EXPANDED NATURAL RESOURCES INTERIM COMMITTEE MEETING
April 9, 2004
9:00 a.m. to 4:00 p.m. East Conference Room
J.R. Williams Building, 700 West State Street, Boise, Idaho

The meeting was called to order by Cochairman Senator Laird Noh at 9:00 a.m. Other committee members present were Senator Robert Geddes, Senator Don Burtenshaw, Senator Stanley Williams, Senator Dean Cameron, Senator Joe Stegner, Senator Skip Brandt, Senator Clint Stennett, Cochairman Dell Raybould, Representative Bert Stevenson, Representative JoAn Wood, Representative Mike Moyle, Representative Scott Bedke, Representative George Eskridge, Representative Jack Barraclough and Representative Charles Cuddy. Ad hoc members present were Senator Bert Marley, Senator Gary Schroeder, Senator John Andreason, Senator Tom Gannon, Representative Darrell Bolz, Representative Maxine Bell, Representative Tim Ridinger, Representative Doug Jones, Representative Wayne Meyer, Representative Wendy Jaquet, Representative Larry Bradford, Representative Lawerence Denney. Senator Brent Hill and Senator Shawn Keough were absent and excused. Non committee member legislators present included: Speaker Bruce Newcomb, Senator Cecil Ingram, Representative Sharon Block, Representative Frances Field and Representative David Langhorst. Staff members present were Katharine Gerrity and Toni Hobbs.

Others present included Joe Jordan, Idaho Water Resources Board (IWRB); Hal Anderson, Idaho Department of Water Resources and IWRB; Tom Stroschein, Latah County Commissioner; Les MacDonald, City of Moscow; Kay Hardy, Dan Steenson and Gregory Kasko, Clear Lakes Trout Co.; Rich Rigby, Bureau of Reclamation; Cindy Robertson and Scott Grunder, Idaho Department of Fish and Game; Thomas Grant, Idaho Department of Water Resources; Larry W. Cope, Randy MacMillan, John Simpson and Patrick Sullivan, Clear Springs Foods, Inc.; Charles Coiner, Twin Falls Canal Co. - Committee of 9; Ted Whiteman, Jerome Cheese Company; Neal Powell, Bingham Ground Water District; John Rosholt, Twin Falls Canal Company - North Snake Canal Company - American Falls Recharge District; Albert Lockwood, Northside Canal Co. - Committee of 9; Craig Bledsoe, Department of Labor; Gayle Batt, Idaho Water Users Association; Lewis Rounds, Idaho Department of Water Resources - Water District 120; Tom Geary, Idaho Farm Bureau; Bert Bowler, Idaho Rivers United; Don Hale, Committee of 9/Shelley to American Falls; Donna Pence, City of Gooding; Jamie Gough, U.S. Forest Service; Richard Slaughter and Don Reading, University of Washington Climate Group; Steven Balster, Anheuser-Busch; Jeff Fereday, Anheuser-Busch and Idaho Ground Water Appropriators; Suzanne Budge-Schaefer, SBS Associates LLC; Ton Van Orden and Craig Evans, Bingham Ground Water District; Bruce Wright, Basic American Foods; Lynn Tominaga

and Chuck Brendecke, Idaho Ground Water Appropriators; Jim Tucker, IPC; Gary Johnson, Idaho Water Resources Research Institute; Ron Carlson, Idaho Department of Water Resources/Water District 1; Ray Houston, Legislative Services Budget and Policy; Jessica Wilcox, Bonneville Power Administration; Carl Bianchi, Mike Nugent, Caralee Lambert and Maureen Ingram, Legislative Services Research and Legislation; James Yost, Governor's Office; Lance Bates and Jackie Wakefield, City of Twin Falls; Bill Sedivy, Idaho Rivers United; Barry Burnell, Idaho Department of Environmental Quality; Vic Conrad, J.R. Simplot Company; Jo Beeman, Water Resources Coalition; Gary and Helen DeMoss; Tim Corder, Mtn. Home Ground Water Advisory Board; Mark Duffin, Idaho Sugarbeet Growers Association; Bill Jones, Jones Trout; Lynn Babington, Thousand Springs Reach Advisory Group; Craig Patterson, Carey Water and Sewer District (Municipal); Jason Miciak, Attorney/SeaPac/Pristine Springs/Bill Jones; Christian Petrich, SPF Water Engineering; Scott Rhead, United Water; Jerrold Gregg, U.S. Bureau of Reclamation; J. Dee May, Rangen Inc.; J. Brent Olmstead, Milk Producers of Idaho; Don Aardema, Milk Producers of Idaho and North Snake Ground Water District; Karl Dreher, Phil Rassier and Dave Tuthill, Idaho Department of Water Resources; Andrea Mihm, Sullivan and Reberger; Stan Clark; Michael Creamer, Brenda Tominaga, Randy Budge and Tim Deeg, Idaho Ground Water Appropriators; Clive Strong, Idaho Attorney General's Office; Michael Bogert, Governor's Office; Jay Engstrom, Idaho Department of Commerce; Dale Rockwood, Larry Kerbs and Paul Berggren, Committee of Nine; Ray Rigby, Attorney/Upper Valley Committee of Nine; Norm Semanko, Idaho Water Users Association; Chuck Brockway, Brockway Engineering; Mary Lucachick, Idaho Department of Parks and Recreation; Roger Ling, A & B Irrigation District; Bob Naerbout, Idaho Dairymens Association; Orlo Maughan, Dean Stevenson and David Suchan, Magic Valley Ground Water District; Mike Faulkner and Jeff Martin, North Snake Ground Water District; Linda Lemmon, Idaho Aquaculture Association; Gary Lemmon, Blind Canyon Aquaranch/ Thousand Springs Water Users/ Big Springs Water Users and Ron Abramovich, NRCS Snow Survey.

Senator Noh explained the goal of the meeting was to build the information base for those legislators and others who have not spent a lot of time dealing with the intricacies of ground and surface water management. He explained that the immediate crisis is on the Eastern Snake Plain Aquifer but that is not the only part of the state facing water difficulties. Another goal for this meeting is to organize working groups and staff assistance for each of the five areas of the state facing these water issues. He emphasized how important it is that everyone is aware of the urgency of the work that is to be done. Each working group will be expected to have regular meetings and will be required to report back to the main committee at each monthly meeting with their progress.

Representative Raybould commented that, as cochairs of the committee, he and **Senator Noh** appreciate all of the work that has been done so far and he hopes that all of the interested parties will provide input that will help the committee to meet its goals. Many things need to be discussed and resolved. **Senator Noh** added that due to the budget constraints and the limited time available to solve the problem, limits had to be placed on what would be covered. The decision was made to limit the discussions to the ground water problems of the state. A copy of the agreement that led to the one year reprieve and the formation of the interim committee is

available at http://www.idwr.state.id.us/Committee/Agreement.pdf.

Michael Bogert, Office of the Governor, stated that the Governor's message to those present today is that the legislature and the executive branch are offering their full attention, dedication and resources to this issue. When the Governor signed this legislation, it was very clear that this was a beginning. It also represents a triumph of the state's willingness to negotiate together with others who have so much at stake in this issue. This is a process that has all of the elements necessary to succeed simply because the people of Idaho have decided to come together to dedicate the variables that are at their disposal to resolve this issue.

Mr. Bogert introduced Jay Engstrom from the Department of Commerce. **Mr. Engstrom** is the point person for the Department of Commerce's part in this process. He also introduced **Karl Dreher, Director of the Idaho Department of Water Resources.**

President Pro Tem Senator Robert Geddes was introduced to give some background information on the Bear River area and the problems they are facing regarding ground water use. **Senator Geddes** stated that his background in geology allowed him to learn about the dynamics of water and how those systems work.

Senator Geddes said that the history of water in Idaho really started in the community of Franklin. In the 1860's, Franklin was the first settlement in Idaho and that is when water began to be diverted from the Cub River system and the Worm Creek system for irrigation. In 1877, Congress passed the Desert Land Act which permitted heads of families to take possession of more land. By that time, most of the rivers and streams along the Bruneau, Boise, Payette, Owyhee and Weiser rivers had irrigated farm land. In the early 1870's, ranching and farming had started in the Upper Snake River Valley. In 1880 the first filings on the Snake River were entered into by the Eagle Rock and Willow Creek Irrigation Companies. The Idaho Territorial Legislature, in 1881, entitled a person to file notice on a stream at a point of diversion and then record his claim, much like a miner would, at the county courthouse. At this point in time, one can assume water became a contentious issue for the state. The earliest projects were cooperatively developed in southeastern Idaho by farmers at relatively low costs. By 1885, twenty-five canals had been dug in that area and by 1906 there were 264 canals. These were locally operated cooperative canal systems built by farmers. By 1900, 76 canals totaling 568 miles of main and lateral ditches served the Lower Snake River Valley and provided the lifeblood for almost a quarter of the total valley acreage of 400,000 acres. Without these projects the entire Lower Snake area would have remained desert providing only scanty feed for cattle and sheep.

Due to the fact that previous land laws had failed to facilitate the settlement of arid agricultural land, Congress passed the Carey Act in 1894. The government would cede up to 1 million acres to any willing state to undertake reclamation and development of land under the grant. The land could then be sold into parcels as small as 40 acres. The state and private investors had ten years to complete a project after beginning construction. The construction company sold water rights and the state could sell the land for as much as fifty cents an acre. Idaho took advantage of these

provisions and one of the projects became the nation's showplace for the success of the Carey Act.

Ira B. Perrine was one of the people that took advantage of the Carey Act. He developed the first dairy in the state to provide milk, butter and meat to the miners. In the fall of 1884 he moved his dairy herd south to the Snake River Canyon for the winter. Here he found what came to be known as Blue Lakes. After succeeding with irrigation in this area, in 1900 he was ready to water 500,000 acres of land by taking water out of the Snake River at a point known as the Cedars which is the site of Milner Dam. He began raising money to fashion an agricultural empire. He received $30,000 from Stanley Milner and incorporated the Twin Falls Land and Water Company. He secured money from a Chicago bonding house and filed notice for the diversion of water on both the north and south sides of the Snake River, contracted with Idaho and developed 270,000 acres under the Carey Act. He began to sell land at twenty-five cents an acre and water from $25.00 per acre. Even then water was worth 100 times more than the land. This led to the development of the City of Twin Falls as well as many smaller communities. The project included 244,000 acres watered by gravity flow of the Snake River to 1,295 farms. It was described as "one of the miracles of modern agriculture" by one writer.

In 1914 and 1915 what became known as the Bureau of Reclamation stored water in Jackson Lake to be used later to supplement irrigation in the Magic Valley. Numerous other projects were completed including the American Falls Dam, the Arrowrock Dam, the Anderson Ranch and Lucky Peak Dams, Pallisades and Dworshak Dams.

During the last 45 years, few projects of any magnitude have been completed. The state has simply depended and benefitted from the work of our forefathers. Water has proven itself to be one of Idaho's most valuable resources.

Senator Geddes agreed with **Senator Noh** that this effort will be monumental and significant. It will change the history of the State of Idaho. In his opinion, this effort will prove that conjunctive water management (where surface water has to be managed in concert with ground water) will be the way of the future.

Speaker of the House of Representatives Bruce Newcomb explained that his father had always told him that someday water would be worth more than gold. It seems that the state has reached that point. Water resources in Idaho are finite and this process should have been started 20 years ago when the Swan Falls conflict with Idaho Power was happening. Idaho is at the point were all future growth, agricultural, municipal, residential and so on, is all going to depend on how water is managed in the future. The way we look at water is going to have to change because we are depleting our water resource faster than we are replacing it. Without change, water will be so costly no one will be able to afford to divert it for any use. One of the challenges will be how to balance the use of water with the natural resource that occurs on an annual basis. He explained that the remedies for short water years are harsh and involve curtailment and shutting down junior water users. The growth of the City of Twin Falls will be limited by how much water they have as will the Treasure Valley and Ada County. If the Nez

Perce claim were to prevail, Ada County, the City of Boise, would lose 60% of its water. Everyone that uses water for any purpose has a lot at stake.

Representative Newcomb added that this is a big task. He thanked everyone involved in reaching the interim agreement for working together to allow the state to try to find a resolution to the issue that is acceptable to everyone. If an agreement is not reached, the next step will be a courtroom. There will never be another chance to solve this issue in this manner.

Karl Dreher, Director of the Department of Water Resources was introduced to speak to the committee regarding water supply and management issues. His presentation is available at http://www.idwr.state.id.us/Committee/default.htm. **Director Dreher** noted that the intent of his presentation is to help everyone understand the range of differences that exist in aquifers. Even though his discussion is limited to a few aquifers of significance, there are local areas all across the state that are experiencing conflicts and problems involving ground water use. He explained that Idaho is dependent on ground water for 95% of the domestic, commercial, industrial and municipal needs. That is the highest reliance of any state in the country.

Director Dreher defined "hydraulically connected" surface water and ground water to mean that a portion of the surface water can become ground water or vice versa. For example, the Snake River, at certain locations, is connected to the aquifer. At those locations, the Snake River can lose water to the aquifer or it can gain water from the aquifer. In some cases if the water table is far enough below a stream, no matter what happens to the ground water aquifer beneath the stream, it will not affect stream flows.

Director Dreher stated that the bulk of his remarks will focus on the Eastern Snake Plain Aquifer due to the fact that it is a unique aquifer in the United States and maybe North America. It is more than 10,000 square miles in extent and includes most of the prime agricultural area in Idaho. It is comprised primarily of fractured basalt and has a very high degree of hydraulic conductivity. This means that it can readily take water and can readily convey water from many sources.

The health of the aquifer is not necessarily easy to measure. In a model used comparing ground water levels in the spring of 1980 to ground water levels in the spring of 2002, there have been some moderate declines in portions of the aquifer of from five to ten feet. This is not that significant over a 22 year period. There are some exceptions with declines of 20 or 25 feet that could be significant. However, more recently ground water levels have not been as stable. This is largely because of the drought. The last year these mass measurements were made was in 2002 and most of the declines included in the 1980 to 2002 model occurred between 2001 and 2002. The Arco area showed declines of 20 feet or more in one year and in the Gooding area declines of 30 feet or more have occurred.
Spring discharges have not been stable. Graph "A," as attached hereto, shows estimated cumulative spring discharge in the Thousand Springs reach of the Snake River. The graph was prepared by the U.S. Geological Survey (USGS) by measuring certain springs continuously and measuring all spring discharges at one time during the year to come up with the estimates.

Director Dreher stated this measurement is reasonable in terms of overall discharge.

In the early 1900s the average spring discharge was about 4200 cfs and during decades of surface water irrigation, spring discharge increased to almost 7,000 cfs in the 1950s. Since that time it has been declining.

The increase from the 1900s to the 1950s was due to surface water irrigation. In the early 1900s very large amounts of surface water were diverted that were many times in excess of what the consumptive crop needs were. This excess water went into the aquifer and this is what the USGS estimates raised the ground water levels by as much as 60 feet. Sixty feet across an area of more than 10,000 square miles is a huge amount of water.

Director Dreher noted that it was during this time in the 1950s and 1960s that Idaho's aquaculture industry began to develop. This industry took off and established valid water rights from a supply that at least partially only existed because of surface water irrigation. Also during this time period, technological advances were made in the ability to construct deep wells. Technological advances with sprinkler systems were also occurring and many farmers were converting from flood irrigation using surface water to sprinkler irrigation using surface water. Less and less water was being diverted and there was no longer the large amount of excess water that became incidental recharge to the aquifer by seeping back into it. While there have been significant declines in some cases, the average annual discharge through the springs today is still about 1,200 cfs above where it would have been in 1900 without surface water irrigation.

Director Dreher discussed graph "B," as attached hereto, relating to Box Canyon Springs. Box Canyon Springs is one of the springs that is measured continuously by the USGS. Since 1951, near the time when the aquifer was at its peak, average spring flows have declined from about 400 cfs to about 325 cfs.

Director Dreher noted, as represented in graph "C," as attached hereto, not all springs are created equal. The spring that forms the source for Billingsley Creek has decreased from an average flow of 50 cfs in the 1950s down to 20 cfs or even less. One reason the Billingsley Creek flows have responded in this manner is that they are higher elevation springs that are much more sensitive to changes in ground and surface water as well as the pronounced effects of drought.

However, drought is not the only factor. Loss of incidental recharge because of the surface water improvements in terms of applications through sprinkler systems and improvements that reduce leakage from conveyance systems and other activities are also factors. When these depletions are
superimposed with a reduced supply due to drought, there is the potential for problems and for injury to senior priority rights.

Director Dreher noted that the last four years have been the worst drought years in a row on record for the state. Graph "D," as attached hereto, shows natural flows of the Snake River near

Heise dating back to 1911 with a moving average of the last three years superimposed onto it. This shows that we now have dropped below the prior low of record in the 1930s. Individual years in the 1930s were worse than what we have been experiencing but not back to back years.

Director Dreher presented graph "E," as attached hereto, depicting the water budget that was prepared as part of reformulation and recalibration of the ground water model over the calibration period. The information represents an average for the period of time from 1982 through 2002.

Director Dreher explained that precipitation, because of the size of the aquifer, results in a significant amount of water. The net surface water diversions minus irrigated evapotranspiration is the actual amount on an average annual basis that went into the aquifer. From this example that is about 1.5 million acre feet on an average annual basis between 1982 and 2002 that went into the aquifer as incidental recharge because of surface water irrigation. That is less than the amount that went into the aquifer from precipitation. This number used to be larger.

One generalization made is that flow direction matters. **Director Dreher** clarified that direction makes no difference. The elevation of the ground water in the aquifer is what matters. The significance of a particular well is not a function of flow direction, it is a function of location and time. Over the middle part of the aquifer, the water levels are relatively flat. There are two significant geological features that have an effect in terms of where ground water withdrawals affect the surface water source. Those features include the Mud Lake Divide and the Great Rift. These both have low permeability in comparison to the fractured basalt of the aquifer and water has a hard time getting through to the aquifer. This means that ground water withdrawals above the Mud Lake Divide are not going to significantly affect Thousand Springs, but they will affect the upper reaches of the Snake River. The ground water withdrawals that have the largest affect on Thousand Springs are below the Great Rift in the North Snake Ground Water District and the Magic Valley Ground Water District. The converse is also true. Incidental recharge or otherwise below the Great Rift will have the largest affect on Thousand Springs.

When ground water is withdrawn, it causes a depletion to a connected source but it takes many years for the full effect of those depletions to be recognized at the connected source. In the context of Thousand Springs in terms of when aquaculture was developed in the 1960s, the effects of ground water depletions that occurred are still being seen. This complicates water management greatly. This is the same thing regarding a well being turned off. Depletions increase for a period of time after the well has been turned off.

Director Dreher explained that these depletions are a factor currently being considered in transfers of ground water rights from different locations on the Eastern Snake Plain. There is a moratorium in place in that area for new ground water development. Development that is being allowed in this area is very limited. The only new development being allowed is when depletions are mitigated one for one.

Director Dreher went on to note that there are transfers occurring. In this case, someone buys

an existing ground water right, files an application for transfer, and typically move the point of diversion, the place of use and often changes the nature of use. The most common transfers recently have been to change the nature of use from irrigated agriculture to a commercial use such as a dairy. In this situation, the part of the water right that is moved for the dairy includes an associated amount of irrigated lands that are dried up and the consumptive use associated with the irrigation is transferred to a new location for use by the dairy with the point of diversion also being moved. In order to comply with Section 42-222, Idaho Code, the transfer must not cause any additional depletion.

Director Dreher explained that additional depletion is caused by a combination of the depletion caused by the original well and the new well. If additional depletion is caused, the Idaho Department of Water Resources requires mitigation. Mitigation, in most cases, is done by reducing the quantity of water diverted under the right at the new place of use. This is somewhat controversial, especially in the farther eastern portions of the aquifer because people believe the right is being reduced. This is not true. The quantity of water they can divert under the right is being reduced in order to make things status quo and prevent injury to other existing rights. Water that is not diverted under the right is not forfeited because full beneficial use is still occurring. There is, however, another reach of the river that benefits from the reduction of use and transfer.

Director Dreher commented that one of the things we need to look at, at some point, is whether or not it is appropriated to develop a system of mitigation credits whereby these increases to a reach of the river resulting from a transfer could be sold or exchanged or used in some manner to offset depletion caused by another transfer.

Director Dreher continued with a description of the Rathdrum Prairie Aquifer. This aquifer is very different than that of the Eastern Snake Plain Aquifer. The Rathdrum Prairie Aquifer was caused by the last ice age and is located within Idaho and Washington. Geologists estimate that the maximum flood discharge from these events was as high as 750 million cfs which is twenty times the combined flow of all of the rivers in the world today. The hydrological connection does not happen in Idaho, but in Washington. Whenever Washington has a problem meeting required stream flows, they blame Idaho depletions on the reduced flows in the Spokane and Little Spokane rivers.

According to **Director Dreher**, long term, the ground water level in this area is very erratic. A hydrograph of the monitoring well located west of Lake Coeur d'Alene shows highly variable water levels without a clear trend up or down. Removing the variation shows that it is actually a very stable situation. The dominant factor affecting these ground water levels is precipitation. The future availability for use is going to be dependent on rainfall. It is not known how much unappropriated water exists in the aquifer system at this point or how ground water withdrawls in Idaho affect flows in the Spokane River. To address this problem, Idaho has entered into a memorandum of agreement with the USGS and the State of Washington to begin a collaborative study. This study has an initial federal appropriation of $500,000.

The Moscow-Pullman Aquifer has an upper (Wanapum) and lower (Grande Ronde) section and is also located partially in the State of Washington. The Wanapum section is more shallow than the Grande Ronde. On the Idaho side there is a sedimentary formation known as the Latah formation. At this point, it is believed that this formation has some effect on how ground water withdrawals in Idaho affect the aquifer system.

The Wanapum Aquifer declined under the city of Moscow until the 1960s when the city built deeper wells in the Grande Ronde system. The city now draws about 30% of its water from the Wanapum system and water levels have now recovered to 1940 levels.

The current understanding of this system is that recharge to the Wanapum Aquifer is from precipitation and stream losses while recharge to the Grande Ronde system is primarily from downward leakage from the Wanapum. Groundwater withdrawals to the Grande Ronde have stabilized somewhat in Idaho and water levels appear to be approaching stable, though lower levels.

Director Dreher noted that there is an effective water management group known as the Interstate Palouse Basin Aquifer Committee (PBAC) that was formed in the 1990s that operates in the area.

Director Dreher commented that the Treasure Valley Aquifer has been an area where the Idaho Department of Water Resources has been trying to gain an increased level of understanding. The Treasure Valley Hydrologic Project has recently been completed. A significant participant in that project was the Idaho Water Resource Research Institute. The Treasure Valley Aquifer has an added component of geothermal water that does not exist in the other aquifers.

Over one-third (37%) of the land in the Treasure Valley is under flood irrigation. This is significant because virtually all of the recharge for the aquifer other than precipitation and canal seepage occurs from surface water irrigation.

According to **Director Dreher**, the current understanding of the Treasure Valley Aquifer includes:

- Ground water withdrawals impact availability of water in surface water sources.
- Significant declines in water levels have occurred in Southeast Boise and south of Lake Lowell.
- Moderate declines, generally less than 10 feet, have occurred between Eagle, Kuna, and West Boise.
- Approximately 1,000,000 acre feet discharges annually from the western portion of the aquifer to surface water sources below the City of Star. This water is unappropriated.
- Water in the eastern and central portions of the valley not available when needed, could be addressed with additional storage, including aquifer storage and recovery.

The Mountain Home Aquifer has shown significant declines in ground water levels. They are

struggling to solve the problems but are reaching the point where reduced usage or curtailment will have to take place. Water usage currently is exceeding the average annual rate of recharge by 30,000 acre feet per year. Recharge to this area is limited.

Director Dreher noted that, unlike the previous aquifer systems that have been discussed, the Bear River Basin Aquifer system is essentially alluvial and is associated with the streams in the area. An alluvial system is one caused by and associated with the river. Hydrographs of wells in the area show that ground water levels are somewhat stable.

According to **Director Dreher**, the problem is that alluvial aquifers are directly connected to the river and when ground water is withdrawn, it either takes water out of the river or it reduces the reach gains that accrue to the river. This has ramifications to people that have natural flow water rights in the Bear River system. These natural flow water rights are supplemented to a large degree with storage in Bear Lake. Storage in Bear Lake is at an all time low and it is essentially empty. There is not going to be enough surface water for irrigation this season. This will probably result in curtailment of surface water diversions in Idaho in 2004 and possibly in the future. Part of this will be to help supply prior water rights of people in Utah. Idaho has an interstate compact with Utah and Wyoming. There are provisions in the compact for allocation of water during low water years. As of today there has never been a water emergency in the lower Bear River but there is going to be one this year. This means that if there is surface water to divert, it will be curtailed to supply senior priority water rights in Utah.

Dan Steenson, Clear Lakes Trout Company, asked for a summarization of the specific impact of ground water withdrawals on the Eastern Snake River Plain at the springs. **Director Dreher** said that the impact is in part due to the evapotranspiration in the water budget of the area. He continued that if there are a little over 1 million acre feet of irrigated lands under ground water, the net depletion to the aquifer based upon the crop mix is averaged to be 1.6 acre feet per acre. So 1 million acre feet being irrigated would cause a depletion to the aquifer of 1.6 million acre feet.

In translating that to the effects on the springs, about two-thirds of the depletion to Thousand Springs is believed to be the result of the conversion from flood irrigation to sprinkler irrigation and to other efficiencies that have been made in the surface water system and roughly one-third of the system depletion, in general, is a result of ground water irrigation above the springs. Whether that depletion causes injury is a function of the water supply otherwise available to the springs.

In response to a question regarding the ground water changes that took place on the Eastern Snake Plain from 1980 - 2002 from **Kay Hardy, Clear Lakes Trout Company, Director Dreher** clarified that over the central portion of the aquifer the changes have not been that significant. There are places where a decline of 25 to 30 feet is significant and a good portion of that decline occurred between 2001 and 2002. So, from 1980 - 2002, in general, aquifer levels did not change significantly. But there are certainly areas such as Gooding, Arco, A & B, have experienced significant ground water level changes and the changes in Gooding probably have

the greatest effect on the springs.

The committee recessed for lunch.

After lunch **Senator Noh** explained that the next general committee meeting will be held May 6, 2004. Commissioner John Keys, U.S. Bureau of Reclamation, will be on the agenda, as well as other key players in the water issue. Recharge, particularly on the Eastern Snake River Plain, will also be discussed.

Senator Noh continued that in order for the general committee to make progress toward a solution, working groups will be formed for the various areas of the state. Each working group will need to go back to their areas and identify existing organizations that are available to help.

The working groups will be broken down as follows:

- **Eastern Snake Plain**

Cochairmen Representative Dell Raybould and Senator Laird Noh
Senator Don Burtenshaw
Senator Stan Williams
Senator Dean Cameron
Senator Clint Stennett
Senator Brent Hill
Representative Maxine Bell
Representative Jack Barraclough
Representative JoAn Wood
Representative Wendy Jaquet
Representative Tim Ridinger

- Mountain Home

Chairman Representative Bert Stevenson
Senator Tom Gannon
Representative Doug Jones
Representative Pete Nielsen

- Treasure Valley

Chairman Representative Mike Moyle
Senator John Andreason
Senator Brad Little
Representative Lawerence Denney
Representative Darrell Bolz

- North Idaho

Chairman Representative Wayne Meyer
Senator Gary Schroeder

Senator Dick Compton
Senator Shawn Keough
Senator Joe Stegner
Senator Skip Brandt
Representative Charles Cuddy
Representative George Eskridge

- Bear River

Chairman Pro Tem Bob Geddes
Senator Bert Marley
Representative Scott Bedke
Representative Larry Bradford

Representative Raybould added that if members have been assigned to a group outside of their area, they are also welcome to join the group in their area as a participant.

Clive Strong, Office of the Attorney General, explained that the Executive Branch will also have a working group. This group will consist of Karl Dreher, Director of the Idaho Department of Water Resources, or his designee, the Director of the Department of Commerce, the Director of Department of Agriculture and representatives from the Office of the Governor and the Office of the Attorney General. They plan to provide technical and legal support to the other working groups and will be a coordinating group. They anticipate that the general interim committee will deal with the broader statewide policy issues and issues of funding. At each monthly general meeting each working group will be required to provide a report of their progress. As the local groups begin working, there will certainly be issues identified that need attention from a state policy perspective that can be assigned to the executive branch working group.

A draft of the initial charges to each working group is available at http://www.idwr.state.id.us/Committee/default.htm and was distributed to committee members.

Mr. Strong continued that the Eastern Snake Plain Aquifer (ESPA) group's charge was taken from the Eastern Snake Plain Aquifer Mitigation, Recovery and Restoration Agreement that the state entered into with local constituents. The charge of the committee is to begin working through the work plan that is in the agreement.

Draft work plans have been prepared for the other working groups similar to that of the Eastern Snake Plain. Each group should review those work plans and come back with any necessary modifications or changes for the next meeting.

Mr. Strong commented that all of the documents provided to committee members will be available at the Idaho Department of Water Resources website: http://www.idwr.state.id.us/Committee/default.htm. This website is intended to be a repository for all of the information regarding the committee. **Mr. Strong** noted, with a group this large, it is impossible to maintain a mailing list so this website will be the main access point for

information. Each working group will have a specific site within the webpage for their information. This will also be used to provide meeting notices to the public and activities or events that are being planned.

The Idaho Department of Water Resources intends to assign specific staff members to each working group and there is some money available to provide outside assistance if necessary. The breadth and scope of this issue will be very difficult for the executive branch to handle without outside consultants. By using staff members and outside consultants that can develop specific products requested by the working groups, the hope is that a deliverable product will be available by the next legislative session that contains a framework for how to proceed with each of these aquifers with a long-term management plan.

Director Dreher explained that the consultants for the Eastern Snake Plain Aquifer group consist of the technical experts that have been involved in the model reformulation and recalibration effort. This group contains consultants from both the surface and ground water communities as well as representatives from the Bureau of Reclamation, Idaho Power, the USGS and others. These consultants are not under contract to the Idaho Department of Water Resources. Pursuant to the agreement, the ground water interests have agreed to continue to make these consultants available. He introduced Dr. Chuck Brockway who represents surface water interests and Dr. Chuck Brendecke representing ground water interests. Other consultants include Greg Sullivan (ground water).

In addition to these consultants there is a need to identify and investigate water management projects that would better allow us to use the limited water supply that is available. The consultants for the ESPA include Brian Patton and Dave Blew from the Idaho Department of Water Resources. The Department also plans to contract with Brockway Consulting. Dr. Brockway was involved in designing many of the water control structures that exist in the Thousand Springs area and is very familiar with the area.

The North Idaho working group consultant with the most knowledge of that aquifer is Dr. Dale Ralston. He has been involved in issues related to the Rathdrum Prairie-Spokane Valley Aquifer as well as the Moscow-Pullman system. The Idaho Department of Water Resources staff people will be Hal Anderson, the administrator for the Planning and Technical Services Group and Bob Haynes, regional manager for the North Idaho Office of Water Resources in Coeur d'Alene. The department person for the Treasure Valley group will be Paul Castelin. Bureau Chief in the Technical Services area. Christian Petrich will be the consultant. He was formerly with the Idaho Water Resource Research Institute and is now a private consultant.

At this time, no outside consultants have been identified for either the Mountain Home or the Bear River group. One reason for this is that there has not been the level of work done in these areas as compared to the other areas of the state. The department is contemplating staffing these areas with two people from the Boise office. They are Gary Spackman, the Bureau Chief for the Water Rights Bureau and Helen Harrington, a hydrogeologist in the Planning and Technical Services group. She works primarily with ground water and critical ground water management

areas.

Director Dreher added that another issue that needs to be considered is how to include owners of individual wells in the process. Currently no licensed water right is required to build an individual domestic well that diverts less than 13,000 gallons per day and irrigates less than one-half acre. On the other hand, 1,200 individual wells that use this much water is significant. That is equivalent to irrigating nearly a section of land.

Representative Raybould commented that this is not a simple task that the committee has been requested to do. The issues are complex and far-reaching. As a result of that fact, the working groups must concentrate on their particular area and work with the consultants provided. He stated that the working groups should follow the items of action listed below before the next general committee meeting.

- Organization Matters
    - Meeting times and locations.

Once these dates and locations are established, the Legislative Services Office will make the necessary arrangements

- Develop a list of key stakeholders and staff.
- Review of the working group's charge.

This is in the information provided in the committee notebook and is also available at http://www.idwr.state.id.us/Committee.

- Establish benchmarks.

Benchmarks will allow the public to review the progress that is being made towards determining the problems and solutions. These include three components.

1. The effect of the aquifer water levels (methods for enhancing water supply and recharge).
2. Water use efficiencies. Are we wasting water and if so, where can that be improved.
3. Reduction of ground water use. Does water use need to be reduced in critical areas?

- Identify questions or concerns for the general interim committee. This includes state policy issues that need to be addressed by the main committee and the order in which they are addressed.

- Prepare a report of any resource needs the working group may need to accomplish its task.
- Each group needs to immediately begin discussions on goals and objectives for aquifer management and management of the state's water resources.

The next committee meeting will be May 6, 2004 and the discussion will include recharge.

Commissioner John Keys from the Bureau of Reclamation and Bill McDonald from the local Bureau of Reclamation will be attending to discuss this issue. Recharge is a very important issue to the federal government. It will be key that the committee work with the Bureau on this issue of recharge. The working groups need to meet as quickly as possible in order to be able to report back to the May 6, 2004 meeting of the main committee. The first item for reporting will be the development of a recharge overview.

- Executive Working Group

This group will also be required to report back to the main committee at each meeting.

- Ground Water Users

The main committee will expect this group to provide an update of the commitments that they have made.

- Congressional Delegation

They will be working with the committee to report on efforts to provide relief under the Agriculture Assistance Act for aquaculture and other alternatives.

Representative Raybould continued that once the working group chairman have decided on meeting locations and dates they should have the Legislative Services Office coordinate the meeting notices. Each working group will be responsible for taking minutes of their meetings and providing a short written report in summary fashion to Legislative Services for distribution in lieu of comprehensive minutes.

The Eastern Snake Plains working group will meet on April 22, 2004, in Burley Idaho.

Mr. Jay Engstrom, Department of Commerce, was introduced to discuss a Business Assistance Grant Program they have been developing that was identified in the SRBA agreement. The legislature appropriated $500,000 to that grant program with the funds being used for infrastructure projects by the affected spring water users. A draft of this plan was distributed and
Mr. Engstrom emphasized that comments for changes or improvements were welcome.

Mr. Phil Rassier, Idaho Department of Water Resources, was introduced to give the committee some background of water management law in Idaho. He explained that the goal of his presentation was to present some of the statutes and discussion of the legal and administrative matters that are involved in issues relating to water.

Mr. Rassier explained that Idaho is a prior appropriation state. This means that when the state was created and the constitution was adopted, it elected to rely on the prior appropriation doctrine which means first in time is first in right.

Mr. Rassier noted that all surface and ground waters are the property of the state whose duty it is to supervise their appropriation and allotment to those diverting the water to any beneficial

use. This means that the State of Idaho, as the sovereign entity, does claim ownership of all unappropriated surface or ground water.

Idaho has five different types of water rights. They include:

- Permits - the state issues permits that allows the development of a water right.
- Licenses- issued after a water right is developed.
- Statutory Claims (I.C. 42-243)
- Beneficial Use Claims (SRBA)
- Decree - issued after an adjudication has been presented before the court and represents ownership of the water right.

Any water right has a number of elements including:

- Source
- Priority date - this is the date that the use of water was initiated under a right or the date an application for permit was first filed. This is most important in times of shortage because it determines who gets to use the water.
- Rate of Diversion
- Nature of Use
- Season of Use
- Point of Diversion
- Place of Use

According to **Mr. Rassier**, under the relation back doctrine, if you file an application for permit, even if you do not put the water to beneficial use until a later date, the priority date still relates back to the time the application was filed.

Mr. Rassier noted the contrast with those who have not followed the application and permit statute where the priority date is the date the water was first diverted and put to beneficial use. This makes it difficult to identify just by looking, who developed first on the stream, who has the most senior priority date. This is the disadvantage of not using the application and permitting system.

Mr. Rassier continued that ground water rights are treated differently for domestic use in Idaho. When the legislature enacted the ground water statute in 1950, domestic rights were specifically exempted from the permitting requirements. All uses require a recorded water right except:

- Domestic ground water (limited to 13,000 gpd and ½ acre) I.C. 42-111
- Other ground water uses if use within 0.04 cfs and 2,500 gpd (I.C.42-111)
- In-stream livestock watering (I.C. 42-113)

Mr. Rassier went on to discuss various types of water rights. The significant dates for when a beneficial use or constitutional use water right can be recognized are:

- Surface Water Right - must have been developed before May 20, 1971
- Ground Water Right - must have been developed before March 25, 1963

These are identified as “4,000" series water rights and will not be confirmed unless they go through an adjudication process. Another shortcoming of this type of a water right is that these are the first rights curtailed in times of shortage.

According to **Mr. Rassier,** the Snake River Basin Adjudication (SRBA) is one of the largest adjudications that has occurred in the country. It started in 1987 and is being handled by the district court in Twin Falls County to determine all claims to the use of water within the Snake River Basin Drainage in Idaho. So far, 107,592 claims have been decreed with 13,852 still pending. By the end of next year, the department will have completed the recommendation of all of the water rights.

At the time that the Snake River Basin Adjudication (SRBA) was being established, the legislature created some exceptions to try to protect the status quo that existed in the state’s irrigated areas. This was to cover those people who had expanded acreage being watered due to the use of sprinklers instead of flood irrigation. Because there is no legal water right in place covering that expanded use, I.C. 42-1426 allows the holders of these claims to file with the SRBA district court and obtain an actual water right for those uses. This is only for uses initiated prior to the date of the initiation of the SRBA (November 18, 1987). Another unique feature of these rights is that they do not add to the rate of flow that was being diverted under the right that was expanded. In order to prevent injury to other rights, these rights were given an advance priority date of 1994.

Mr. Rassier explained that if someone wants to make new use of water today, the only practical way to do that is to transfer an existing right. To transfer a water right a person can change:

- the nature of use
- the place of use
- the point of diversion
- period of use

A water right transfer requires an application with the Idaho Department of Water Resources and approval. An exception exists within the SRBA for transfers that were made without going through the transfer process prior to November 19, 1987.

To qualify for a transfer, the transfer must:

- cause no injury to other rights
- cause no enlargement or expansion of use
- be for a beneficial use
- be consistent with conservation practices

- serve the local public interest

Temporary or emergency transfers are allowed during times of drought as follows:

- there is an approved drought declaration
- $50.00 application fee
- no advertising is required
- approved only for replacement supplies
- unstacking of rights is not generally allowed

According to **Mr. Rassier,** once the water rights are decreed or licensed, the state administers or manages them through water districts and water masters. State water districts are entities of the state and the water users that hold water rights within those districts elect a water master that is approved by the department director. These water districts approve a budget. It is the job of the water master to distribute the rights in accordance with their priority dates and in times of shortage to shut off rights. The water master requires measuring devices and head gates so there are ways of determining the amount of water being used and knowing the water right is being used appropriately. If there is noncompliance with the water right, the department is authorized to issue notices of violation and water use can be curtailed. Water districts have been used up to this point only with surface water systems.

Mr. Rassier stated that outside of water districts, the Director and Idaho Department of Water Resources have some authorities but they are not exercised in the same manner. The director may regulate and enforce compliance of water rights but it is done on a case by case basis. This is one of the main reasons for the initiation of the SRBA. When the Swan Falls controversy arose in the mid 1980s, one of the conditions or provisions of that agreement was that the state would proceed with a general adjudication to determine and quantify all of the water rights within the Eastern Snake Plain and within the Snake River Drainage in order to get a handle on administering those rights. This is where the adjudication is currently. The department has made recommendations for many of the rights and many of those have been decreed. Water District 120 and Water District 130 located above the Thousand Springs area have been created in the Eastern Snake Plain. In response to a question from **Senator Noh, Mr. Rassier** stated that regarding other areas of the state, the provisions of law being described would also apply. The Bear River area has a decree from 1920, the Boise Valley rights have been decreed and active water districts exist. The Boise Valley does not have the inclusion of ground water rights within the water districts and that may happen after the SRBA is completed.

Mr. Rassier continued and noted that conjunctive management is defined as the "legal and hydrologic integration of administration of the diversion and use of water under water rights from surface and ground water sources, including areas having a common ground water supply." Trying to address the effect that ground water use has upon the hydrologically connected surface water is very difficult. There are rules for conjunctive administration that were promulgated by the Idaho Department of Water Resources in 1994.

Under the 1950 ground water act, critical ground water areas were put in place. This provided a tool for the director to designate an area where ground water was not adequate to satisfy all the existing uses or uses contemplated under existing applications. A critical ground water area is defined as "any ground water basin, or designated part thereof, not having sufficient ground water to provide a reasonably safe supply for irrigation of cultivated lands, or other uses in the basin at the then current rates of withdrawal, or rates of withdrawal projected by consideration of valid and outstanding applications and permits, as may be determined and designated, from time to time by the director of Idaho Department of Water Resources." A number of these were designated in the 1960s and 1970s.

Mr. Rassier indicated that a ground water management area is one step short of a critical ground water management area designation. Designating a ground water management area adds some additional tools and puts up a big caution sign to the area. Under recent amendments to that act, the department can propose or require a management plan in these areas. Under both of these statutes, the director can issue an order requiring the curtailment of ground water use by some or all of the right holders.

In addition to water districts, **Mr. Rassier** noted that the state has several other districts that are responsible for water management as follows:

- Water measurement districts - these were established by the department in the mid 1990s in order to get a handle on actual water use within the Eastern Snake Plain Aquifer.
- Irrigation districts
- Ground water districts - in 1994 the legislature authorized the creation of these in the same area as the water measurement districts. These districts have the ability to provide the functions of the measurement districts. The expectation is that the measurement districts will dissolve and not be necessary down the road.
- Ground water management districts - these are not actively used and were for the purpose of rehabilitating wells in certain areas.
- Recharge districts - this was authorized in 1978 and created a recharge district in Gooding, Jerome and Lincoln counties to address the issue of ways to generate more water for ground water users and to address the diminishing flows of the Thousand Springs area.
- Water and sewer districts
- Water distribution entities - these include canal companies, ditch companies and lateral associations

According to **Mr. Rassier**, water right moratoriums may be established by the director to suspend issuance of new water right permits or further development under existing permits.

This presentation is available in full at http://www.idwr.state.id.us/Committee.

Mr. Joe Jordan, Idaho Water Resources Board, informed the committee that they are very interested in the process and plan to attend all of the meeting in order to keep their members

informed of the progress being made. He also stated that they would be happy to provide members to help support the committee or the working groups as needed. He identified the following board members in their respective regions:

- ESPA Claude Storer and Leonard Beck
- North Idaho Bob Graham - Bonners Ferry
  Dick Wyatt - Lewiston
- Treasure Valley Terry Uhling
  Joe Jordan
- Bear River Jerry Rigby

Gary Chamberlain from Challis will be used wherever he is needed.

Senator Noh said the working groups should not be afraid to approach their respective news media to make them aware of what is going on and the progress that is being made.

Mr. Clive Strong, Office of the Attorney General, was introduced to discuss the details of the agreement reached during the legislative session that formed this committee. An outline of this agreement is available at http://idwr.state.id.us/Committee. **Mr. Strong** referred to the fact that the seeds of this controversy go back to when irrigated agriculture began in the Snake Plain Aquifer and specifically surface water diversions. The state did not think about the consequences as development of the ground water supplies in the mid 1960s continued. Another consequence not considered at that time was the conversion from flood irrigation to sprinkler irrigation. A combination of those two factors is what led to the situation today. The Swan Falls Agreement, in his opinion, will be a critical aspect of the committee discussions because at the time of that controversy, the philosophy was that more development would be possible. The essential aspect of the Swan Falls Agreement was providing for additional cfs of development of ground water rights from the ESPA. In dealing with the Swan Falls issues, focus was mainly on the hydropower aspects without addressing how that agreement would integrate into the other development options available.

Mr. Strong noted that this issue was seen again in 1992 when the Twin Falls Canal Company and the Northside Canal Company began to see significant declines in spring flows and had concerns about the impact of those declines on their ability to supply their shareholders with a water supply. As a result, they brought an action to the SRBA asking for a moratorium on further development on the Snake Plain Aquifer. A settlement was reached that led to the modeling efforts on the Eastern Snake Plain Aquifer system of recalibration that are close to being completed. The moratorium was also implemented at that time that is still in effect today.

According to **Mr. Strong,** in the late 1990s the impact on spring users in the Hagerman Valley became so severe that there were a number of delivery calls. This led to the situation today where the state has been forced to come to grips with the diminishing water supplies in those springs and to develop an aqua management plan that takes into account the various interests

involved.

The fundamental premise behind the Eastern Snake Plain Aquifer Agreement is to not look at this on an individual case basis but as a comprehensive problem and how all of the interested parties can work together to find a solution that will maximize the opportunity to keep the industry that was developed based on the policy of the past in place while at the same time protecting property rights.

This legislative interim committee is an essential component of that effort and each of the working groups has an important responsibility of bringing information back to the main committee to allow development of a policy that is reflective of the entire system.

The state has appropriated $2 million to this effort. While that sounds like a lot of money, the impact curtailments under the prior appropriation doctrine can have on the economy is much more significant. There is really no other alternative and it is very important that the state take advantage of this time to solve the problem or at least make progress toward solving it.

Mr. Dan Steenson, Rim View Trout Company, stated that the committee seems to be heading in the right direction. He also represents other aquaculture facilities that were among those that submitted demands for administration last year. These groups were also involved in the Eastern Snake Plains Agreement. As remarkable as the agreement process was, in his opinion, the follow up effort is equally remarkable. The committee seems to have good grip on the situation that is giving the interested parties a lot of confidence that a solution will be reached.

According to **Mr. Steenson,** the spring water users had three concepts in the Eastern Snake Plain Agreement.

- There is a need for immediate relief. If not by way of water supplied to facilities, then by way of financial compensation that would help people get through this year. This has been provided under the agreement.
- To have interim actions that would show both commitment and be a basis for determining what is possible long-term. This component is also occurring.
- Development of a long-term plan. This is being addressed through the interim committee.

The spring water users have within the past few weeks formed the Thousand Springs Water Users Association as a nonprofit corporation. Membership is available to anyone who is a Thousand Springs water user. They are working with the Idaho Department of Water Resources to identify who those people are and they will be sent a notice giving them the opportunity to join the association. The association is contracting with former SRBA Judge Dan Hurlbutt, because of his experience with the relevant issues. The Thousand Springs Water Users Association is also going to be the recipient of the $1 million that is being provided for immediate relief by the ground water users. That money should be available in July and Judge Hurlbutt is also going to assist with the distribution of those funds.

Mr. John Simpson, Clear Springs Foods, noted that there are number of key facts that are important as this process moves forward. They are:

- The reach gain on the Snake River from Milner to King Hill has declined on an average of 20,000 acre feet annually since the early 1950s.
- The reach gain on the Snake River in the American Falls reach has declined almost 11,000 acre feet annually since the 1960s.
- The flows in American Falls are declining annually by about 43 cfs.
- The ESPA mass measurement program indicates declining aquifer levels.
- Ground water wells are drying up on the A & B project.
- Wells are going dry or losing capacity throughout the aquifer.
- Spring flow discharges that historically flowed are today either not flowing to capacity or are dry.

Mr. Simpson noted that the real problem, in his opinion, is that the aquifer is declining and it needs to be stabilized. Once the resource is stabilized, then the state can figure out how to increase it.

Mr. Lynn Tominaga, Idaho Ground Water Users, stated that since August 2001, when the director was about to create a ground water management area in Water District 130 and in Water District 120, the ground water users have been trying to sit down with the spring owners to work out their differences. He stated that during that time period the ground water districts have participated in most of the discussions. The ground water users have converted over 4,300 acres of land from ground water pumping to surface water sources in order to take pressure off of the ground water in that area. This year, 4,700 acres will be converted to surface water. In the last year, the ground water users spent over $1 million to take wastewater from the Northside Canal Company, and water that is leased from the water bank, to supply about 1,600 acres of irrigation water in the Thousand Springs area to avert a water call being made. They spent $351,000 in the last two years buying or leasing water from the water bank to supply water to conversions or to do artificial recharge above the springs. They have also done curtailment when there was no water to buy. The ground water users have made many sacrifices over the last few years toward solving this issue. They are committed to continue working together with all other interested parties to find a solution.

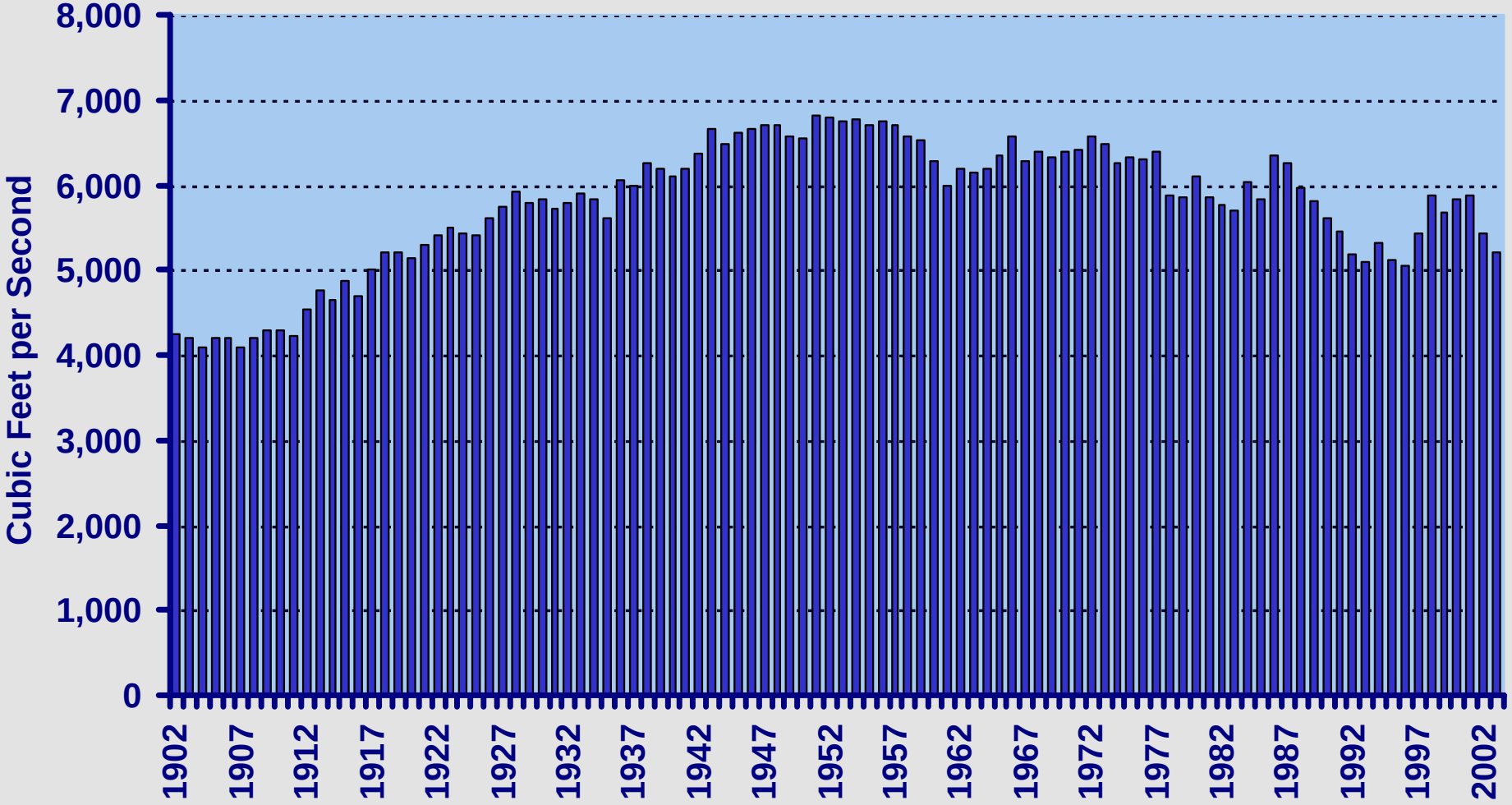
Mr. Tominaga continued that the Ground Water Users would like to make a more formal presentation at the ESPA working group meeting regarding the water flows that accumulated over the period from the 1900s to the 1950s. This presentation will include policy changes and possible economic development for the state that need to be done to help stop the decline in the aquifer.

Mr. Strong emphasized that the committee is not starting with a blank slate. There have been a lot of efforts by spring users and ground water users on both sides to get us to where we are today. This is an important opportunity to bring many groups together to solve the problem.

Mr. Roger Madsen , Director of the Department of Commerce and Labor, was introduced and he pledged that his department will do all they can to help the committee in its efforts.

Representative Raybould thanked everyone on the committee and the working groups. He said that the working groups are the areas where most of the work will be done. It is going to take a lot of compromise and he hopes that this effort will keep the water community in the state together and find solutions that are workable to everyone.

The meeting was adjourned at 3:50 p.m.


AVERAGE ANNUAL SPRING DISCHARGE TO SNAKE RIVER
BETWEEN MILNER AND KING HILL
1902-2003
Cubic Feet per Second
8,000
7,000
6,000
5,000
4,000
3,000
2,000
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1902
1907
1912
1917
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1932
1937
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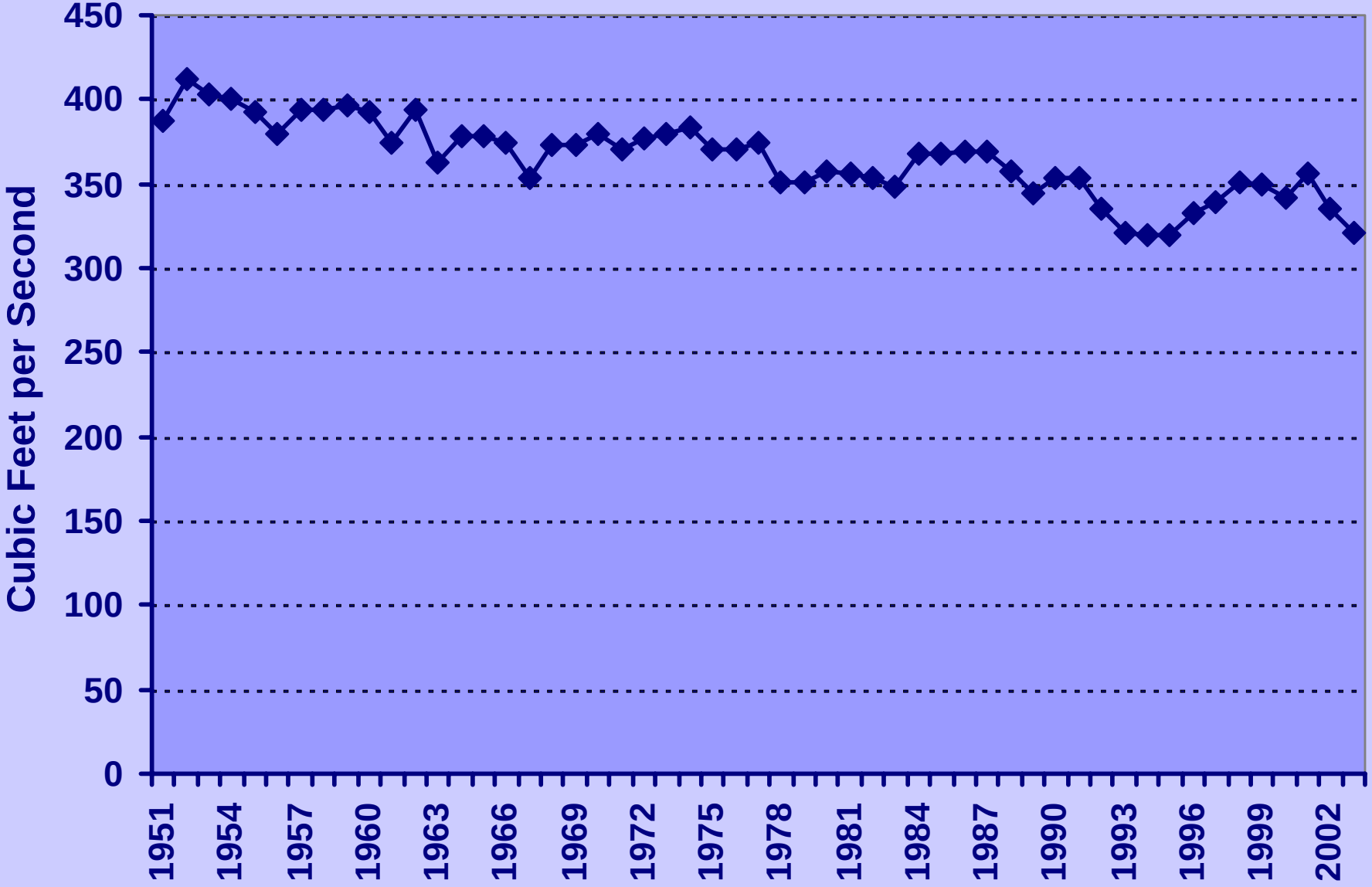
2002

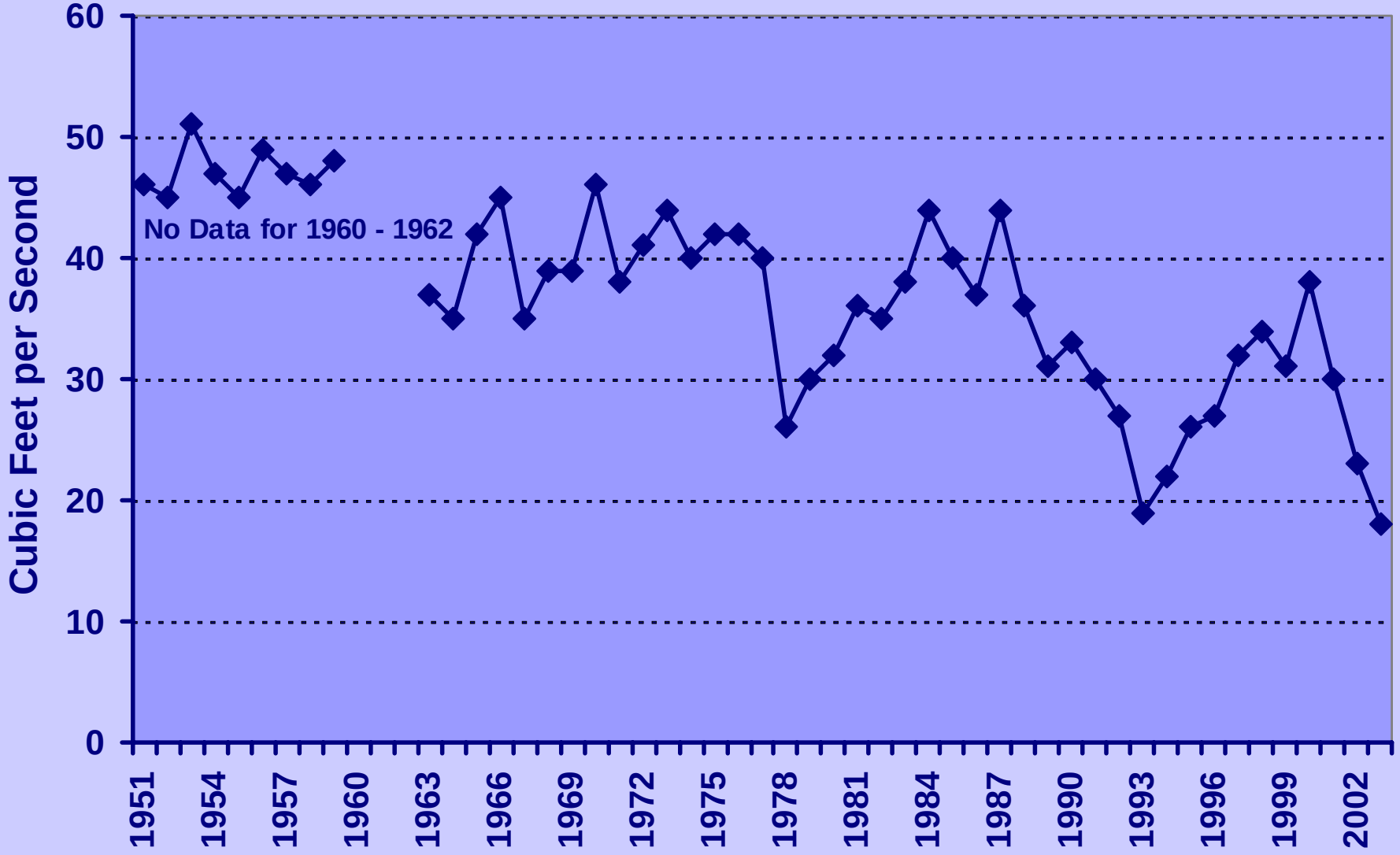
DISCHARGE FROM BOX CANYON SPRING

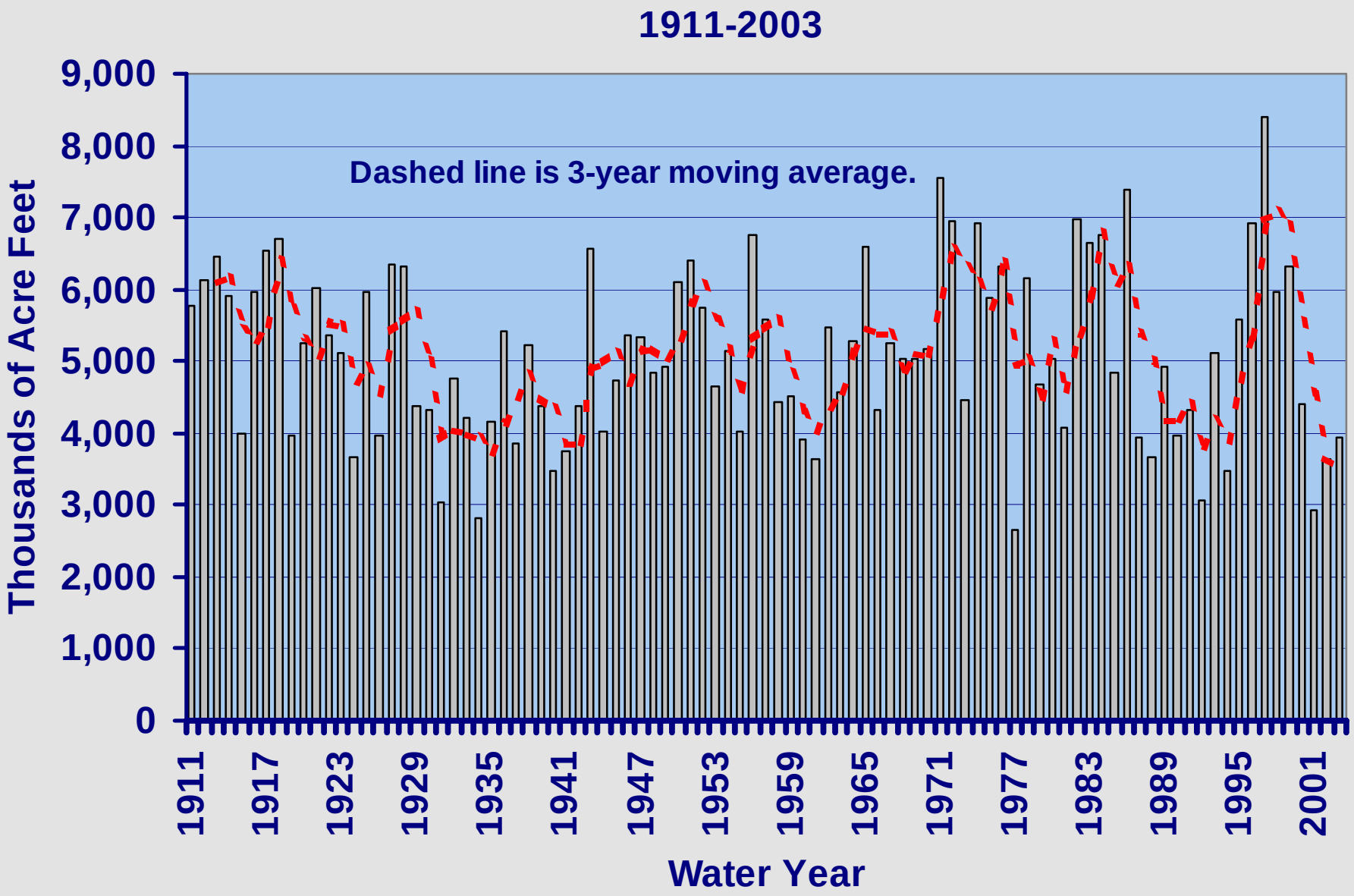
1951-2003



CUMULATIVE SPRING DISCHARGE AT HEAD OF BILLINGSLEY CREEK

1951 - 2003




SNAKE RIVER NEAR HEISE
NATURAL FLOW
1911-2003
Dashed line is 3-year moving average.
Thousands of Acre Feet
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1911
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1983
1989
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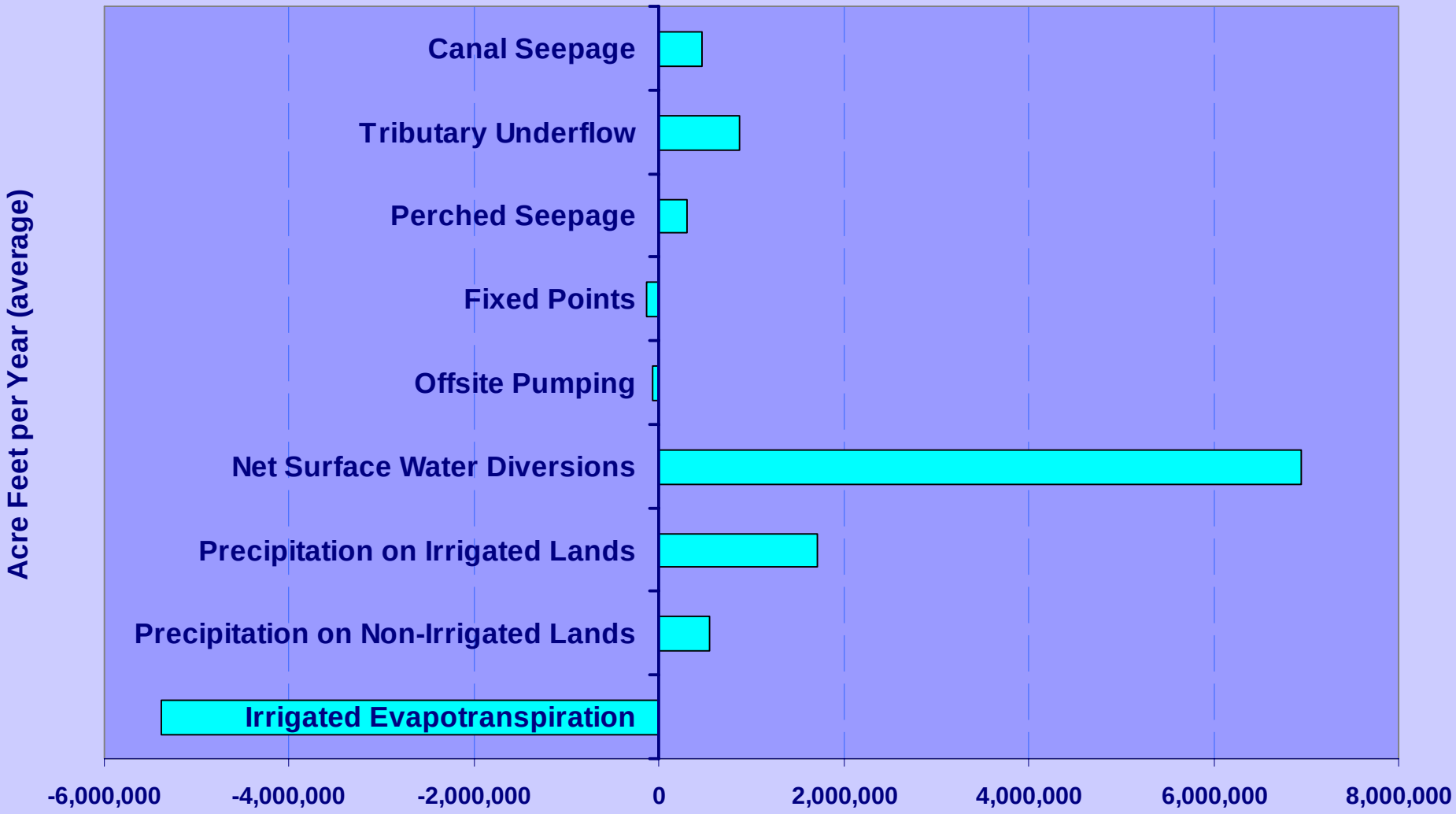
Water Year

Water Budget for Eastern Snake Plain Aquifer