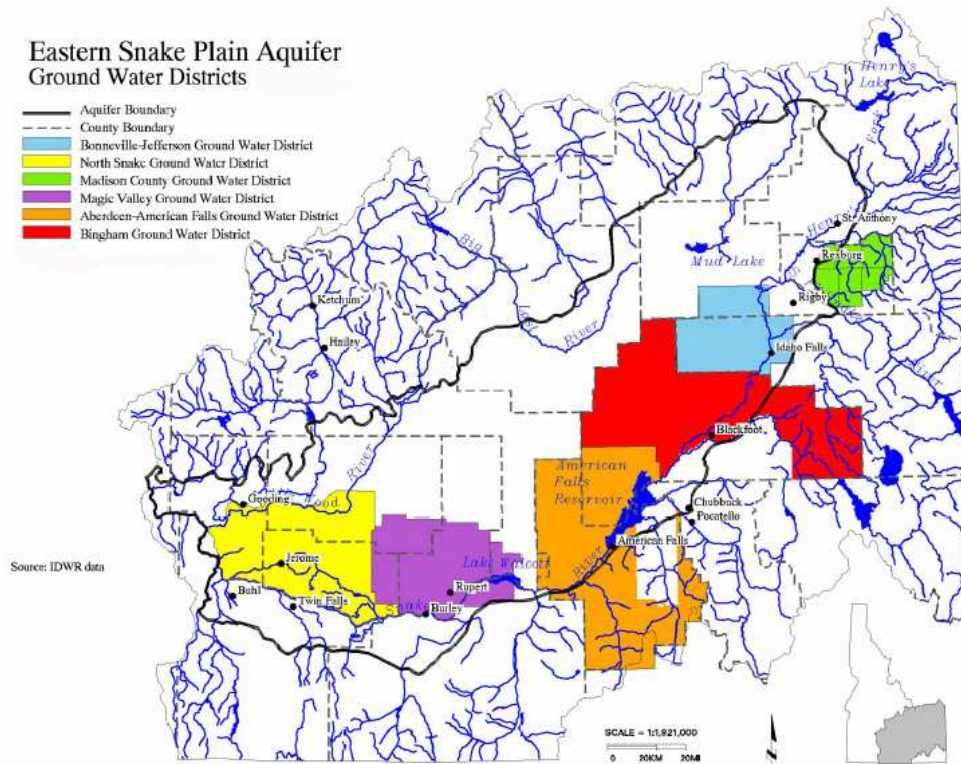


Climate Change Economic Impacts in the Middle & Upper Snake River



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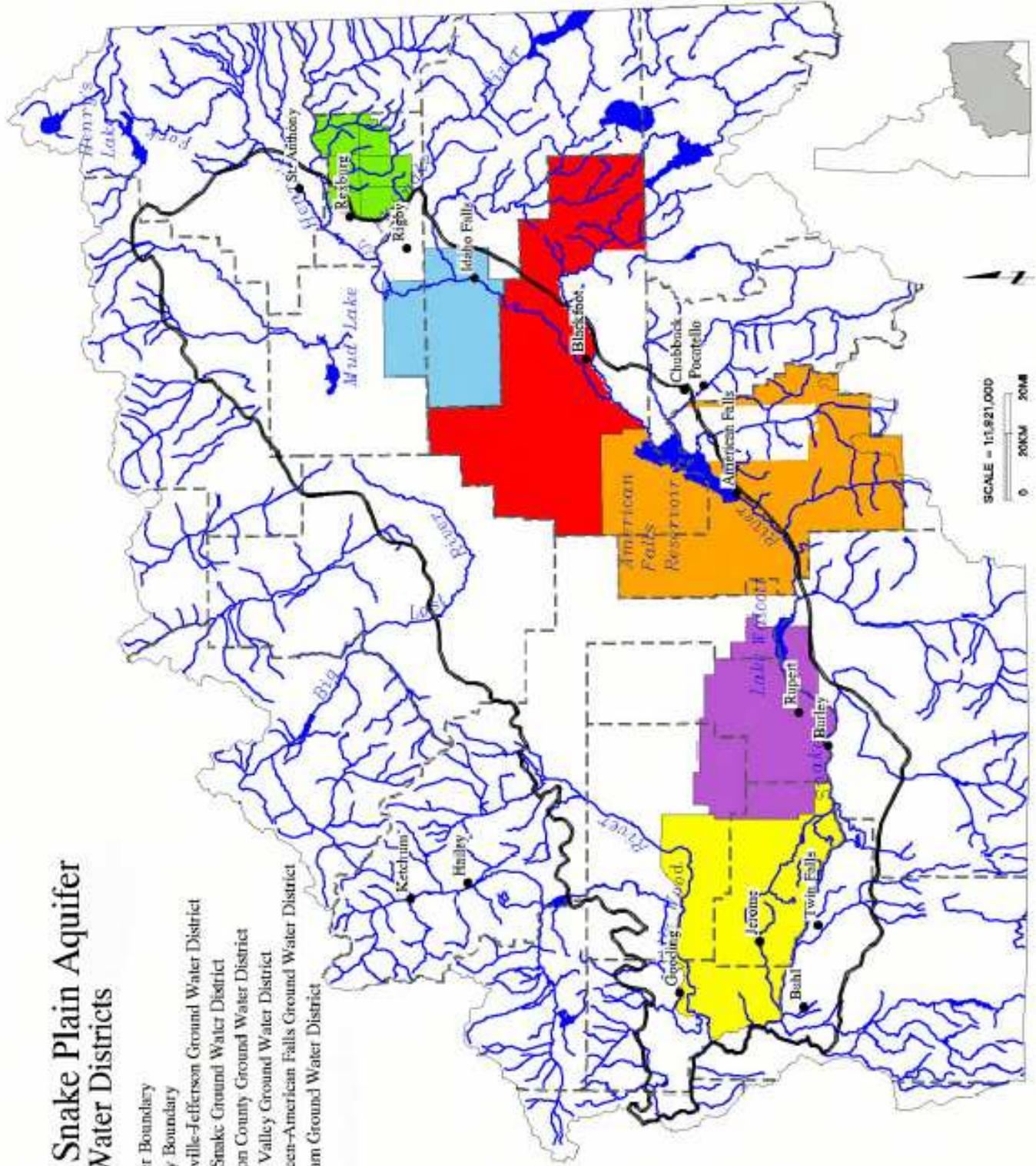


Supported by
National Oceanic and Atmospheric Administration
Office of Global Programs

The geography

Eastern Snake Plain Aquifer Ground Water Districts

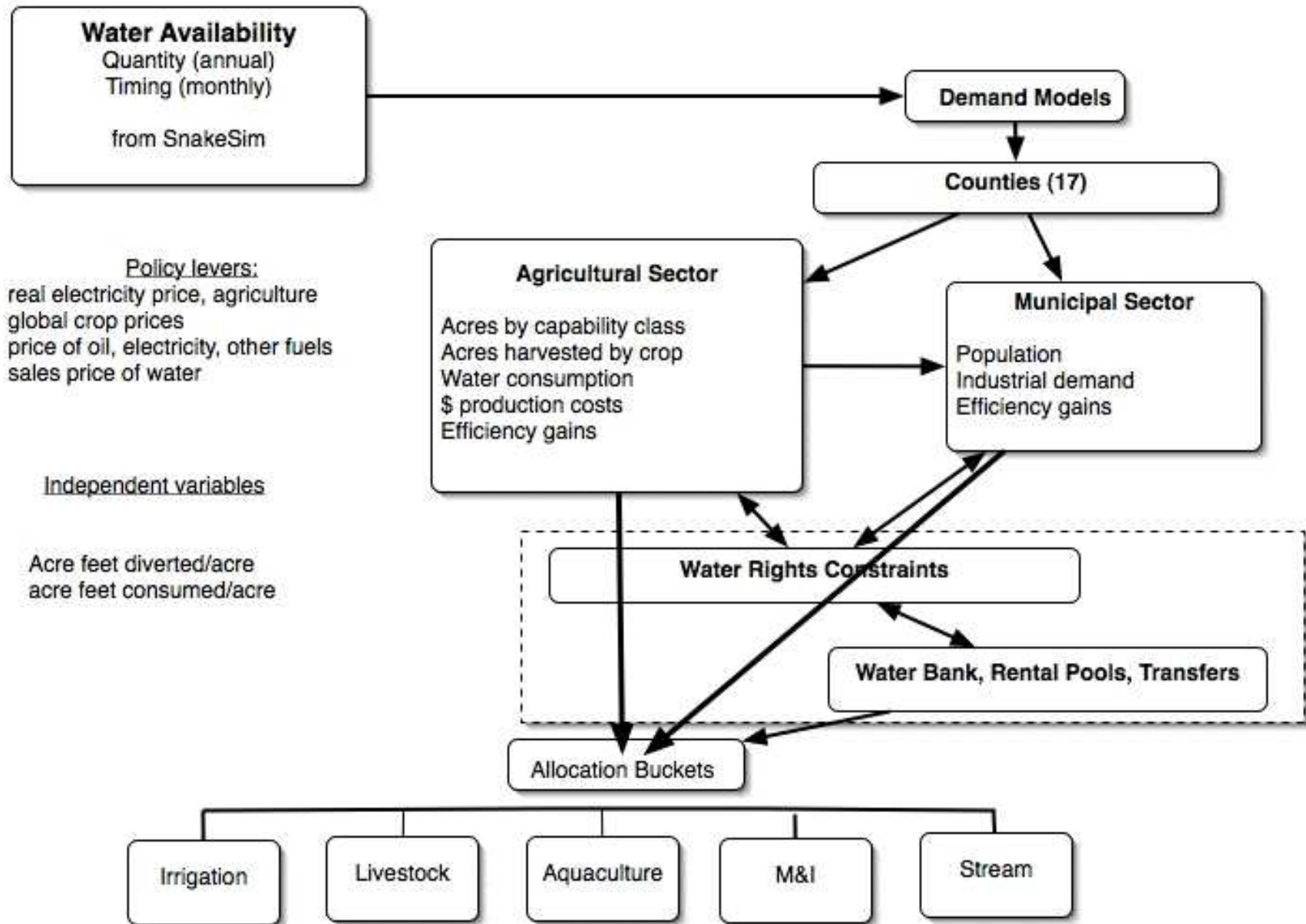
- Aquifer Boundary
- - - County Boundary
- Bonneville-Jefferson Ground Water District
- North Snake Ground Water District
- Madison County Ground Water District
- Magic Valley Ground Water District
- Aberdeen-American Falls Ground Water District
- Bingham Ground Water District



Source: IDWR data

Conceptual design

UPPER SNAKE MODEL



Policy levers:
real electricity price, agriculture
global crop prices
price of oil, electricity, other fuels
sales price of water

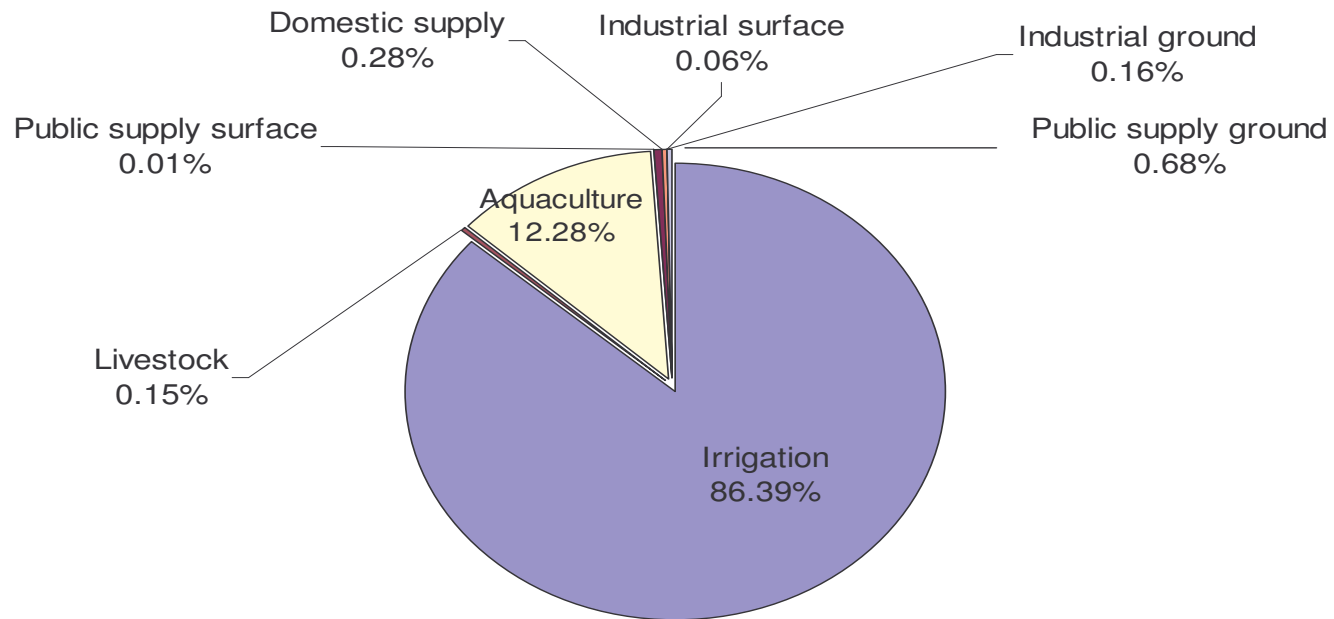
Independent variables

Acres diverted/acre
acre feet consumed/acre

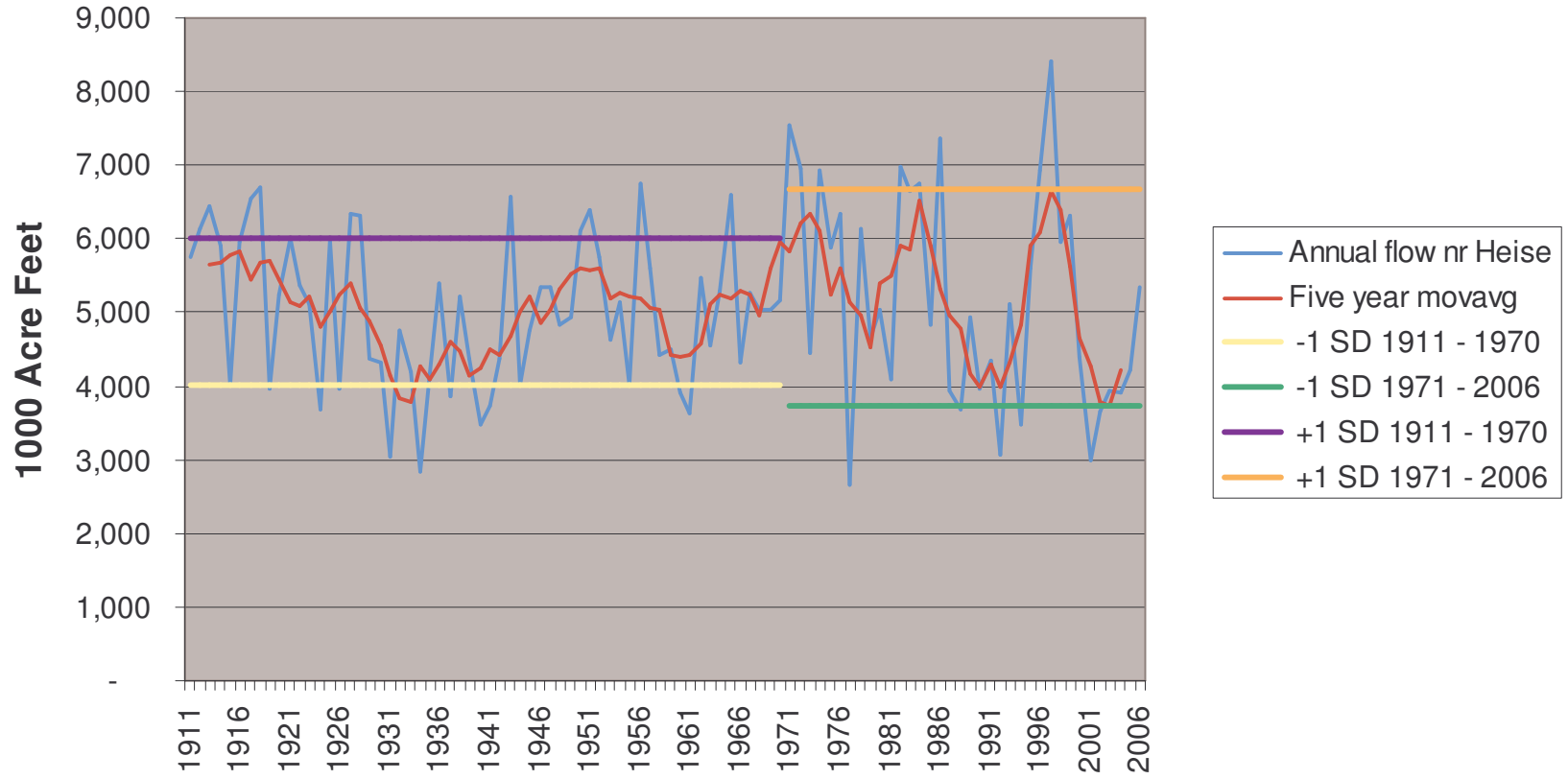
 Modeled indirectly

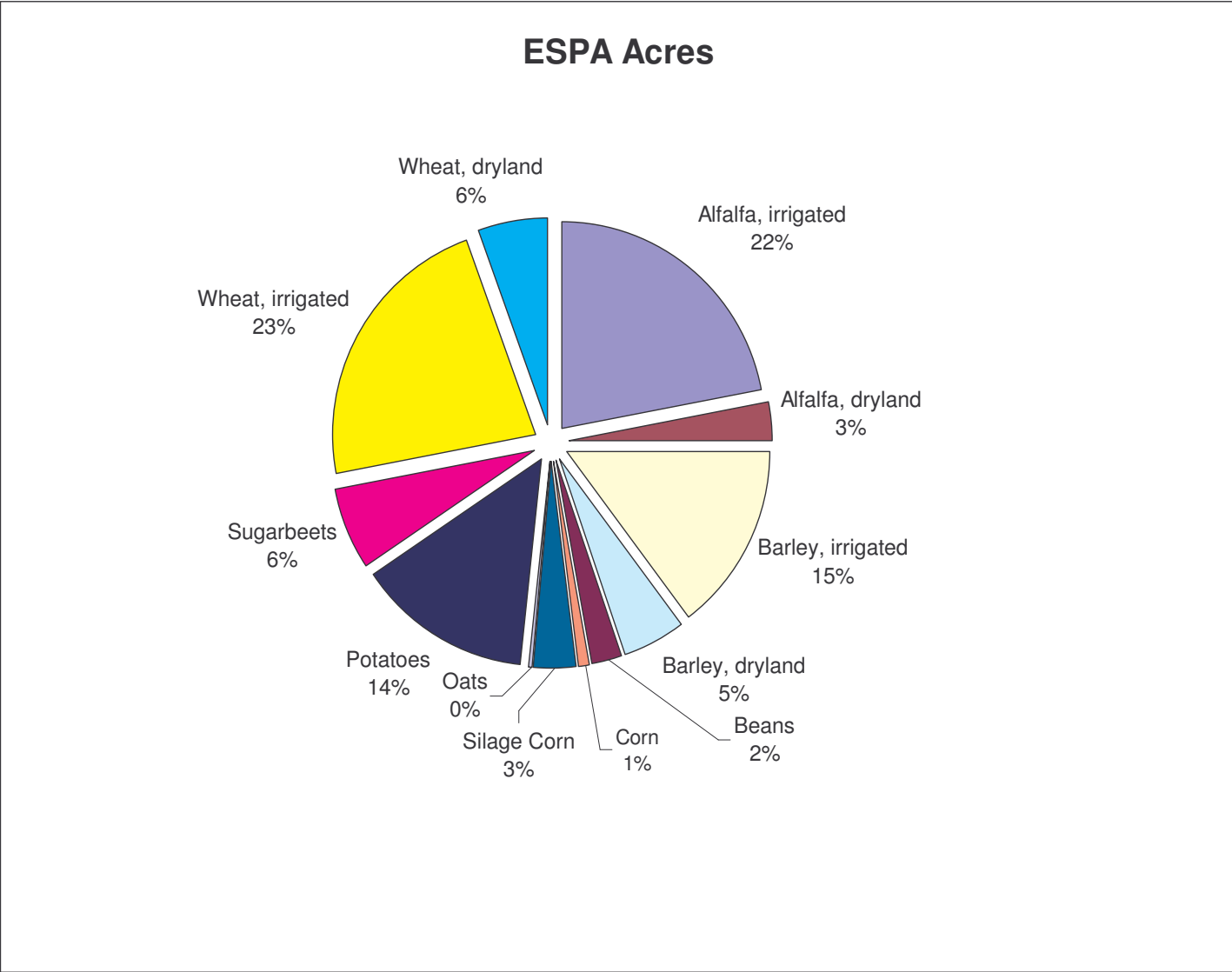
Water history

Total Water Withdrawals - withdrawals by use



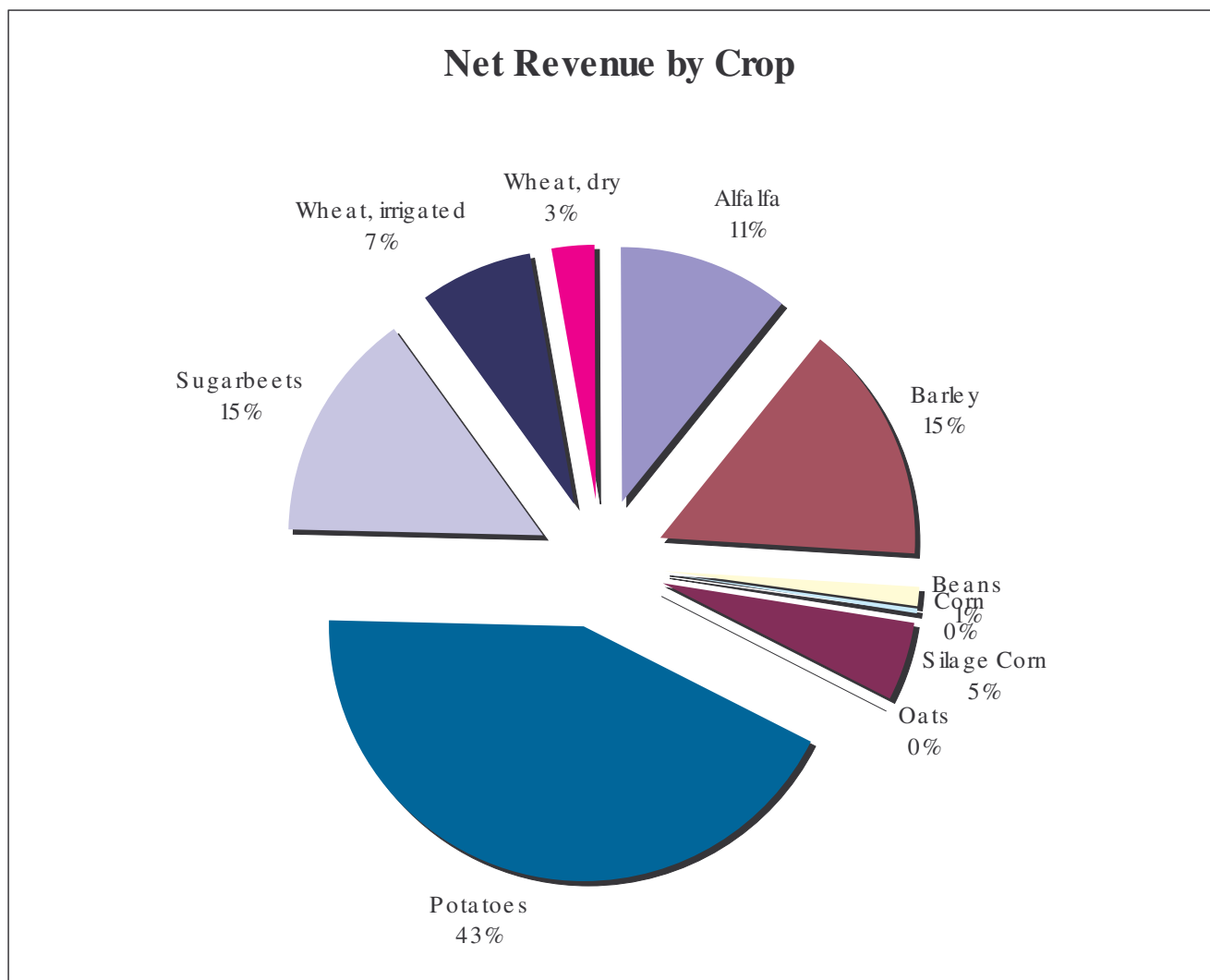
Snake River Natural Flow nr Heise 1911 - 2006





Potatoes and Sugarbeets account for only 20% of acreage.

Potatoes account for the largest share of net revenues



Simulation results

Assumptions*

Variable	Base	Current Climate	Additional CC	Forecast, no CC	Forecast, current CC
Water at Heise	95 year average	1 SD reduction from 95 year average	CC 1 SD from 1971 - 2006 average	95 year average	1 SD reduction from 95 year average
Input prices	Current values	Current values	Current values	10% increase per decade	10% increase per decade
Commodity prices	Current values	Current values	Current values	Current values	Current values
Dairy cows	Current stock	Current stock	Current stock	10% increase per decade	10% increase per decade
Water efficiency	No change	5% public; 1% industrial; 2.5% irrigation improvement per decade	5% public; 1% industrial; 2.5% irrigation improvement per decade	5% public; 1% industrial; 2.5% irrigation improvement per decade	5% public; 1% industrial; 2.5% irrigation improvement per decade
Water budget (for ET)	No change	No change	No change	No change	No change
Population	No change	No change	No change	Idaho Power Co. forecast (50% over 40 years; some counties decline)	Idaho Power Co. forecast (50% over 40 years; some counties decline)

*The water assumption explores the effect of prolonged drought periods at the level indicated, not a reduction of the average flows to that level.

Acreage and water change from base

	Base	CC 1 SD from 1911- 2006 average only	%	CC 1 SD 1971 - 2006 average only	%	Forecast, no CC	%	CC 1 SD from 1911- 2006 average, Forecast	%
Acreage									
Irrigated	2,167,655	(152,981)	7.1%	(212,130)	9.8%	272,070	12.6%	99,331	4.6%
Non-irrigated	326,613	34,935	10.7%	52,130	16.0%	(13,336)	4.1%	23,685	7.3%
Total	2,494,268	(118,046)	4.7%	(160,000)	6.4%	258,734	10.4%	123,016	4.9%
Water allocation (KAF)									
Irrigation, Lvstk	13,302	-1,936	14.6%	-2,194	16.5%	1,713	12.9%	-486	3.7%
Municipal	106	-16	14.9%	-16	15.5%	105	98.8%	73	68.7%
Aquaculture	1,887	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Domestic	43	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Industrial	33	-4	13.3%	-5	15.7%	38	113.8%	29	87.4%
Total Withdrawals (KAF)		-1,956	-12.7%	-2,216	-14.4%	1,855	12.1%	-384	-2.5%

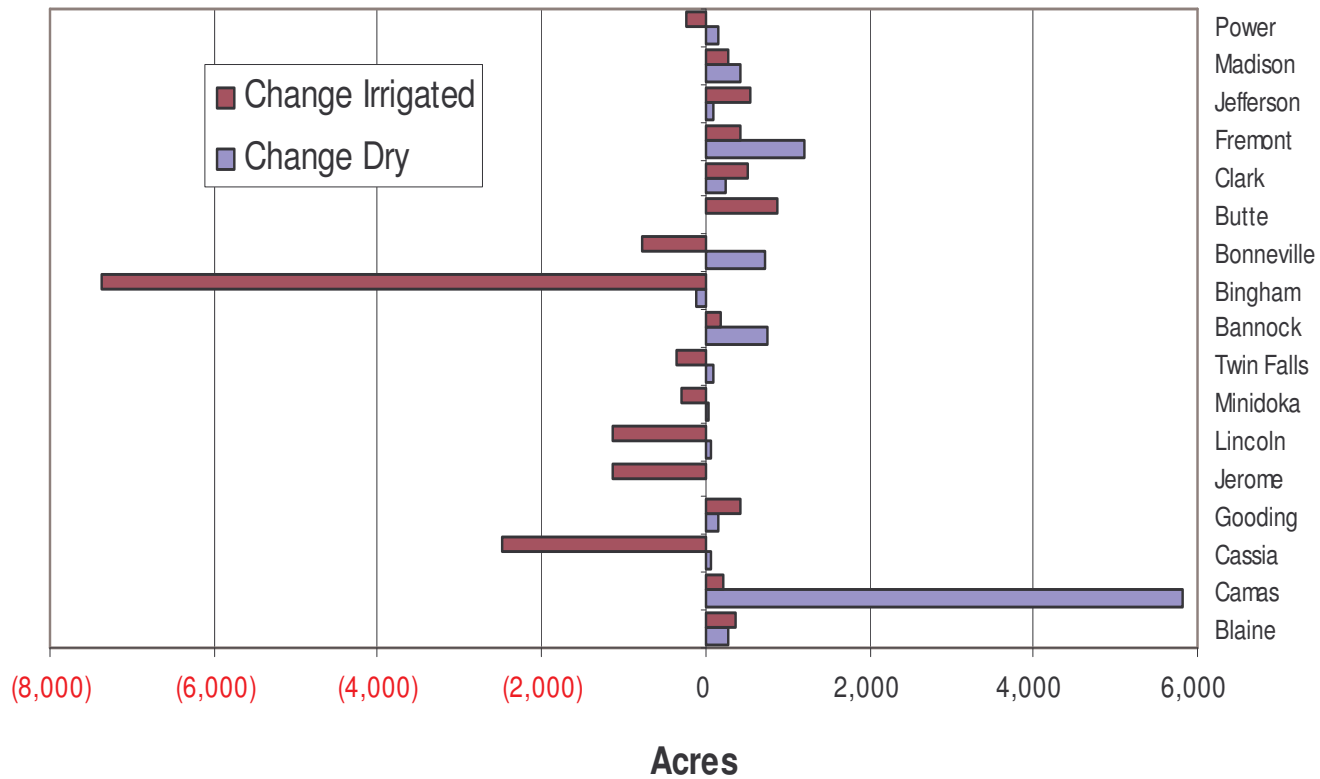
Cumulative % Change Net Revenue per acre

By Crop	2000 Base	CC 1 SD from 1911-2006 average only	CC 1 SD from 1971 - 2006 average only	Reasonable Forecast, no CC	CC 1 SD from 1911-2006 average, Forecast
Alfalfa	\$69	4.6%	6.7%	34.8%	38.9%
Barley	\$135	11.9%	17.5%	24.8%	34.8%
Beans	\$91	0.1%	0.2%	29.5%	29.4%
Corn	\$49	0.2%	0.2%	111.1%	111.0%
Silage Corn	\$171	0.3%	0.4%	27.1%	26.8%
Oats	(\$81)	0.2%	0.3%	32.0%	32.2%
Potatoes	\$537	0.2%	0.3%	21.8%	22.0%
Sugarbeets	\$410	0.1%	0.1%	17.6%	17.6%
Irrigated Wheat	\$62	2.3%	3.3%	79.8%	81.7%
Dryland Wheat	(\$103)	0.2%	0.3%	36.8%	36.6%

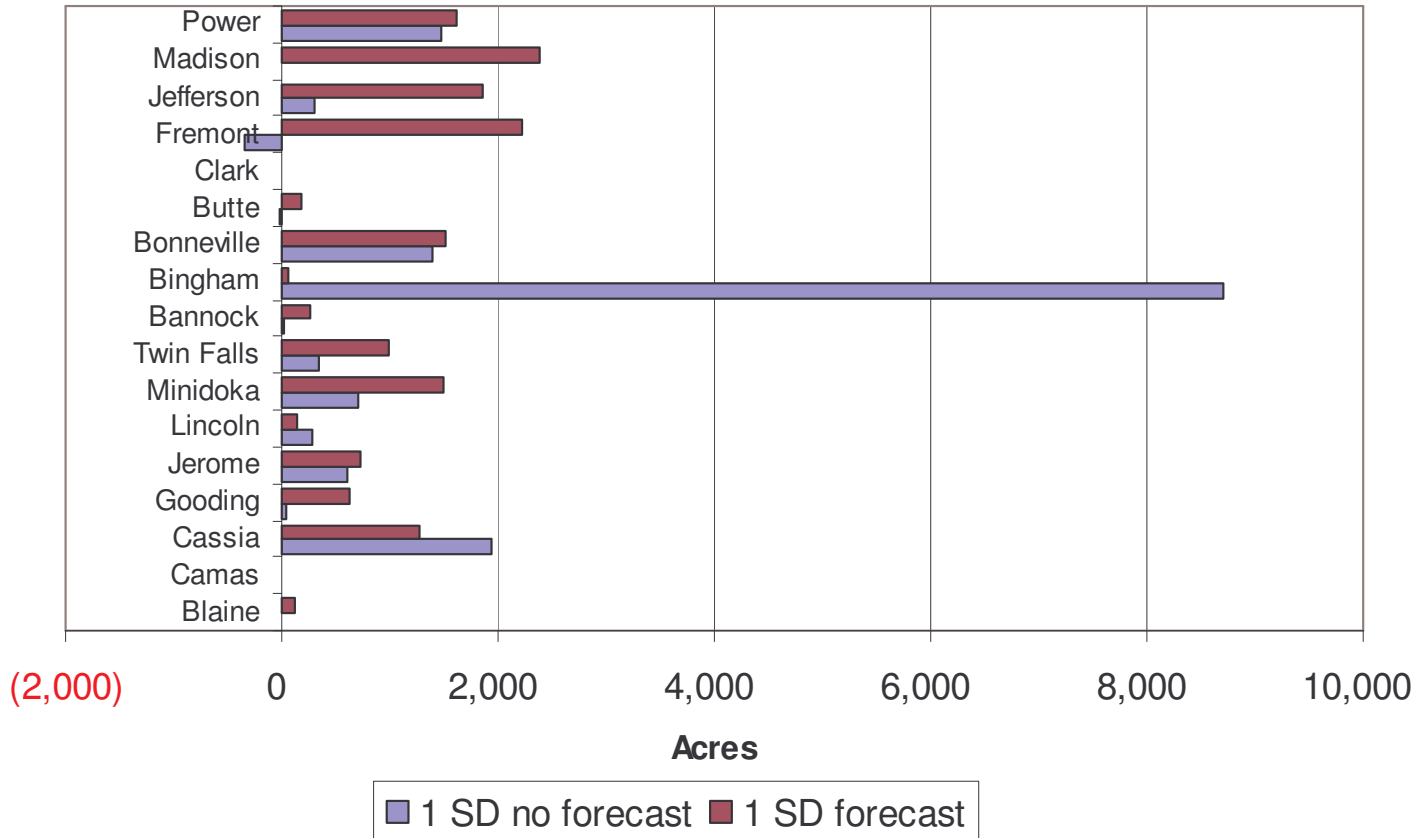
Non-agricultural employment (crop weighted)

County	2000 Base	CC 1 SD from 1911-2006 average only	CC 1.5 SD 1971 - 2006 average only	Reasonable Forecast, no CC	CC 1 SD from 1911-2006 average, Forecast
Blaine	19,830	3.1%	3.1%	11.7%	6.1%
Camas	511	16.7%	25.2%	5.6%	22.4%
Cassia	10,865	10.4%	14.1%	20.3%	8.3%
Gooding	6,033	0.8%	1.1%	74.7%	72.6%
Jerome	8,621	9.2%	12.5%	54.3%	41.5%
Lincoln	1,711	10.7%	14.2%	41.4%	27.5%
Minidoka	8,403	4.7%	5.4%	8.1%	1.4%
Twin Falls	40,972	7.1%	9.2%	32.3%	22.9%
Bannock	44,537	2.9%	5.0%	8.1%	5.7%
Bingham	18,300	22.8%	31.3%	23.7%	0.5%
Bonneville	57,405	8.7%	10.9%	13.3%	2.1%
Butte	5,021	2.8%	3.5%	6.0%	1.4%
Clark	668	1.6%	2.7%	3.8%	2.7%
Fremont	4,272	7.2%	13.0%	0.2%	4.8%
Jefferson	7,930	2.8%	3.0%	9.8%	5.3%
Madison	15,916	2.6%	2.3%	0.0%	5.0%
Power	3,654	6.8%	9.2%	6.5%	12.8%
Total	254,649	5.7%	6.6%	14.7%	7.2%

Change in Alfalfa Acres: 1 SD from 95 year average



Potatoes Change in Acres 1 SD from 96 Year Average



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