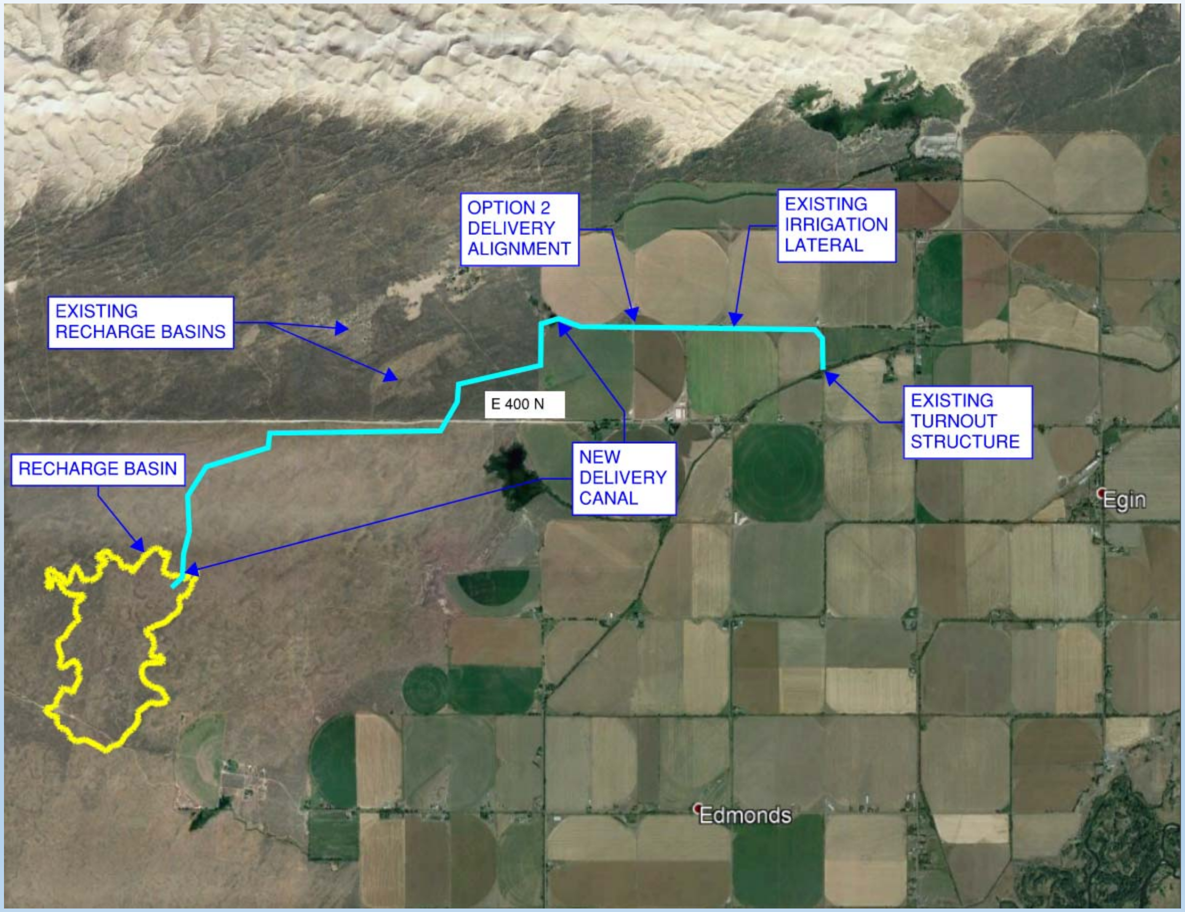
Egin Lakes Recharge Basin

Egin Lakes – Option 1 Delivery Alignment



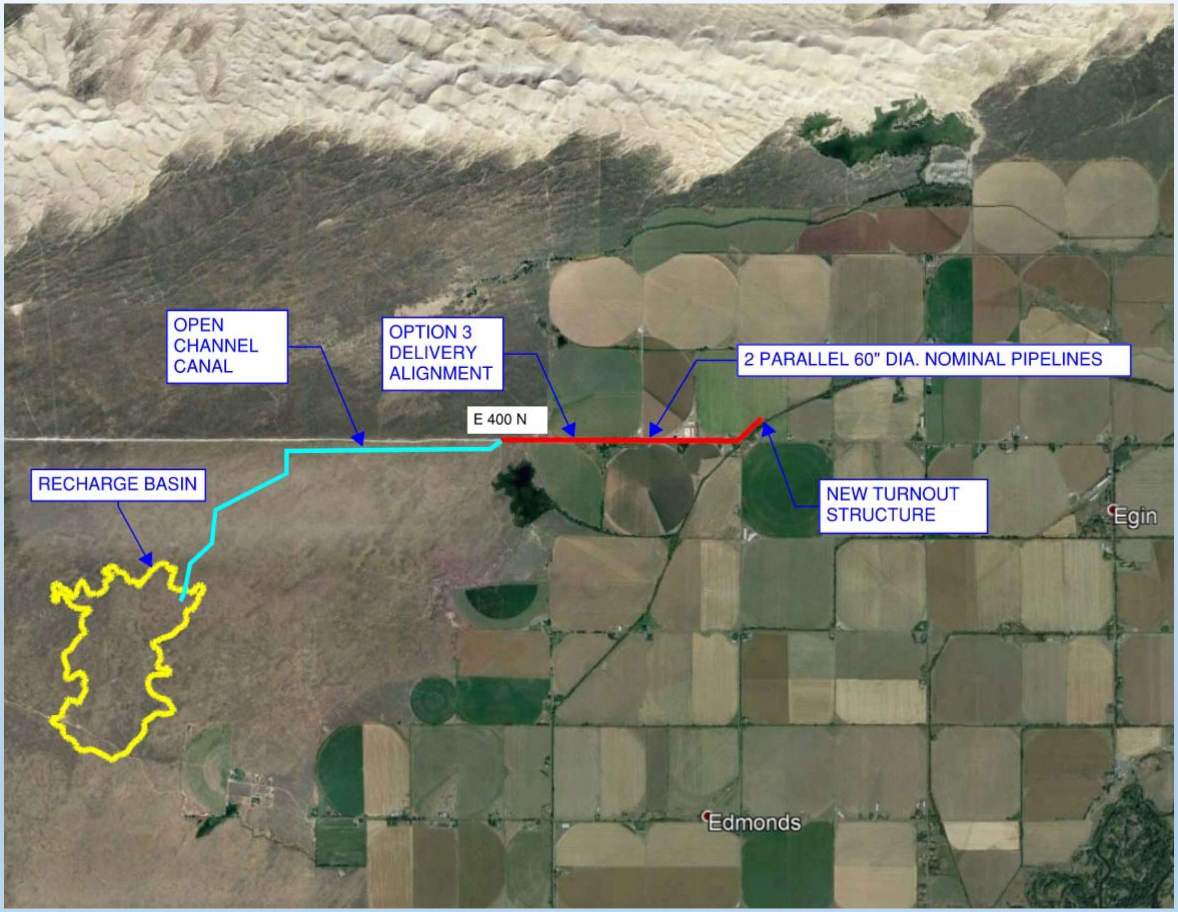
- Increase capacity of existing recharge canal 150 CFS to 350 CFS
- 11,000 LF of new canal construction
- 31,000 CY rock excavation ≈$2,325,000

Egin Lakes – Option 2 Delivery Alignment



- Increase capacity of existing irrigation lateral
- 13,000 LF new canal construction
- 45,000 CY rock excavation ≈$3,375,000

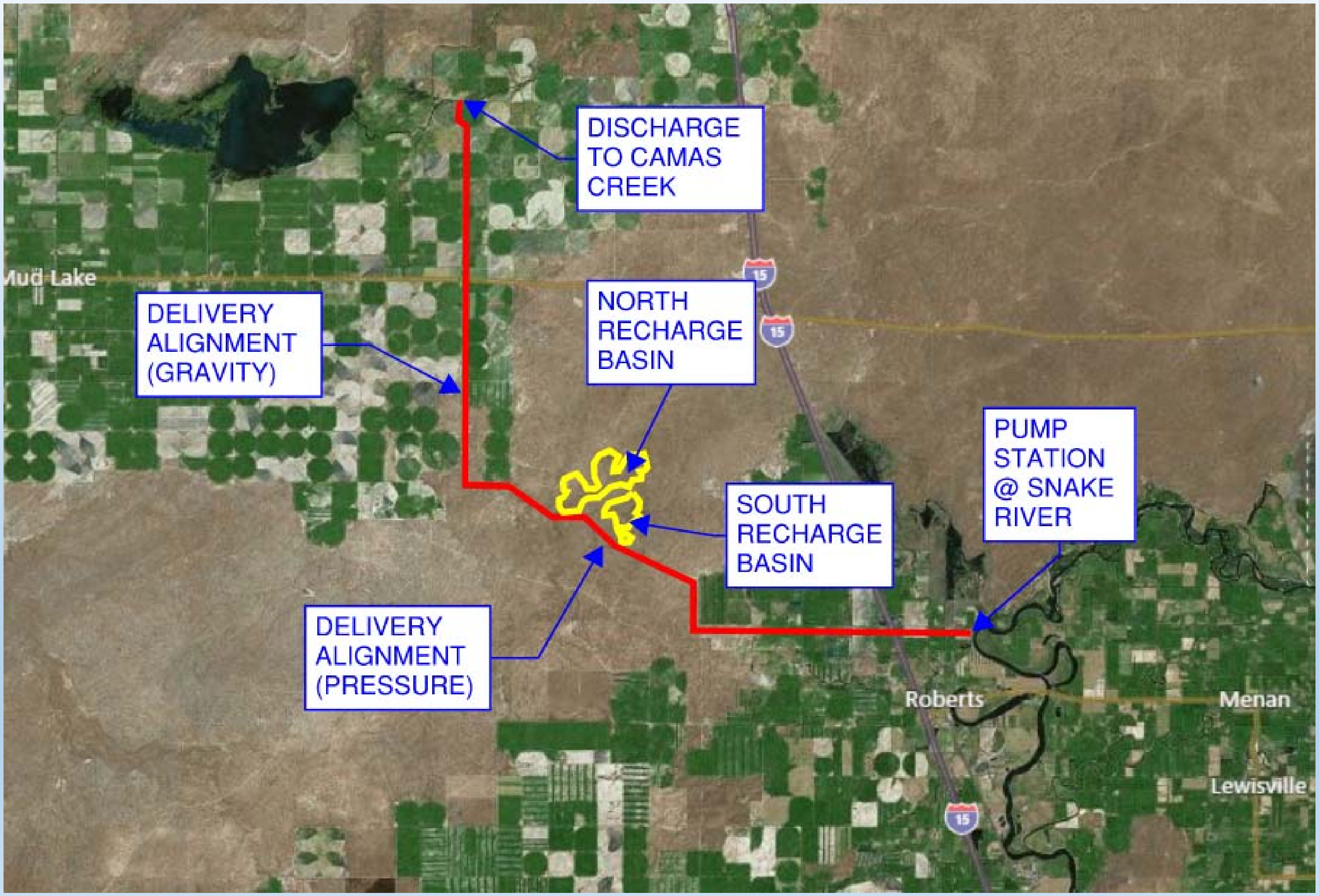
Egin Lakes – Option 3 Delivery Alignment



- 15,600 LF 60” Dia. Nominal Pipe ≈$7,800,000
- 12,200 LF new canal construction
- 39,000 CY rock excavation ≈$2,925,000

Mud Lake - Project Overview

Quadrant Consulting, Inc.

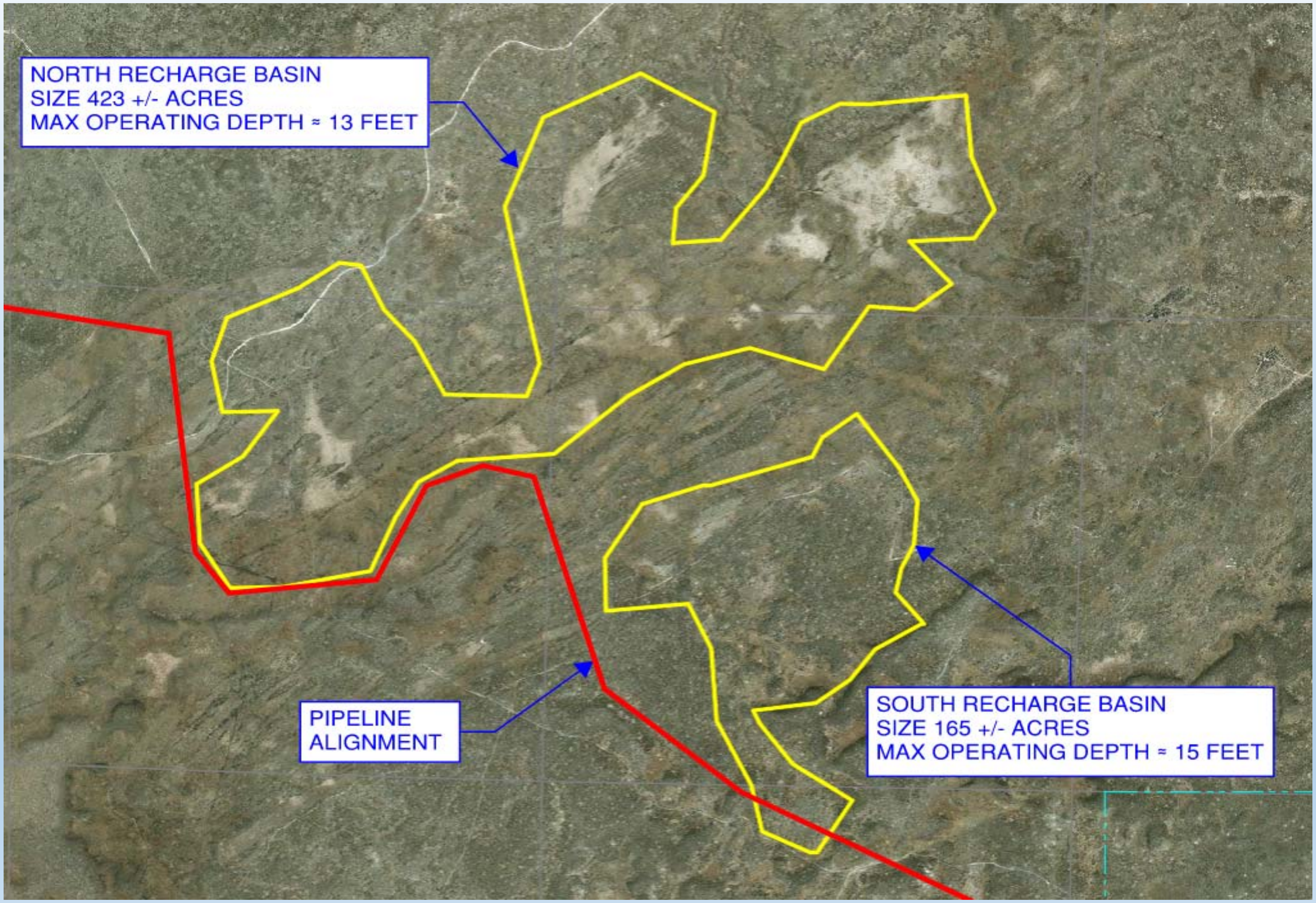


Mud Lake - Project Summary

- Design Flow: 500 CFS
- Combined Basin Size: 588 +/- Acres
- Max. Elevation Change: 60+/- Vertical Feet
- Project Length:
  - Snake River to Recharge Basins - 50,000 LF
  - Recharge Basin to Camas Creek - 50,000 LF
- 4 parallel 72” Dia. Nominal Pipelines
- Pipeline procurement cost ≈$178,500,000

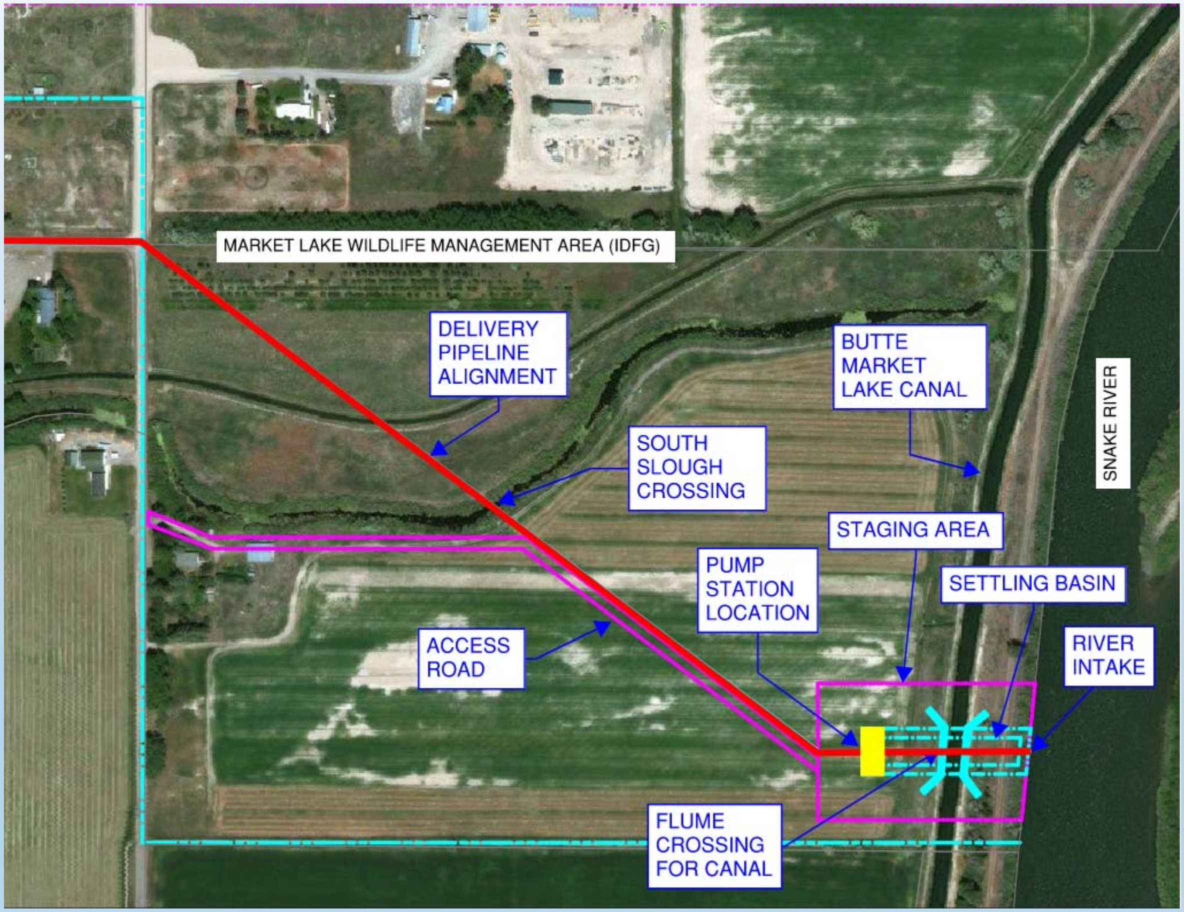
Mud Lake South Recharge Basin

Mud Lake - Recharge Basin Overview



Quadrant Consulting, Inc.

Mud Lake - Pump Site

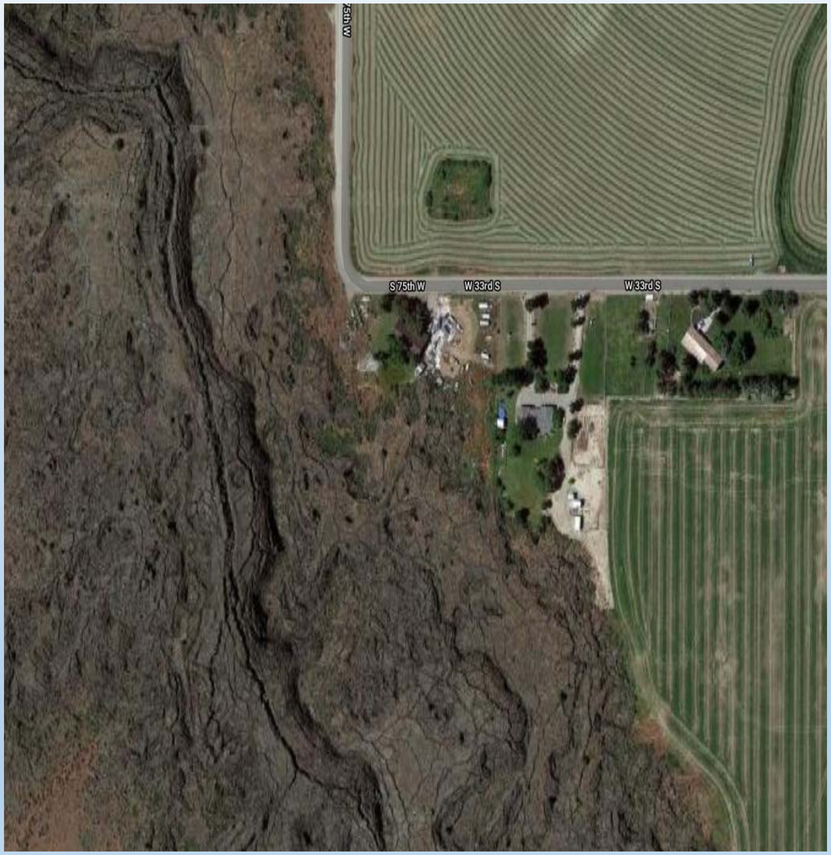


Pump Station Summary

- 4 pumps @ 100 CFS each
- 2 pumps @ 50 CFS each
- Total maximum power demand = 9,800 HP
- Variable Frequency Drive (VFD) control for single 50 CFS pump

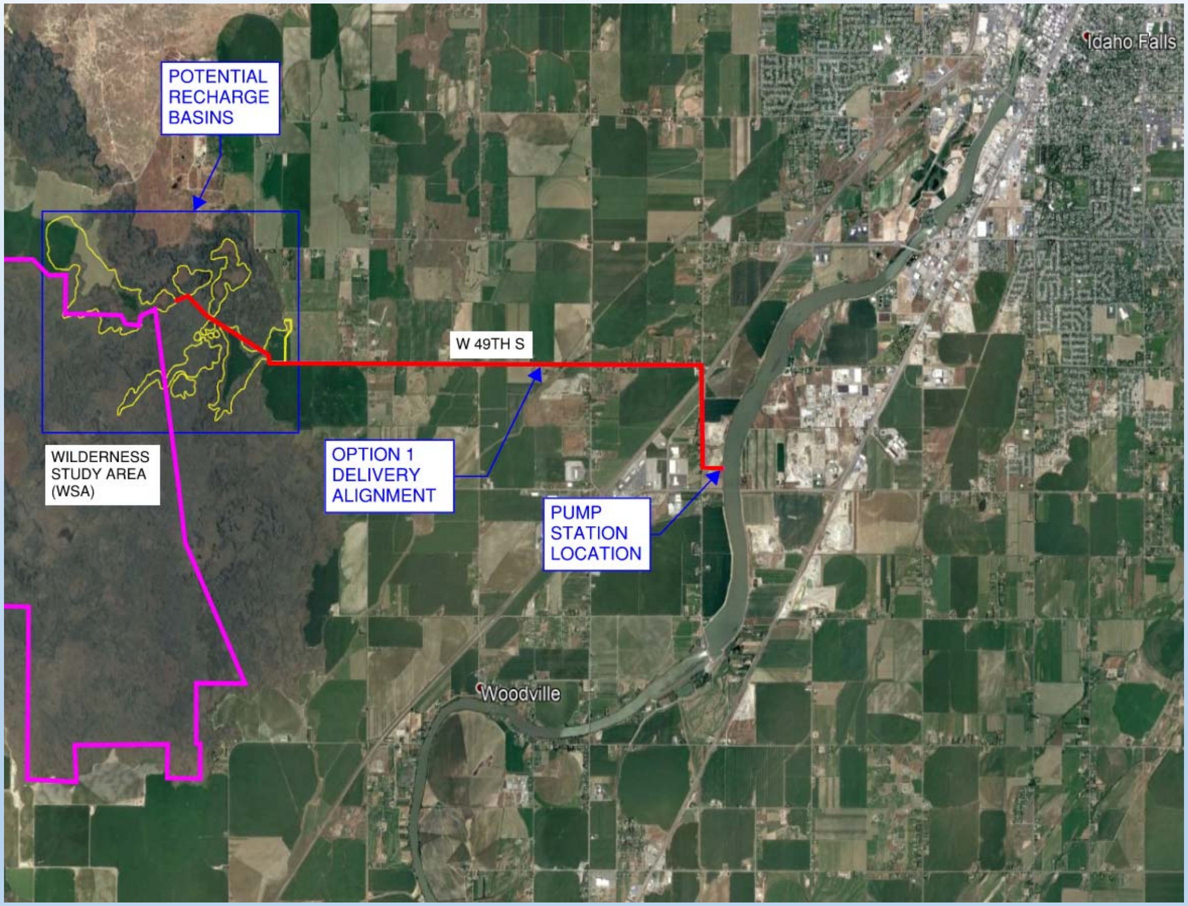
Hells Half Acre - Project Summary

- Design Flow: 200 CFS
- Basin Size (Multiple Options):
  - 582 +/- Acres Maximum (Options 1 & 3)
  - 550 +/- Acres Maximum (Option 2)
- Max. Elevation Change: 30-120 +/- Vertical Feet (Option Dependent)
- Project Length: 24,000 – 35,000 LF (Option Dependent)



Hells Half Acre Fractured Basalt

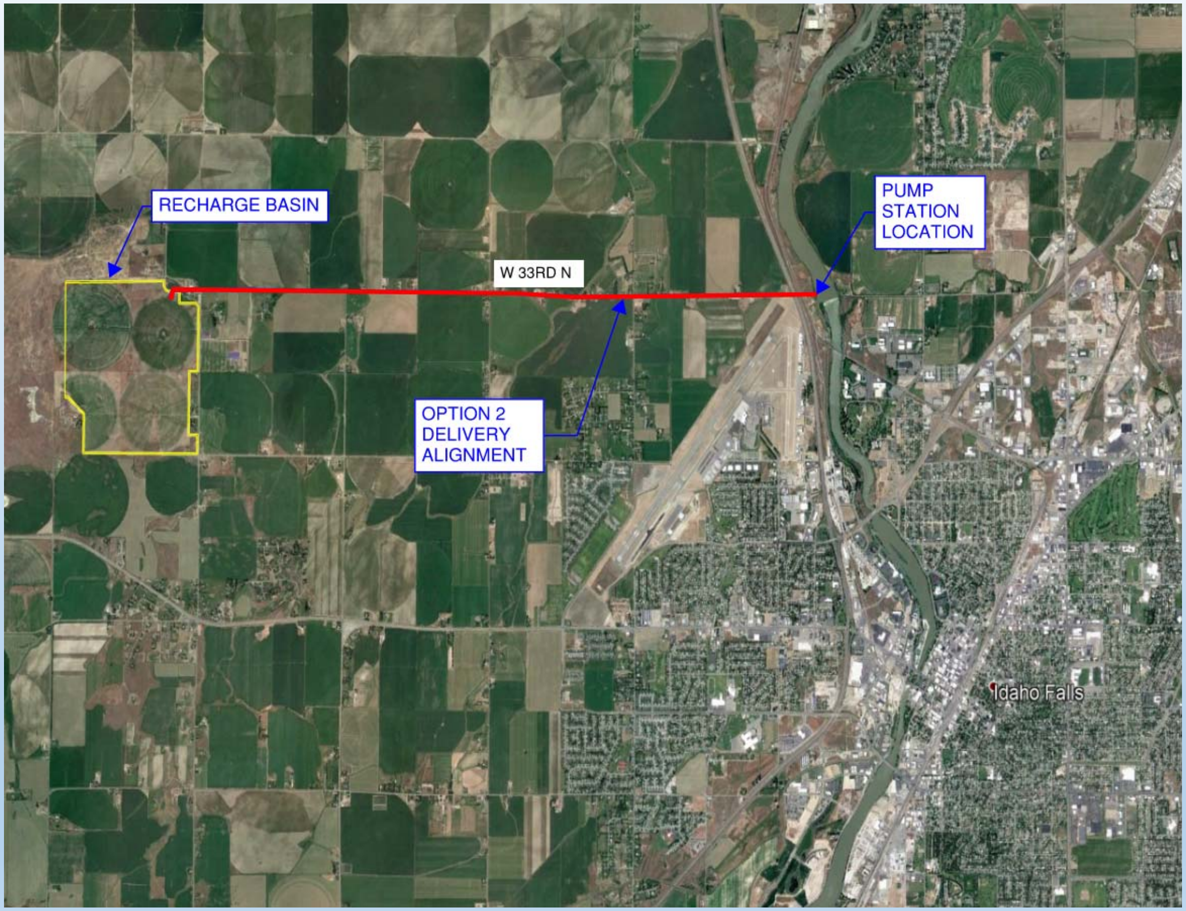
Hells Half Acre - Option 1 Delivery Alignment



Project Summary

- 1 pump @ 100 CFS each
- 2 pumps @ 50 CFS each
- Total maximum power demand = 2,250 HP
- 2 Parallel 60” Dia. Nominal delivery pipelines @ 31,000 LF each
- Pipeline procurement cost ≈$31,000,000

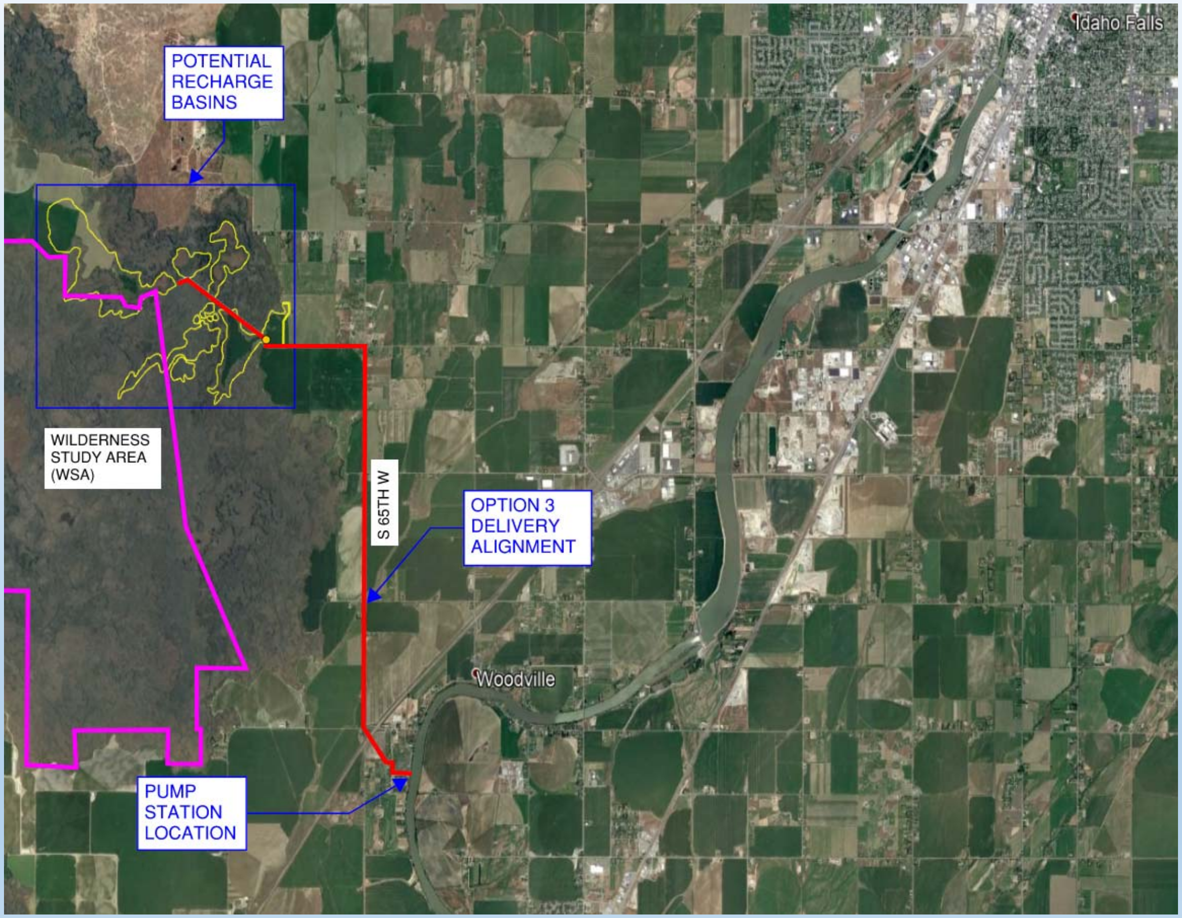
Hells Half Acre – Option 2 Delivery Alignment



Project Summary

- 1 pump @ 100 CFS each
- 2 pumps @ 50 CFS each
- Total maximum power demand = 2,250 HP
- 2 Parallel 60” Dia. Nominal delivery pipelines @ 23,800 LF each
- Pipeline procurement cost ≈$23,800,000

Hells Half Acre – Option 3 Delivery Alignment



Project Summary

- 1 pump @ 100 CFS each
- 2 pumps @ 50 CFS each
- Total maximum power demand = 2,250 HP
- 2 Parallel 60” Dia. Nominal delivery pipelines @ 29,000 LF each
- Pipeline procurement cost ≈$29,000,000

Upper Valley ESPA Recharge Project Investigation

Work In Progress

- Alternative prioritization
- Power service logistics for pumped projects
- Geotechnical investigation at Mud Lake recharge basins
- Refinement of project design details and quantities
- Permitting requirements (Federal, State, Local)
- Project cost estimates/ Benefit Analysis

Questions?

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Memorandum

To: Idaho Water Resource Board

From: Wesley Hipke

Date: August 26, 2021

Re: ESPA Managed Recharge Program Standard and Procedures

Introduction

The Eastern Snake Plain Aquifer (ESPA) Comprehensive Management Plan (CAMP) established a phased approach to address aquifer stabilization with an expectation of adaptive management to allow for adjustments or changes to management techniques. The ESPA Managed Recharge Program (Program), one of the implementation strategies identified in the CAMP, has evolved significantly in the last several years. Based on experience from full-scale operation of the program, a number of procedural issues have been identified which the Program is working on to clarify. This effort will be initiated through the Aquifer Stabilization Committee (Committee) which will review identified issues and develop a set of ESPA Managed Recharge Program "Standards and Procedures" for the IWRB to consider and potentially adopt by resolution.

The current topics staff are going to present to the Committee are summarized in the table below. The topics have been grouped into the following categories: IWRB Minimum Requirements for Conducting Recharge, IWRB Managed Recharge Operations, and Program Standards. Some of the topics should be relatively straight forward as they are formalizing standard practices. However, other issues are more complex and separate memorandums will be provided to provide the necessary background and potential alternatives for consideration. The Program's Standards and Procedures are intended to be updated as new data, issues, and operational understanding improves over time.

Potential Standards and Procedures

The following tables provide a general list of standards and procedures for the Committee to consider.

Definitions of acronyms and recharge program terms used in the following table:

- **ESPAM** – Eastern Snake Plain Aquifer Model
- **MAR** – Managed Aquifer Recharge
- **Recharge Partners** – Entities that the IWRB contracts with to deliver and conduct MAR for the IWRB
- **Retention Rate** – Percentage of recharged water that stays in the aquifer after five years. The percentage is determined using the ESPA Groundwater Model version 2.1.
- **Recharge System** – All the infrastructure used to conduct managed recharge including the diversion structure, delivery system (canals or pipeline), and dedicated recharge sites.
- **UIC Program** – Underground Injection Control Program, administered by IDWR.
- **Travel Time** – Refers to the time it takes for a particle of recharge water in the aquifer to travel to a discharge point.

IWRB ESPA Managed Recharge Program – **Suggested** Standards and Procedures

I. IWRB Managed Aquifer Recharge (MAR) Operations

#	Standard or Procedure	Considerations	Additional Information
I.1	**Executed IWRB MAR Conveyance Contract** Any entities conducting MAR for the IWRB must have an executed conveyance contract with the IWRB.		
I.2	**MAR Partner O&M Responsibilities** Entities contracted to deliver IWRB water for MAR are responsible for all operations, maintenance, management, and liability insurance for all aspects of the system(s) used to conduct MAR.	• IWRB participation in significant maintenance / replacement expenses related to recharge facilities and systems will be considered on a case by case basis.	
I.3	**Monitoring – Recharge Quantity** All entities conducting MAR for the IWRB must have a flow monitoring plan to quantify the amount of MAR conducted.	• The monitoring plan must be approved by IWRB Recharge Program. • The monitoring plan must minimally include: o Monitoring to quantify the volume and rates of water diverted from the source, into off-canal sites, and water exiting the system used for recharge. o Weekly reporting to IWRB.	
I.4	**Monitoring – Water Quality Monitoring Cost** When conducting MAR for the IWRB, cost accrued for water quality monitoring, required by IDEQ or IDWR's UIC program, will be reimbursed.	• Prior approval must be obtained from the IWRB Recharge Program at the start of each recharge season. • IWRB will not pay for water quality sampling and analysis associated with non-IWRB approved recharge. • Yearly summary reports of water quality sampling and analysis must be submitted to the IWRB Recharge Program.	
I.5	**MAR Partner Compliance with other Agencies** IWRB recharge partners must be in compliance with all Federal, State, County, and local government requirements and conditions concerning conducting MAR.	• Example: noxious weed abatement • Any cost or requirements associated for the MAR areas utilized for IWRB recharge shall be the responsibility of the entity conducting recharge unless noted in site specific agreements.	

I. IWRB Managed Aquifer Recharge (MAR) Operations (Cont.)			
#	Standard or Procedure	Considerations	Additional Information
I.6	**IWRB Inspection of Partner MAR Systems** IWRB Recharge Program staff will inspect and be granted authorization to inspect all systems used for MAR at the start of and periodically during IWRB MAR activities.	• Ensure all Monitoring Plan requirements are being met. • The system used for MAR is acceptable under the Program's current Minimum Requirements criteria. • Ensure the system used for to conduct IWRB MAR is in accordance with all IWRB MAR S&P's. • Verify the measurement devices and methodologies are sufficient.	
I.7	**Canals – Period of Use for IWRB MAR** Developing a standardized methodology for determining a canal systems start-up date and an end date for irrigation deliveries.	• Ensuring the IWRB is adding "new" water to the aquifer above "normal" operations of the system. • High variability in systems and weather conditions.	*
I.8	**Canals – Historical Diversion of Non-irrigation Water** If non-irrigation water has been diverted historically during the period IWRB MAR is occurring, the canal can be used for MAR if minimum requirements are met.	• Methodology for determining historical flows. • The volume of water diverted for MAR must be greater than the average historical volumes.	*

II. Minimum Requirements for Conducting IWRB Recharge

#	Standard or Procedure	Considerations	Additional Information
II.1	**Physical Requirements** Minimum system characteristics for conducting IWRB MAR.	• Minimum depth to groundwater from land surface – 20' bls (?) • Minimum steady state infiltration rate – 10 cfs MAR (?) • MAR systems / sites, not located in an area of high groundwater water levels or areas with drains / historic infrastructure to deal with high groundwater levels. (?)	*
II.2	**Aquifer Retention Time** The IWRB MAR must occur in areas with an average minimum five-year retention rate.	• Current limit is 15% • Retention rates as determined by the current IDWR approved Eastern Snake Plain Aquifer Model (ESPAM).	*
II.3	**Canals – Delivering Irrigation Water** When water is diverted for irrigation the canal cannot be used to conduct MAR.	• Canals can be used to transport water to a designated recharge site when delivering irrigation water, however, water lost in the canal cannot be counted as IWRB MAR. • Stipulations for water diverted for uses other than irrigation is covered in section I.7. • "Official" start and stop dates for canals are discussed in section I.8.	
II.4	**Recharge Basins - Purpose** The primary purpose of the basin is for MAR when recharge water is available.	• Irrigated fields or pastures will not be considered as recharge basins for IWRB MAR.	
II.5	**Recharge Basins – Water Quality Compliance** Any basin used for IWRB MAR must be in compliance with all IDEQ requirements.	• Verification from IDEQ of an approved Groundwater Quality Monitoring Plan or the site is exempt from IDEQ *requirements concerning MAR.	
II.6	**Recharge Well – Water Quality Compliance** Any well used for IWRB MAR must be incompliance with IDWR's UIC program.	• Verification from UIC.	

II. Minimum Requirements for Conducting IWRB Recharge (Cont.)

#	Standard or Procedure	Considerations	Additional Information
II.7	**Stream Channels – Limitation of Use for MAR** If natural flow is occurring in the stream channel the channel cannot be used for IWRB MAR.	• IWRB recharge program staff must be consulted and approve the use of stream channels to conduct IWRB MAR.	*

III. Program Standards

#	Standard or Procedure	Considerations	Additional Information
III.1	**IWRB Recharge Season**	• Suggest August 1st through July 31st. • Different than water year or calendar year.	
III.2	**Average Yearly IWRB MAR** Methodology for calculating the average yearly IWRB MAR.	• Only "natural flow" recharge. • Specific method such as a 10-year moving average. (?) • Details used for the methodology such as when to start the calculations (i.e. fall 2014) and when the calculation will be updated (i.e. end of the official IWRB MAR season).	*
III.3	**Distribution of IWRB Recharge Water** Guidance for the distribution of water available for recharge under the IWRB's ESPA Recharge Program.	• Prioritize areas with greater retention rates and diversify the location of IWRB MAR. • Utilize the available IWRB supported MAR capacity. • Advance Program goals. • Separate Processes for the Upper & Lower Valleys.	*
III. 4	**IWRB Recharge Conveyance Fees**	• Fees will be re-evaluated every five years (currently in place in the Lower Valley). • Separate fee structure for the Upper & Lower Valleys.	*
III.5	**IWRB Recharge Program Performance** Evaluation of the Program performance with regard to statutory goals & objectives, impacts and benefits to the aquifer, stream flows, economy, and the environment.	• Coordinate with State Water Plan. • Environmental Coordination. • Determine/clarify requirements and timeframe.	

ESPA Managed Recharge Program Standards & Procedures

Aquifer Stabilization Committee

Wesley Hipke
IWRB Recharge Program Manager
August 27, 2021

IWRB ESPA Managed Aquifer Recharge Program

Background

- ESPA CAMP – 2009: Managed Aquifer Recharge (MAR) established as one of the key strategies to stabilize the ESPA
- Full Scale Program 2014 – 7 years
  - Knowledge / Experience gained in a lot of areas

Why Formalize Standards & Procedures

- Provide Consistency and Transparency across the Program
- Ensure the Program is Meeting the Goals set by the IWRB
- Important for Developing a Long-Term, Sustainable Program

Standards & Procedures

Intention of this Process

- Guidance from the Committee
- Determine what Items the IWRB wants to consider.
- Provide the Committee with the information necessary to determine the Standards & Procedures to move forward.

3 Categories

- MAR Operations
- Requirements for Conducting IWRB MAR
- Programmatic Standards

IWRB MAR Program – Standards & Procedures

I. IWRB MAR Operations

Administrative and Operational requirements:

- Contracts and Monitoring Plans
- Operational Responsibilities & Compliance
- Standardized Methods to determine operational limits for canals conducting IWRB MAR

Standards & Procedures – IWRB MAR Operations

I. Administrative and Operational requirements:

1. Executed IWRB MAR Conveyance Contract
   - Any entity conducting MAR for the IWRB **must** have an executed conveyance contract.
2. Partner O&M Responsibilities
   - Operations, maintenance, management, and liability insurance for all aspects of the system(s) used to conduct MAR are the responsibility of the MAR Partner.
   - IWRB participation in significant expenses related to recharge facilities will be considered on a case by case basis.
3. Partner Flow Monitoring Plans – Recharge Quantity
   - All entities conducting IWRB MAR must have an approved flow monitoring plan.

Standards & Procedures – IWRB MAR Operations

I. Administrative and Operational requirements (cont.):

4. Water Quality Monitoring Cost
   - When conducting MAR for the IWRB, cost accrued for water quality monitoring, required by IDEQ or IDWR's UIC program, will be reimbursed. Yearly reports must be submitted to IWRB.
5. Partner Compliance with other Agencies
   - IWRB recharge partners must be in compliance with all Federal, State, County, and local government requirements and conditions concerning conducting MAR.
6. Inspection of Partner MAR Systems used for IWRB Recharge
   - IWRB Recharge Program staff will inspect and be granted authorization to inspect all systems used for MAR at the start of and periodically during IWRB MAR activities.

Standards & Procedures – IWRB MAR Operations

I. Administrative and Operational requirements (cont.):

7. Canals - Period of use for IWRB MAR*
    - Standardized method for determining canal start and end dates for conducting IWRB MAR.
    - Memo outlining potential methodology to be presented at next meeting.
8. Canals – Historical Diversion of Non-irrigation Water*
    - If non-irrigation water has been diverted historically during the period IWRB MAR is occurring, the canal can be used from MAR if minimum requirements are met.
    - Memo outlining potential methodology to be presented at next meeting.

* More information to be provided

IWRB MAR Program – Standards & Procedures

II. Conducting Recharge for the IWRB

Minimum Requirements for Recharge Partners:

- Potential Physical Requirement for Recharge Sites and Areas:
  - Aquifer Retention
  - Local Water Table Properties
- Limitations of when Canals, Basins, Recharge Wells, and Stream Channels can be used for IWRB MAR

Standards & Procedures – Minimum Requirements

II. IWRB MAR Minimum requirements:

1. Minimum MAR System Physical Hydrological Characteristics*
   - Minimum depth to groundwater = 20 ft below land surface. - ??
   - System steady-state infiltration rates greater than 10 cfs. - ??
2. Minimum Aquifer Retention Time*
   - The IWRB MAR must occur in areas with an average minimum five-year retention above _____? (Current limit is greater than 15%)
   - As determined by the most recent official IDWR ESPA groundwater model.
3. Canals – Canal can not be used for IWRB MAR if also delivering water for irrigation.
4. Recharge Basin – Primary purpose of the basin must be for MAR

* More information to be provided

Standards & Procedures – Minimum Requirements

II. IWRB MAR Minimum requirements (cont.):

5. Recharge Basin – Water Quality Compliance
   - Any basin used for IWRB MAR must be in compliance with all IDEQ requirements.
6. Recharge Well – Water Quality Compliance
   - Any injection/recharge well used for IWRB MAR must be in compliance with IDWR's UIC program.
7. Stream Channels – Limitation of Use for IWRB MAR*
   - If natural flow is occurring the stream channel cannot be used for IWRB MAR.
   - IWRB MAR in a stream channel must be approved by the IWRB before use.

* More information to be provided

IWRB MAR Program – Standards & Procedures

III. Programmatic Standards

Standards related to the internal operations of the IWRB MAR Program:

- Calculation of average yearly IWRB ESPA recharge
- Distribution of available water for recharge
- Conveyance Fees
- Evaluation of Program Performance

Standards & Procedures – Minimum Requirements

III. IWRB ESPA MAR Program Standards:

1. IWRB Recharge Season
   - Suggest August 1st through July 31st – Staff Suggestion
2. IWRB MAR Yearly Average*
   - Methodology for calculating the average yearly IWRB MAR.
3. Distribution of IWRB Recharge*
   - Guidance for the distribution of water available for recharge under the IWRB's ESPA Recharge Program.
4. IWRB Recharge Conveyance Fees*
   - Fees re-evaluated every five years.
5. IWRB Recharge Program Performance

* More information to be provided

Questions