Funding Proposal for Raft River Basin Hydrologic Investigation

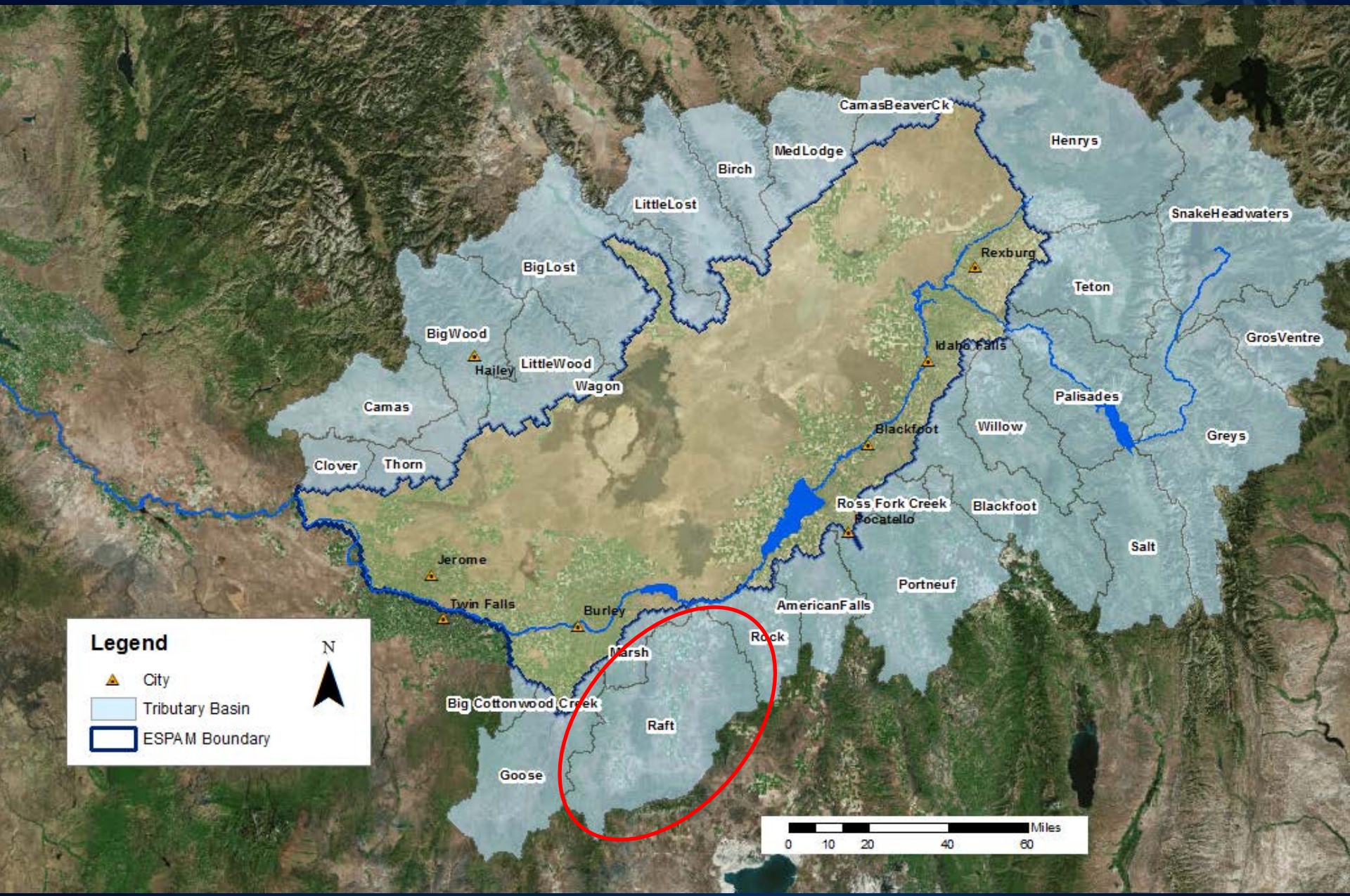
Presented by Craig Tesch, P.G.

September 19, 2019

Raft River Basin Importance

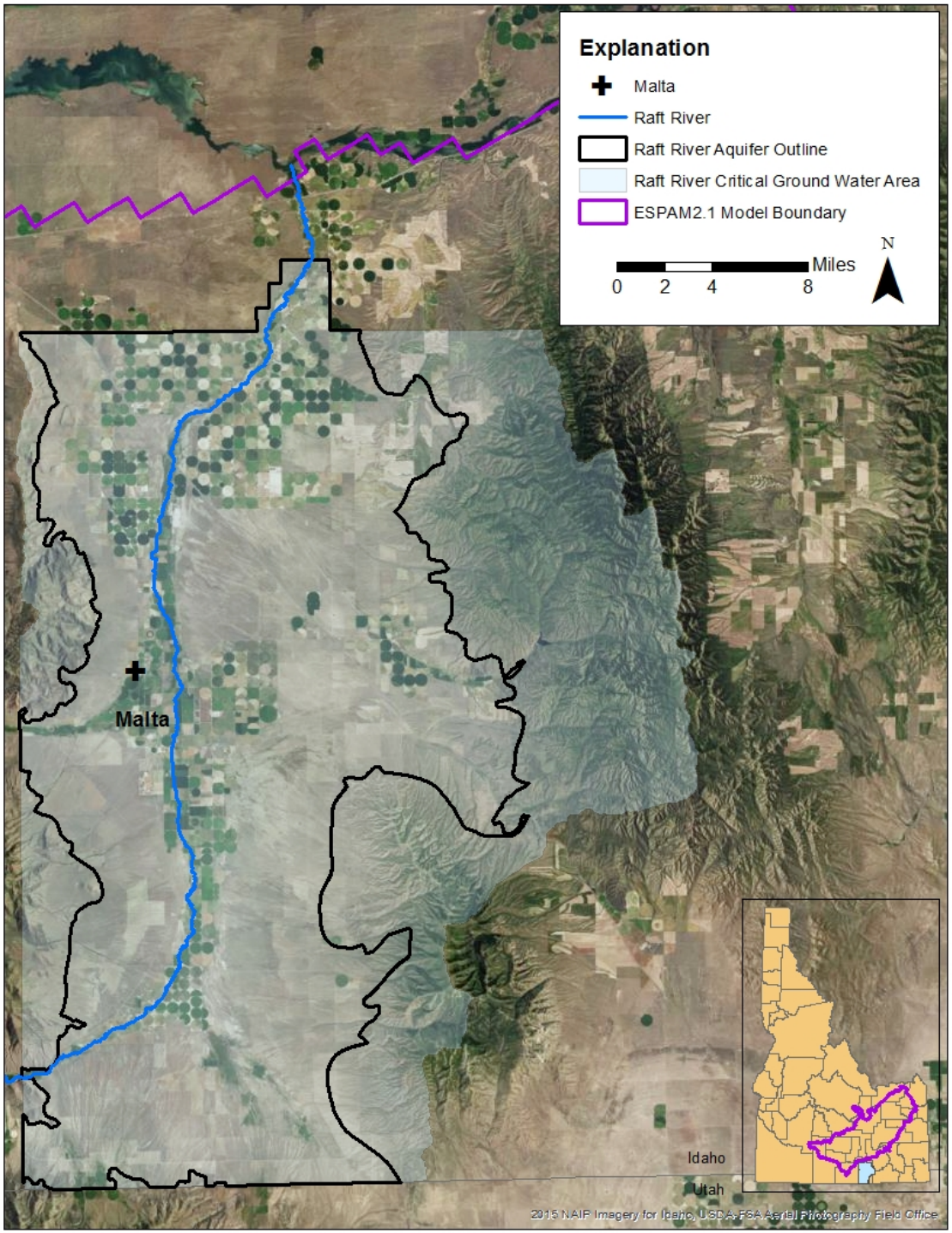
- Contributes underflow as a tributary basin to the ESPA

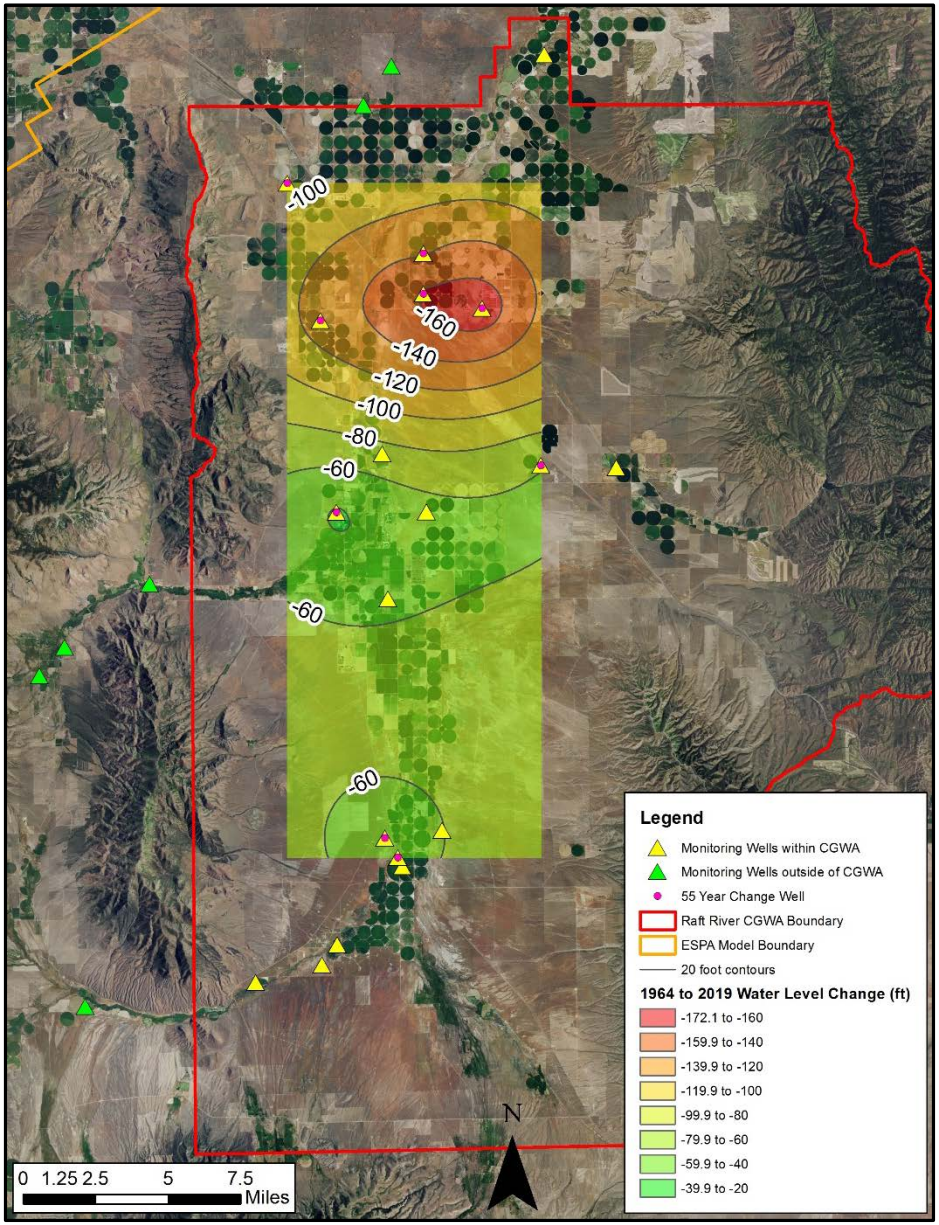
IDAHO Department of Water Resources

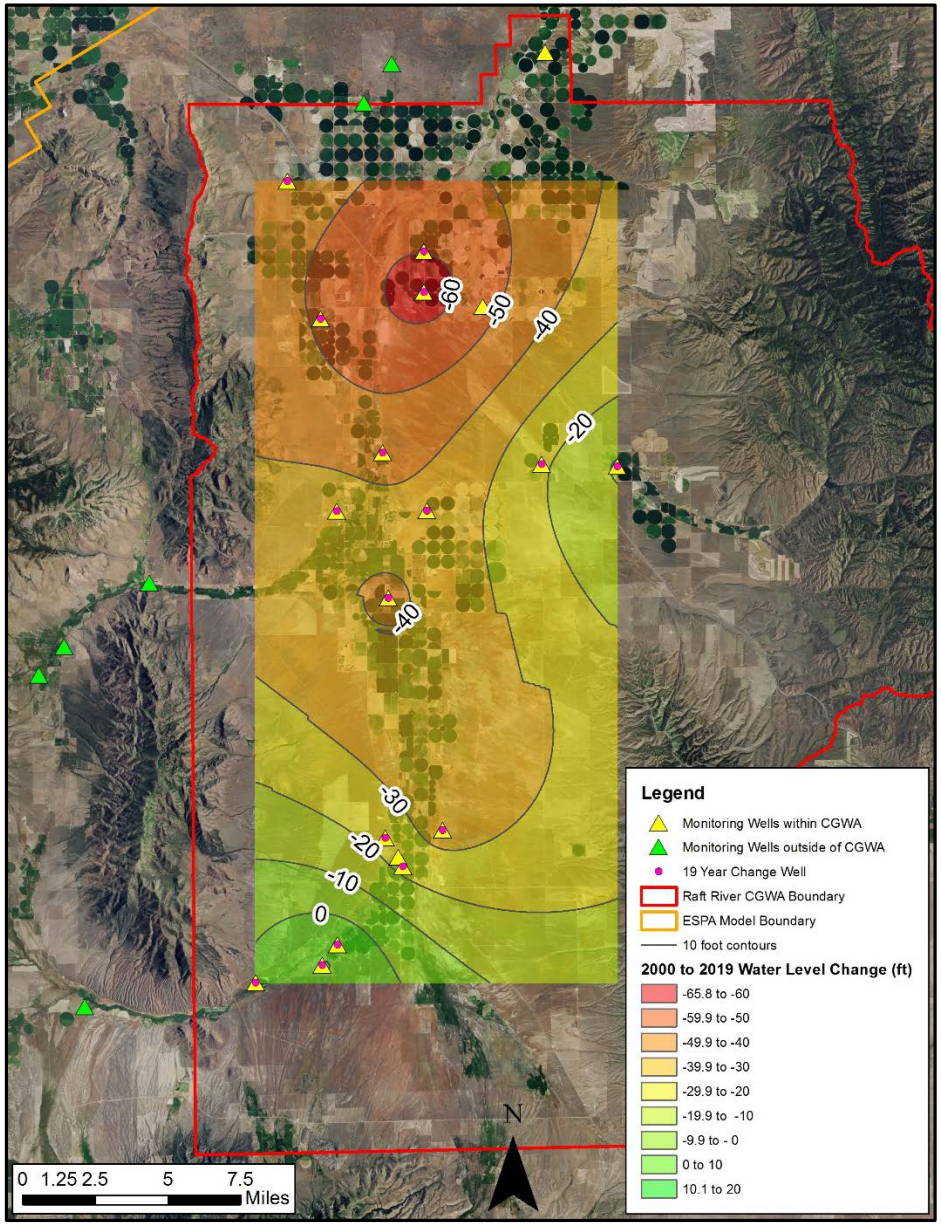


Raft River Basin Importance

- 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



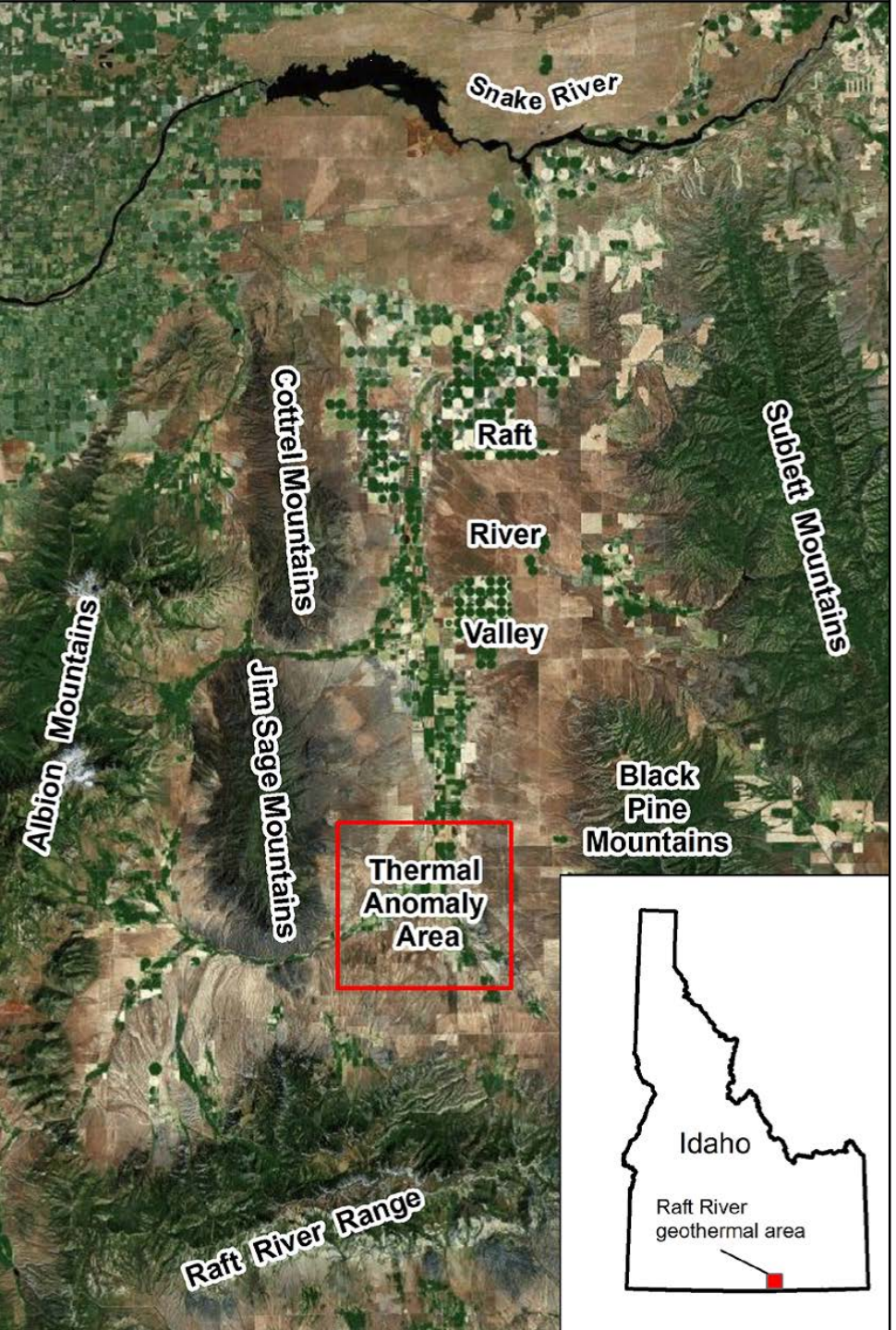


55-Year Water Level Change

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

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

IDWR Funding Proposal for Raft River Project

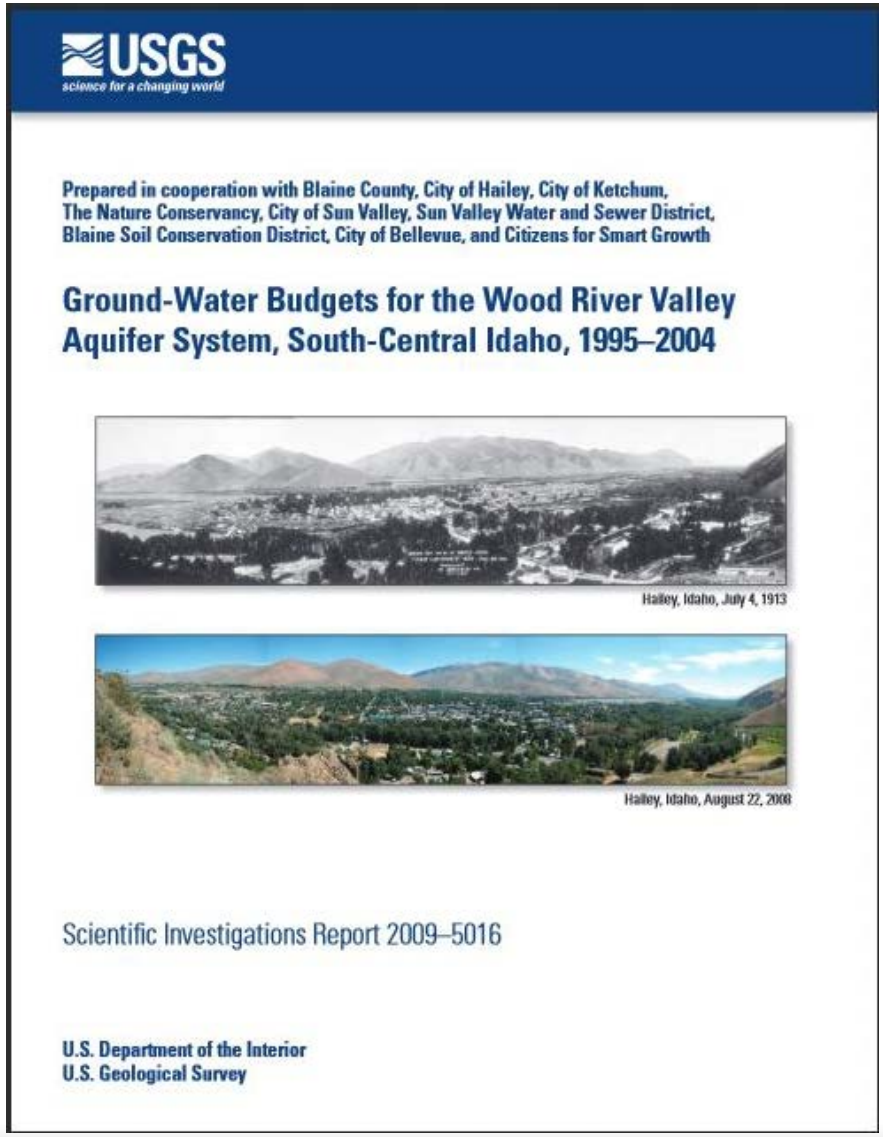
Agency	Summary	IWRB Funds	DOE Funds	Total Cost
	Year 1 (10/1/19-10/1/20) – Phase 1a			
IGS	Data gathering and analysis	$107,580		
IWRRI	Contractor for field work and data processing	$96,000		
	Subtotal	**$203,580**		**$203,580**
	Year 2 (10/1/20-10/1/21) – Phase 1b			
USGS	Stream gages (9 gages)		$99,000	
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	$288,000		
	Subtotal	**$288,000**	**$622,667**	**$910,667**
	Total	**$587,580**	**$1,930,611**	**$2,518,191**

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?

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF RAFT RIVER BASIN HYDROLOGIC PROJECT TO SUPPORT ESPA RECHARGE AND MODELING EFFORTS	A RESOLUTION TO APPROVE FUNDING FOR YEAR ONE OF THE RAFT RIVER BASIN HYDROLOGIC PROJECT

WHEREAS, House Bill 547 passed and approved by the 2014 Legislature allocates $5 million annually through 2019 from the Cigarette Tax to the Idaho Water Resource Board's (IWRB) Secondary Aquifer Planning, Management, and Implementation Fund (Secondary Aquifer Fund) for statewide aquifer stabilization; and

WHEREAS, House Bill 256 passed and approved by the 2019 Legislature allocated $5 million in ongoing General Fund dollars to the IWRB's Secondary Aquifer Fundy to statewide water sustainability and aquifer stabilization; and

WHEREAS, many aquifers across Idaho are declining or have existing or potential conjunctive administration water use conflicts, including the Eastern Snake Plain Aquifer (ESPA), which has been losing approximately 216,000 acre-feet annually from aquifer storage since the 1950's resulting in declining ground water levels in the aquifer and declining spring flows from the aquifer; and

WHEREAS, the State Water Plan, approved by the 2012 Legislature, recognized that measurement, data collection, quantification and monitoring of Idaho's water supply and use are essential for sound water resource planning, management and administration; and

WHEREAS, the Sustainability Policy Section of the State Water Plan identifies the need to obtain more accurate water supply, water measurement and forecasting information, and a need to disseminate water supply forecast to water users in cooperation with other federal and state agencies; and

WHEREAS, the State Water Plan includes a goal to accomplish managed recharge in the ESPA averaging 250,000 acre-feet annually; and

WHEREAS, the 2016 Idaho Legislature passed and approved Senate Concurrent Resolution 136 directing the IWRB to develop the capacity to achieve 250,000 acre-feet of annual average managed recharge to the ESPA by December 31, 2024; and

WHEREAS, the Raft River Basin contributes tributary underflow to the ESPA, was designated a Critical Ground Water Area in 1963, and is experiencing large groundwater level declines. It contains 117,000 acres of agriculture dependent on a sustainable water supply and supports the only operating commercial geothermal power plant in Idaho; and

WHEREAS, the last comprehensive hydrologic study of the Raft River Basin was conducted 40 years ago by the United States Geologic Survey; and

DRAFT

WHEREAS, the Idaho Department of Water Resources (IDWR) and the Idaho Geologic Survey developed a proposal for a five-year hydrologic characterization of the Raft River Basin (Raft River Basin Hydrologic Project, "project") which involves data gathering and analysis, installation of stream gages and monitoring wells, seepage studies, and development of a conceptual hydrologic model and water budget; and

WHEREAS, the project is broken into multiple phases. Phase 1a, to be accomplished in the first year, will include compilation and assessment of existing data, development of a data repository, identification of data gaps, and expansion of the IDWR monitoring network for an estimated cost of $204,000; and

WHEREAS, subsequent phases involve installation of measurement and monitoring equipment, additional data collection, performing seepage studies, and development of a conceptual hydrologic model and water budget; and

WHEREAS, IDWR seeks funding from the IWRB to complete the Phase 1a of the project and proposes to pursue Department of Energy funding through the Supplemental Environmental Project process for the majority of expenses associated with subsequent phases over the remaining four years of the project; and

NOW THEREFORE BE IT RESOLVED that the IWRB authorizes expenditures not to exceed $204,000 in Fiscal Year 2020 from the Secondary Aquifer Fund for expenses associated with Phase 1a of the Raft River Basin Project.

BE IT FURTHER RESOLVED that the IWRB authorizes its chairman or designee, Brian Patton, to execute the necessary agreements or contracts to implement the Raft River Basin Project.

DATED this 20th day of September, 2019.

_____
ROGER W. CHASE, Chairman
Idaho Water Resource Board

ATTEST _____
VINCE ALBERDI, Secretary