Memorandum

To: Idaho Water Resource Board

From: Craig Tesch

Date: September 9, 2019

Re: Raft River Basin Hydrologic Project Funding Proposal

REQUIRED ACTION: Action required at the September 20, 2019 IWRB meeting.

Attached is a resolution for the IWRB to consider at the September 20 meeting. The resolution is for funding the first year of a five-year hydrologic characterization of the Raft River Basin.

I. Background

The Raft River Basin in southeastern Idaho contributes underflow as a tributary basin to the Eastern Snake Plain Aquifer. The basin is located in a Critical Ground Water Area with large water level declines (average=1.74 ft/yr), and contains approximately 117,000 acres of agriculture that depend on a sustainable water supply. The area also supports the Raft River Geothermal plant, the only operating commercial geothermal power generation facility in Idaho. The last comprehensive study of the basin was done 40 years ago by the United States Geological Survey (USGS).

The Idaho Department of Water Resources (IDWR) is pursuing $203,580 from the IWRB for the first year of a five-year study of the Raft River Basin. IDWR will pursue Department of Energy (DOE) funding through the Supplemental Environmental Project (SEP) process for the remaining four years. IDWR will oversee the project, the Idaho Geologic Survey (IGS) will conduct the project, and field assistance will be provided by an IDWR contractor. If DOE SEP funding is not available after the first year, IDWR and IGS will explore other funding options and the ability of staff to self-perform various tasks.

The objectives of the first year are to compile and assess existing data, develop a data repository, identify data gaps for future project phases, and expand the IDWR monitoring network with existing wells in the basin.

II. Project Summary – Year 1

The following provides a summary of funding requested by IDWR from the IWRB for Year 1 of the Raft River Hydrologic Project.

Agency	Summary	IWRB Funds
	Year 1 (10/1/19-10/1/20) – Phase 1a	
IGS	Data gathering and analysis	$107,541
IWRRI	Contractor for field work and data processing	$96,000
	Total	**$203,580**

III. Project Summary – All Years

The following provides a summary of the entire project and shows funding IDWR will pursue through the DOE SEP process for Years 2-5. Additionally, IDWR anticipates requesting additional funds in the future from the IWRB to maintain a field contractor for Years 2-5.

Agency	Summary	IWRB Funds	DOE Funds	Total Cost
	Year 1 (10/1/19-10/1/20) – Phase 1a			
IGS	Data gathering and analysis	$107,541		
IWRRI	Contractor for field work and data processing	$96,000		
	Subtotal	**$203,580**		**$203,580**
	Year 2 (10/1/20-10/1/21) – Phase 1b			
USGS	Stream gages (9 gages)		$99,000	
USGS	Seepage studies (2 runs)		$50,000	
IGS	Drilling wells (12 wells)		$612,487	
IGS	Pumps (12 wells)		$84,000	
USGS	Geophysics (12 wells)		$84,000	
IGS	Water Quality (12 wells)		$10,200	
USBR	Agrimet Station (1 station)		$10,000	
IGS	IGS Staff/Overhead		$358,257	
IWRRI	Contractor for field work and data processing	$96,000		
	Subtotal	**$96,000**	**$1,307,944**	**$1,403,944**
	Years 3-5 (10/1/21-10/1/24) – Phase 2			
IGS	Hydrologic conceptual model & water budget		$252,890	
USGS	Seepage studies (2 runs)		$50,000	
USGS	Stream gage O&M (3 years)		$216,000	
IGS	Overhead (20%)		$103,777	
IWRRI	Contractor for field work and data processing (3 years)	$288,000		
	Subtotal	**$288,000**	**$622,667**	**$910,667**
	Total Project	**$587,580**	**$1,930,611**	**$2,518,191**

Funding Proposal for Raft River Basin Hydrologic Investigation

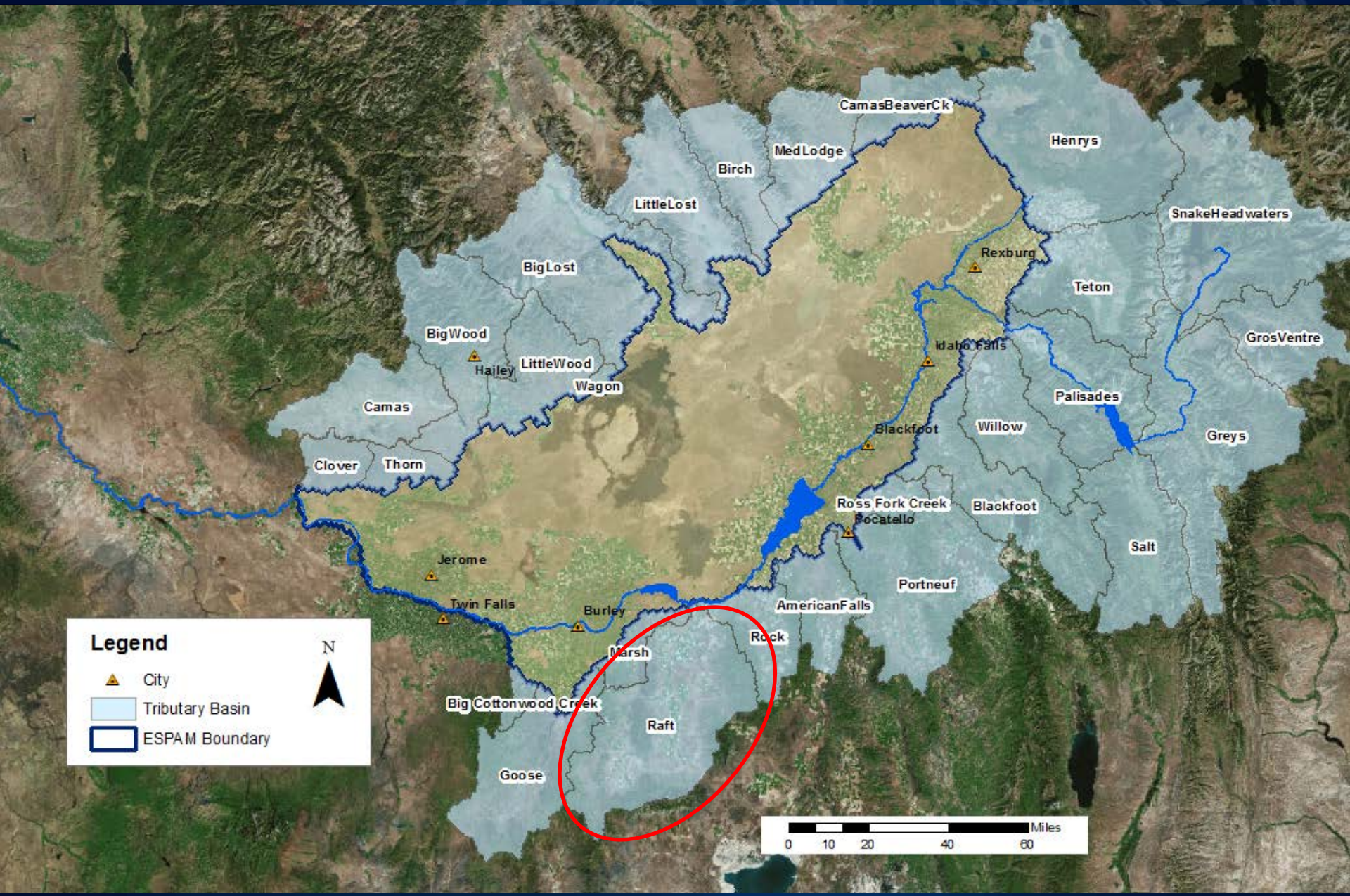
Presented by Craig Tesch, P.G.

September 19, 2019

Raft River Basin Importance

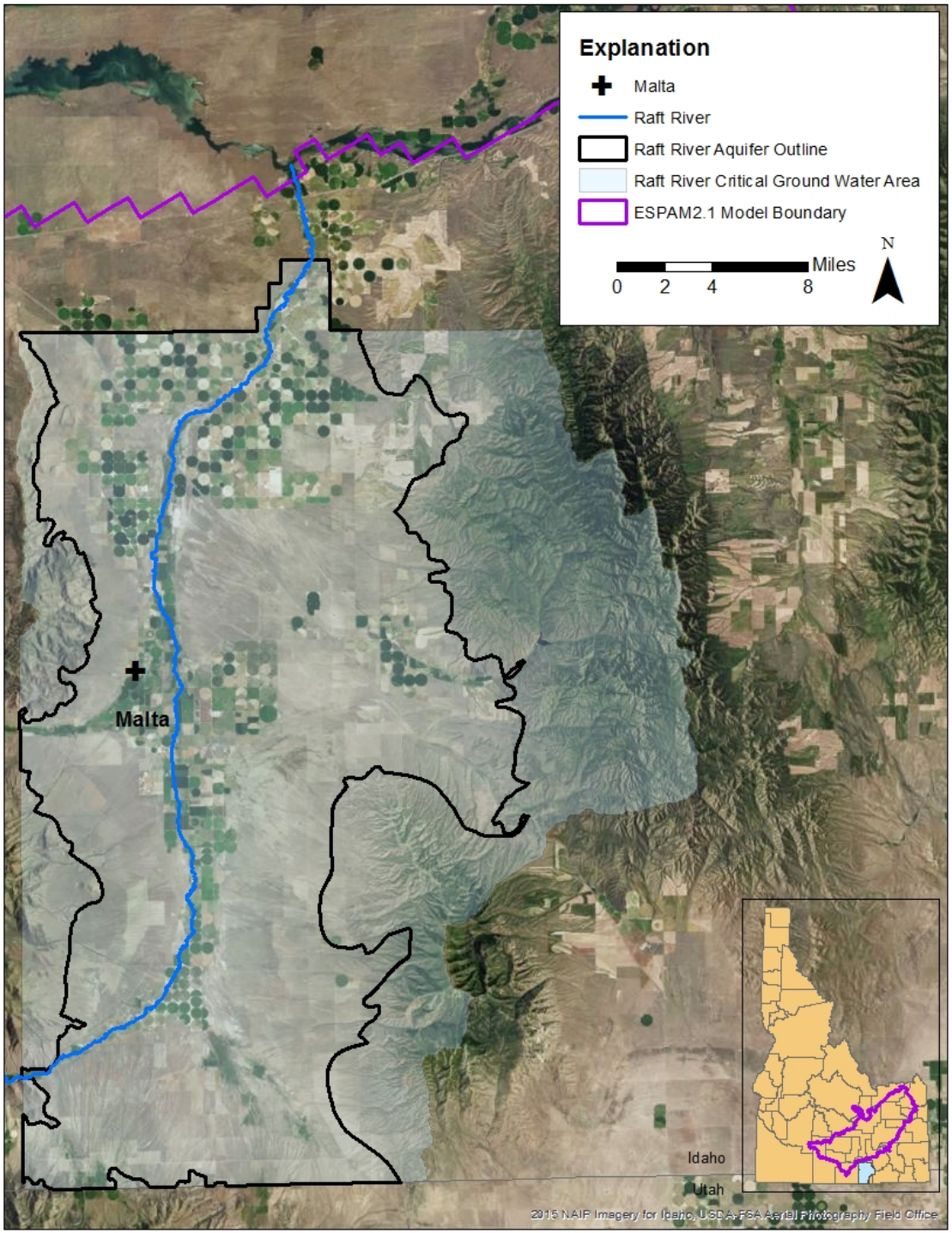
- Contributes underflow as a tributary basin to the ESPA

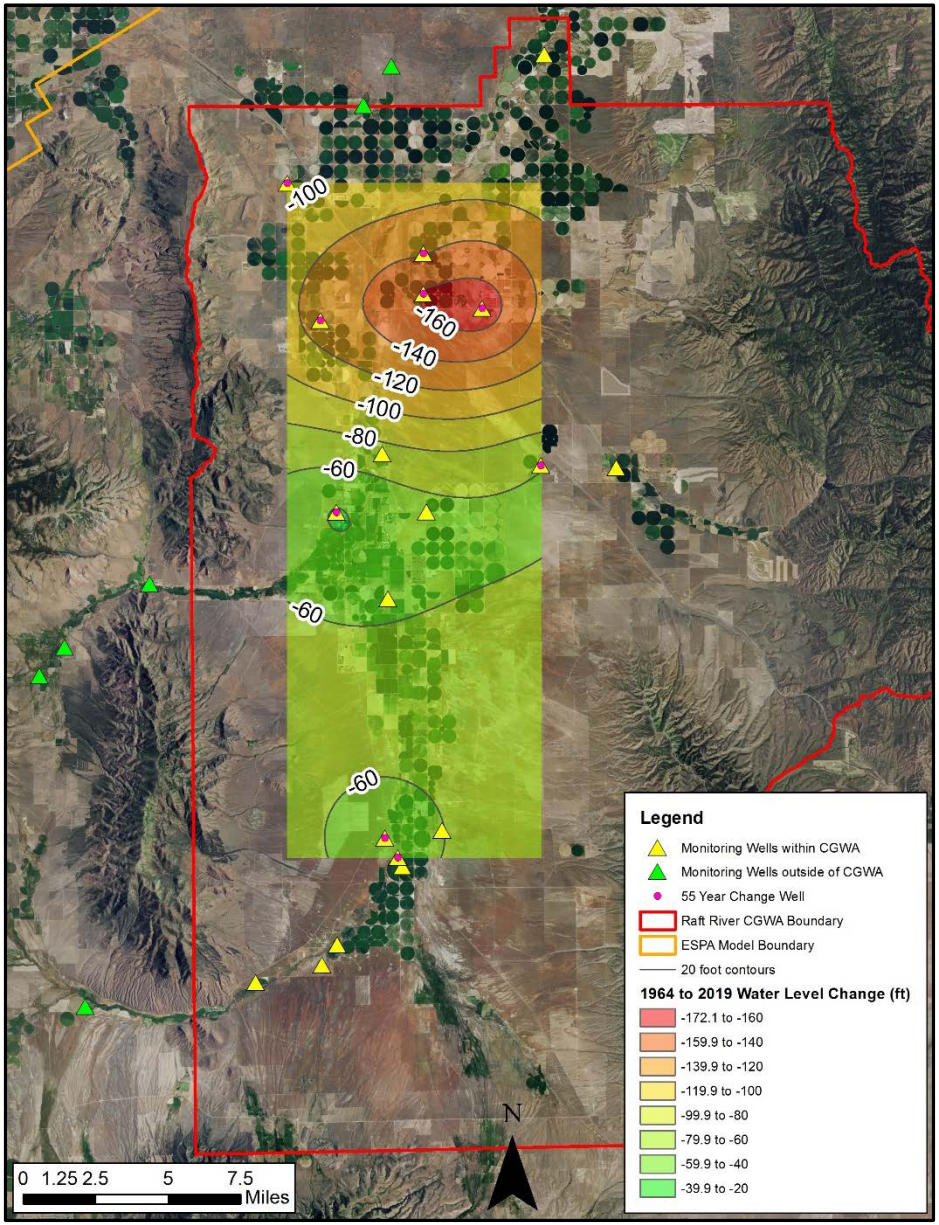
IDAHO Department of Water Resources

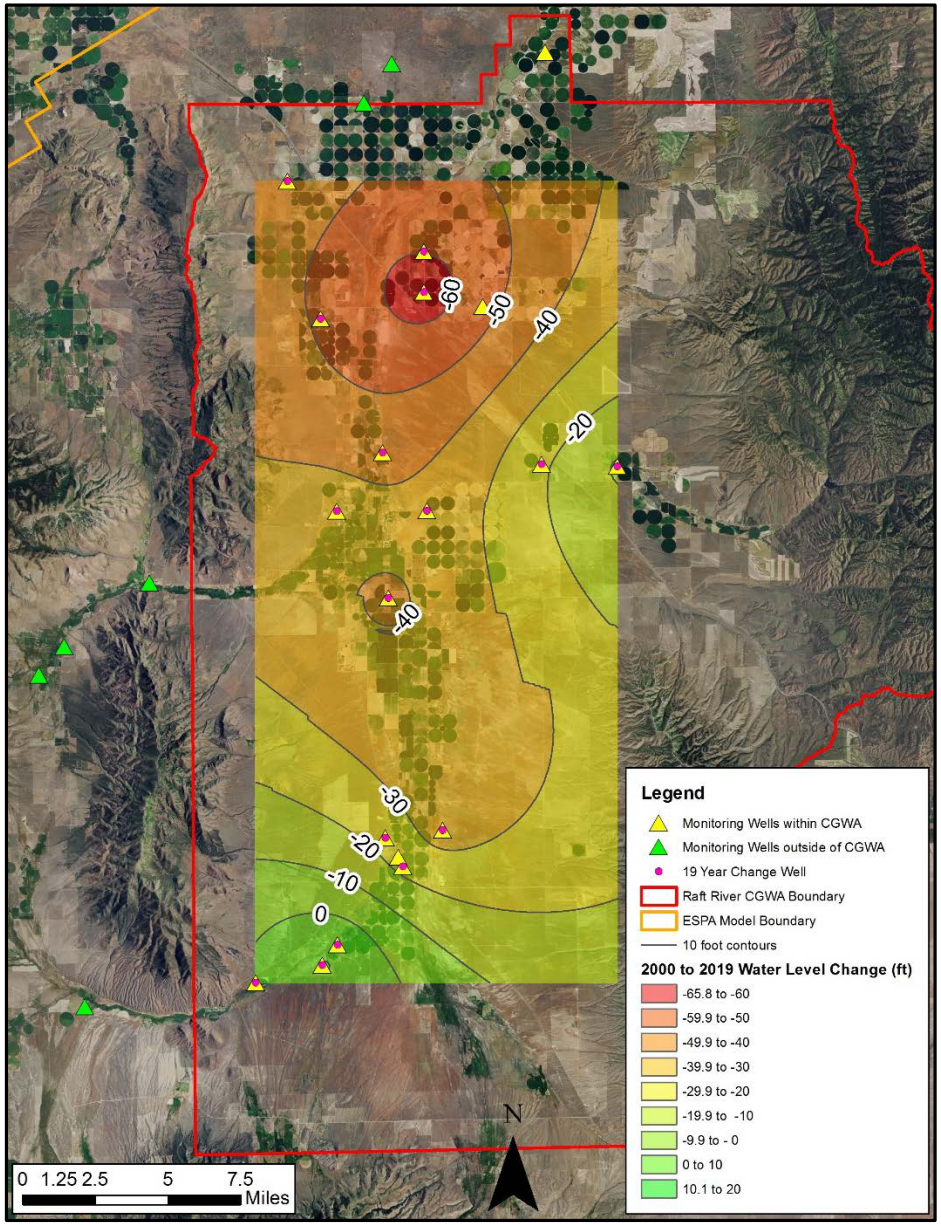


Raft River Basin Importance

- Contributes underflow as a tributary basin to the ESPA
- Located in a Critical Ground Water Area (1963) with large ground water level declines (average=1.74 ft/yr)
- Contains 117,000 acres of agriculture that depend on a sustainable water supply for irrigation


Explanation
Malta
Raft River
Raft River Aquifer Outline
Raft River Critical Ground Water Area
ESPAM2.1 Model Boundary
Miles
0 2 4 8
N
Malta
Idaho
Utah
2015 NAIP Imagery for Idaho, USDA-FSA Aerial Photography Field Office



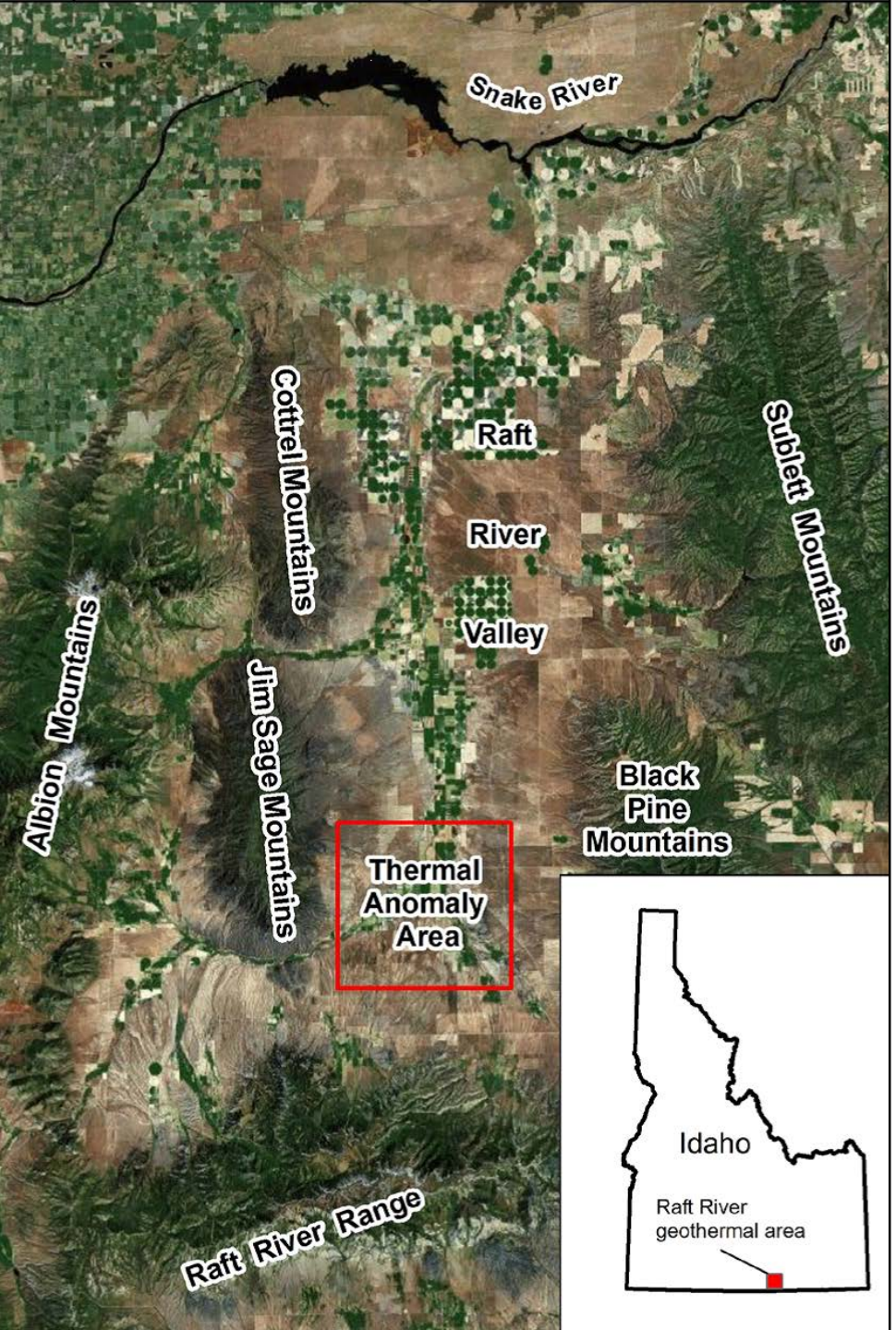


55-Year Water Level Change

19-Year Water Level Change

Raft River Basin Importance

- Contributes underflow as a tributary basin to the ESPA
- Located in a Critical Ground Water Area (1963) with large ground water level declines (average=1.74 ft/yr)
- Contains 117,000 acres of agriculture that depend on a sustainable water supply for irrigation
- Land subsidence in northern portion of the basin
- TMDLs on several streams
- Supports the Raft River Geothermal plant, the only operating commercial geothermal power generation facility in Idaho



Hydrogeology

- Folded, faulted, and eroded mountains
- Structurally depressed valley areas containing thick sediments
- IDWR monitoring network (26 wells)
  - Well depth: 88’ to 1020’ BGL
  - Water levels: 13’ to 302’ BGL
  - Water temperatures: 50° to 117°F
- Geothermal resource: temperatures up to 150°C (302°F) at depths between 1,500m and 2,000m

Proposal Overview

- Department staff are proposing a 5-year hydrologic characterization of the Raft River Basin
- Idaho Geologic Survey (IGS) will lead the project, with oversight by IDWR & IWRB
- IDWR will hire a contractor to provide additional data processing and field support

Proposal Overview (cont.)

- First year: IGS & IDWR data gathering effort funded by the IWRB
- Following years: IDWR will pursue DOE funding for the IGS to continue their work
- Proposal components similar to the Big Lost DOE SEP
  - Data compilation and collection, well drilling, gaging, water quality, conceptual model, water budget

Characterization the Raft River Basin

Overall Objectives:

- Collect information to help characterize basin hydrology
  - Concerns about declining groundwater levels & water supply
  - Last comprehensive study was 40 years ago (USGS, 1979)
  - Relationship between the ESPA and Raft basin
- Quantify groundwater-surface water interactions between the Raft River and aquifer
- Characterize recharge and discharge mechanisms
- Improve ESPAM calibration

Funding Proposal - Year 1

Objectives:

- Compile & assess existing data
  - 40 years of data collection by IDWR & USGS
  - Develop data repository
- Identify data gaps
- Add existing wells to IDWR monitoring network

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IDWR Funding Proposal for Raft River Project

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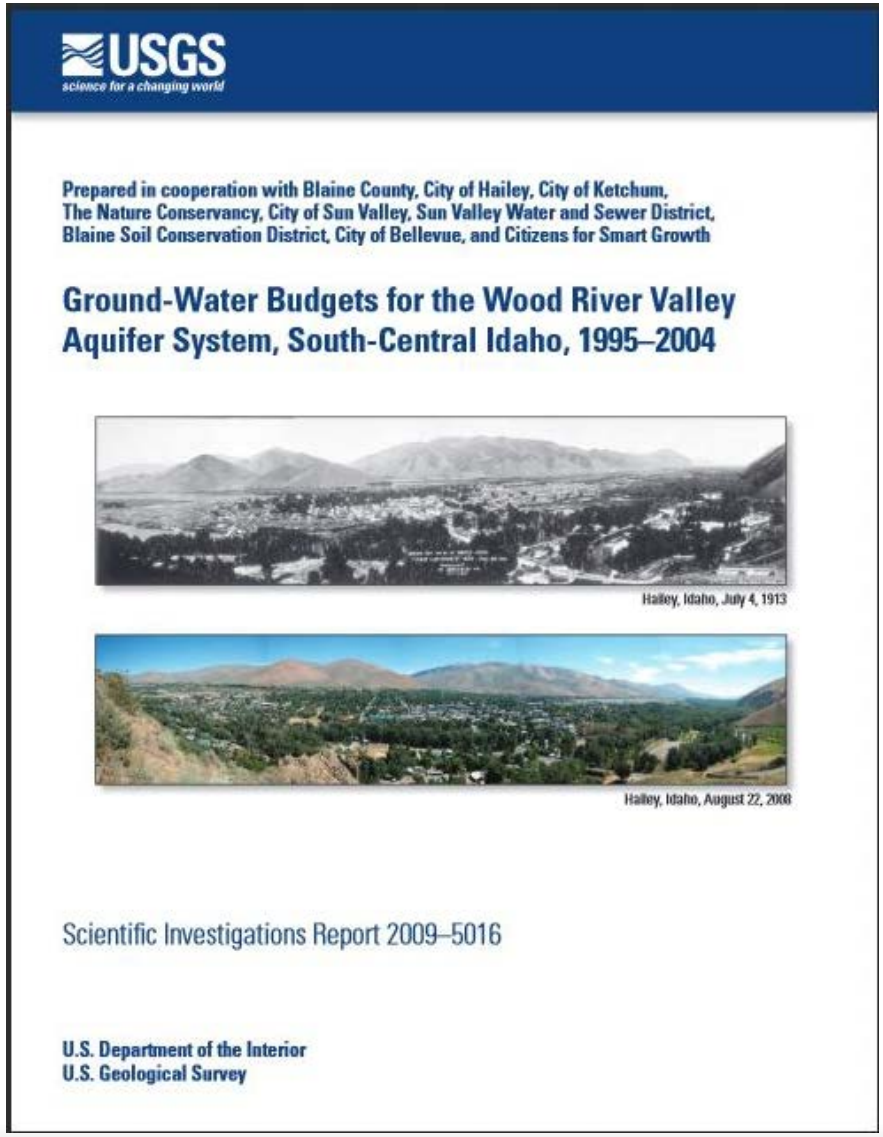
Products

- Monitoring Infrastructure
- Data Repository
- Water Budget Report
- Hydrogeologic Framework Report

Data Foundation

Data collection efforts, in combination with a water budget and hydrogeologic framework, will provide an understanding of basin hydrology needed to launch into future modeling efforts.



USGS
science for a changing world

Prepared in cooperation with Blaine County, City of Hailey, City of Ketchum, The Nature Conservancy, City of Sun Valley, Sun Valley Water and Sewer District, Blaine Soil Conservation District, City of Bellevue, and Citizens for Smart Growth

Ground-Water Budgets for the Wood River Valley Aquifer System, South-Central Idaho, 1995–2004

Hailey, Idaho, July 4, 1913

Hailey, Idaho, August 22, 2008

Scientific Investigations Report 2009–5016

U.S. Department of the Interior
U.S. Geological Survey

Summary

- Department staff are proposing a 5-year hydrologic study of the Raft River Basin
- IDWR staff are requesting funding authorization of $203,580 from the IWRB for Year 1 of the study
- Total funding request for the IWRB over the 5-year study will be $587,580

Questions?