



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

MEMORANDUM

To: Gary Spackman, Director

From: Liz Cresto, Technical Hydrologist *LC*
Matt Anders, Technical Hydrologist *MA*

Date: March 16, 2015

Subject: Recommended revisions to the Surface Water Coalition Methodology

Introduction

On January 30, 2015, the Director of the Idaho Department of Water Resources (IDWR, Department) issued an order to staff directing them to convene a committee of experts to recommend specific technical changes to the "Second Amended Final Order Regarding Methodology For Determining Material Injury To Reasonable In-Season Demand And Reasonable Carryover" (Methodology) signed on June 23, 2010. Department staff created a committee in response to the Director's order composed of IDWR staff and experts representing parties involved in litigation of the Surface Water Coalition's (SWC) 2005 delivery call. In his January 30 order, the Director requested recommendations for technical changes to the Methodology by March 16, 2015, regarding the following specific issues:

1. Revising natural flow forecast methods for Twin Falls Canal Company.
2. Identifying more accurate and current crop data to determine crop water need.
3. Improving the mid-season reasonable in-season demand forecast.

Committee

The committee held multiple meetings and corresponded though email regarding the issues identified in the order. The committee comprises the following members:

Committee Member	Organization	Representing
Charles G. Brockway	Brockway Engineering	Surface Water Coalition
Chuck Brendecke	Lynker Technologies	Idaho Ground Water Users
Dave Shaw	ERO Resources	Surface Water Coalition
David Hoekema	IDWR	IDWR
Greg Sullivan	Spronk Water Engineers	City of Pocatello
Liz Cresto	IDWR	IDWR
Matt Anders	IDWR	IDWR
Scott King	SPF Water Engineering	Idaho Ground Water Users
Sean Vincent	IDWR	IDWR
Sophia Sigstedt	Lynker Technologies	Idaho Ground Water Users

The committee collectively decided that the most efficient method for consolidating member comments while still adhering to the March 16, 2015 deadline was to have committee members attach their comments to this memorandum. All of the committee members had an opportunity to review this memorandum and all of their comments that we received are attached in Appendix B.

Section 1 – Natural Flow Forecast

Background

The Methodology requires the Director to issue an order determining the demand shortfall of the SWC members for the irrigation season. The SWC members include A & B Irrigation District (A&B), American Falls Irrigation District #2 (AFRD2), Burley Irrigation District (BID), Milner Irrigation District (Milner), Minidoka Irrigation District (MID), North Side Canal Company (NSCC), and Twin Falls Canal Company (TFCC). The shortfall is the difference between the forecast supply and the forecast demand for each SWC member. The forecast supply is comprised of two components: the predicted natural flow supply and the predicted storage allocation for each SWC member. Pursuant to the Methodology, the Department undertakes an April forecast and mid-irrigation season forecast.

In the current Methodology, the April predicted natural flow supply is based on a regression analysis comparing the total natural flow in the Snake River near Heise between April and July to the annual natural flow diverted by each SWC member. While the Director only requested revisions to the natural flow forecast recommendations for TFCC, the committee also identified improved models for AFRD2, BID, MID, and NSCC through its work on revised natural flow forecast methods for TFCC. This memo includes recommendations for revising the April predicted natural flow supply forecasts for TFCC, AFRD2, BID, MID and NSCC.

The mid-irrigation season forecast is addressed in Step 6 of the Methodology. The forecast supply in Step 6 is the sum of the actual year-to-date natural flow diverted, plus the predicted natural flow supply for the remainder of the season, plus the actual preliminary storage allocation. The predicted natural flow supply for the remainder of the season was forecast by selecting an analogous year based on the Snake River Blackfoot to Milner reach gains. The selection of the analogous year typically occurred in August and a revised forecasted supply was issued. In working to meet the request of the Director's January 30 order, the committee reviewed a host of models that predict the natural flow supply for each SWC member from July 1 through October 31.

The natural flow supplies for each SWC member are comprised of natural flow in the Snake River passing the near Blackfoot gage and gains which occur in the Snake River between the Blackfoot to Milner reach. The committee reviewed several different models for predicting both the April and mid-season natural flow supply for each SWC member. While many different predictor variables were considered, the following variables were ultimately selected: natural flow in the Snake River near Heise as reported by the U.S. Bureau of Reclamation; snow water equivalent (SWE) data at the Two Oceans Plateau SNOTEL site; Box Canyon Springs discharge; Spring Creek discharge; and groundwater levels near American Falls Reservoir. The recommended model predictors vary by SWC member and by model implementation date (i.e. April 1 vs. July 1) and are summarized in the sections below.

April 1 Forecast

April forecast natural flow supply models were developed using data from 1990 through 2013. Data from 2014 was excluded from model development for two reasons: 1) the dataset for 2014 was still provisional at the time of model development and 2) record rainfall in August of 2014

resulted in significant data anomalies. For these reasons, we decided to exclude 2014 values from the dataset.

Both single linear regression and multiple linear regression models were considered. We recommend that natural flow supply forecast for A&B and Milner continue to be based on single linear regression models, in which the natural flow at the Snake River near Heise is the predictor variable. We believe the natural flow at the Snake River near Heise is a good predictor because A&B and Milner have relatively junior water rights and typically only divert natural flow during the spring runoff events. When applied, the April 1 forecast will utilize the U.S. Army Corps of Engineers and U.S. Bureau of Reclamation joint forecast of total natural flow in the Snake River near Heise from April-July. Alternative models were evaluated, but we found they added additional complexity without significantly improving the existing A&B and Milner models.

New multiple linear regression models are recommended to replace the existing regression models for TFCC, AFRD2, BID, MID, and NSCC. For these entities, the final predictor variables selected for their respective April 1 models included the total April through July natural flow in the Snake River near Heise and the total November to March discharge at Box Canyon Springs. The predictor variable, natural flow in the Snake River near Heise, was considered a good indicator of the natural flow supplied by snowmelt runoff. The predictor variable, Box Canyon Springs, was considered a good indicator for the natural flow supplied by the reach gains in the Blackfoot to Milner reach. If applied, the April 1 forecast models will utilize the U.S. Army Corps of Engineers and U.S. Bureau of Reclamation joint forecast of the natural flow in the Snake River near Heise from April-July.

Below is a table comparing the models used in the current Methodology to the recommended models. The recommended models for each member of the SWC have a better model fit (higher adjusted r^2) and a lower standard error than the models used in the current Methodology.

SWC Member	Models from Current Methodology ¹		Recommended Models	
	Adjusted r^2	Standard Error	Adjusted r^2	Standard Error
AFRD2	0.8317	39,700	0.8448	37,290
BID	0.7964	20,690	0.8546	17,100
MID	0.7896	29,710	0.8786	22,070
NSCC	0.8952	63,580	0.9151	55,950
TFCC	0.5416	71,990	0.8564	37,940

Appendix A contains graphs of the April models in comparison to the actual natural flow diversions for each SWC member.

July 1 Forecast

Step 6 of the Methodology requires the Department to issue a revised forecast supply “approximately halfway through the irrigation season”. New natural flow predictor models have been developed for each SWC member for the specific period July 1 – October 31. We recommended that the July 1 models be implemented when revising the forecast supply in Step 6 of the Methodology.

Using data from 1990 to 2013, regression models were developed for A&B, AFRD2, and Milner by comparing snow water equivalent at the Two Oceans Plateau SNOTEL site on July 1 to the total

¹ Final Order Regarding April 2014 Forecast Supply, April 18, 2014.

natural flow diverted for the period July 1 through October 31. Data from 1997 was excluded from model development because of significant data anomalies as of a result of the high runoff year. The snow water equivalent at the Two Oceans Plateau SNOTEL site was considered a good indicator of additional natural flow diversions after July1. Years with zero (0) snow water equivalent on July 1 were excluded from the model dataset. It is recommended that in years with zero (0) snow water equivalent at the Two Oceans Plateau SNOTEL site on July 1, the predicted natural flow supply for the period July 1 – October 31 for A&B, AFRD2, and Milner will also be zero (0). For A&B, AFRD2, and Milner, the regression models would only be used in those years when the July 1 snow water equivalent at the Two Oceans Plateau SNOTEL site is greater than zero.

Multiple linear regression models were developed for BID, MID, NSCC, and TFCC. The regressions for BID, MID, and NSCC were developed with data from 1990 to 2013 and correlations were developed between the total natural flow diversions from July 1 through October 31 and three predictor variables: (1) natural flow in the Snake River near Heise (April – June), (2) snow water equivalent at the Two Oceans Plateau SNOTEL site on June 15, and (3) March depth to water at well 05S31E27ABA1. Manual well measurements were historically taken from March 13 to March 30, with an average date of March 23. A transducer installed in May 2010 replaced the need for manual measurements. The combination of historical manual measurements and March 23 transducer readings will be utilized in the models.

The regression model to predict TFCC natural flow diversions from July 1 through October 31 relies on data from 1990 to 2013 and utilizes three predictor variables: (1) natural flow in the Snake River near Heise (April – June), (2) snow water equivalent at the Two Oceans Plateau SNOTEL site on June 15, and (3) Spring Creek total discharge (January – May). Below are summary statistics for the recommended models.

SWC Member	Regression based on Two Oceans Plateau Snow Water Equivalent		Multiple Linear Regression	
	Adjusted R ²	Standard Error	Adjusted R ²	Standard Error
A&B	0.9294	741		
AFRD2	0.8699	7,502		
BID			0.8932	11,480
Milner	0.8382	2,939		
MID			0.9037	15,720
NSCC			0.8615	46,930
TFCC			0.8511	29,270

Appendix A contains graphs of the July predictor models in comparison to the actual natural flow diversions for each SWC member.

Section 2 – Current Crop Mix Data

Current Method

Crop mix is one of the variables used in the current Methodology to calculate the crop water need of the SWC members. Crop mix is defined as the acreage of each crop type grown by each SWC member. The current method for determining crop mix is a three step process:

- 1) Tabular crop acreages from 1990 to the present are downloaded by county from the USDA National Agricultural Statistics Service (NASS).

- 2) Based on the tabular data available from 1990 to the present, an average crop mix for each county is determined.
- 3) The average crop mix of the counties is applied to each SWC member based on the proportion of land the SWC member has in each county.

Shortcomings of the current cropping pattern method include: NASS tabular data is adjusted to protect farmer privacy and is becoming increasingly incomplete with fewer acreage totals being reported since 2005, average acreages for a 25-year period do not reflect current crop mix patterns, and county-wide crop mix may not represent the crop mix of SWC members.

Recommended Revision

Based on testing and with consideration of input from the committee, we recommend revising the method for determining crop mix. Instead of relying on county-wide tabular data, we propose using the digital Crop Data Layer (CDL) from the USDA National Agricultural Statistics Service (NASS). Benefits of this proposed method include: (1) using the most recent data available; and (2) restricting the geographic area of the data to the service area of each SWC member. The proposed method would involve the following steps each year:

- 1) Downloading the digital CDL dataset from the NASS website.
- 2) Removing crop type classification errors (speckling) in the CDL dataset with Zonal Statics in ArcGIS. A potential source of error associated with the Zonal Statics process is the intermittent availability of an annual field boundary dataset. However, our review of field boundary datasets and historical aerial photography revealed that field boundaries change infrequently and substituting field boundary datasets from previous years introduces minimal error. An additional possible source of error associated with the Zonal Statics process is the assignment of a single crop type to fields actually planted with multiple crop types. With respect to this concern our qualitative review of historical aerial photography and CDL datasets establishes that fields with multiple crops are rare and we conclude this concern represents a minimal source of error.
- 3) Clipping the CDL dataset in ArcGIS with an irrigated lands dataset for each SWC member.
- 4) Calculating the acreage by crop type for each SWC member.
- 5) Computing a 3-year average by crop type for each SWC member. In our analysis we have found the seven years of CDL data that are currently available do not depict a clear relation between cropping pattern and water supply. Because of this finding, a 3-year average appears adequate to reduce the influence of a single year while still being representative of the current cropping pattern.

Our comparison of the results of the tabular and CDL methods establishes that making this revision will cause the percentage of crop types identified for each SWC member to change between 0 and 30 percent (table below). This range of adjustment appears plausible given the change from a 20-year to a 3-year average and from a county-wide geographic area to the service areas of SWC members. A preliminary comparison of the crop water need calculated using the CDL and METRIC indicates the CDL and METRIC are in general agreement.

Comparison of Crop Mix Derived From NASS Tabular and NASS CDL.

	A&B	AFRD2	BID	Milner	Minidoka	NSCC	TFCC
Alfalfa	20.2%	42.5%	40.4%	27.8%	36.9%	14.0%	29.5%
	19.2%	26.5%	16.8%	20.9%	29.8%	22.4%	22.4%
Barley	11.6%	3.3%	3.7%	12.0%	11.9%	20.1%	12.7%
	31.1%	5.6%	4.3%	15.4%	13.2%	6.9%	10.8%
Corn	3.6%	5.7%	27.8%	14.9%	9.1%	2.0%	11.2%
	3.1%	28.1%	6.8%	11.2%	2.7%	31.3%	18.9%
Developed-Open Space	---	---	---	---	---	---	---
	0.9%	1.1%	3.0%	0.4%	2.0%	1.6%	2.6%
Developed-Low Intensity	---	---	---	---	---	---	---
	0.0%	1.4%	1.9%	0.0%	3.4%	0.9%	2.0%
Developed-Med Intensity	---	---	---	---	---	---	---
	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.9%
Developed-High Intensity	---	---	---	---	---	---	---
	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Dry Beans	3.4%	4.4%	2.9%	9.2%	2.1%	3.6%	16.7%
	8.4%	2.5%	7.6%	13.0%	3.0%	3.6%	11.1%
Oats	0.2%	0.4%	0.4%	0.1%	0.8%	0.2%	0.2%
	0.1%	0.7%	0.1%	0.3%	0.2%	0.1%	1.0%
Pasture/Hay	---	---	---	---	---	---	---
	2.6%	17.1%	5.3%	1.6%	8.9%	11.9%	14.9%
Peas	---	---	---	---	---	---	---
	0.1%	0.0%	0.0%	0.4%	0.1%	0.1%	1.6%
Potatoes	12.2%	11.9%	10.2%	10.5%	7.1%	13.7%	6.3%
	8.7%	3.3%	10.7%	7.6%	11.9%	7.3%	2.7%
Spring Wheat	13.2%	5.2%	5.3%	8.3%	14.6%	15.0%	4.2%
	3.7%	3.7%	4.1%	3.7%	3.6%	1.8%	0.7%
Sugarbeets	12.6%	11.7%	4.0%	9.6%	12.0%	23.0%	6.7%
	18.7%	4.4%	20.6%	10.5%	11.9%	5.6%	3.0%
Winter Wheat	23.0%	14.9%	5.2%	7.5%	5.5%	8.4%	12.5%
	3.5%	5.5%	18.7%	15.0%	8.8%	6.5%	7.4%
---	Data not included in the NASS Tabular Data						
Clear Cells	NASS Tabular Data: Average (1990-2010) % of Crop Harvested vs. Total Crops Harvested Irrigation District Wide						
Shaded Cells	NASS CDL Data: 3-Year (2011-2013) Average Crop Pattern per SWC Member						

Section 3- Reasonable In-Season Demand (RISD)

The committee began discussions on improving the mid-season reasonable in-season demand forecast. With the limited timeframe the committee was given, we were unable to conclude an analysis of methods to improve RISD forecasts. Because this analysis is not yet complete, we cannot currently recommend any changes to the current Methodology regarding this issue.

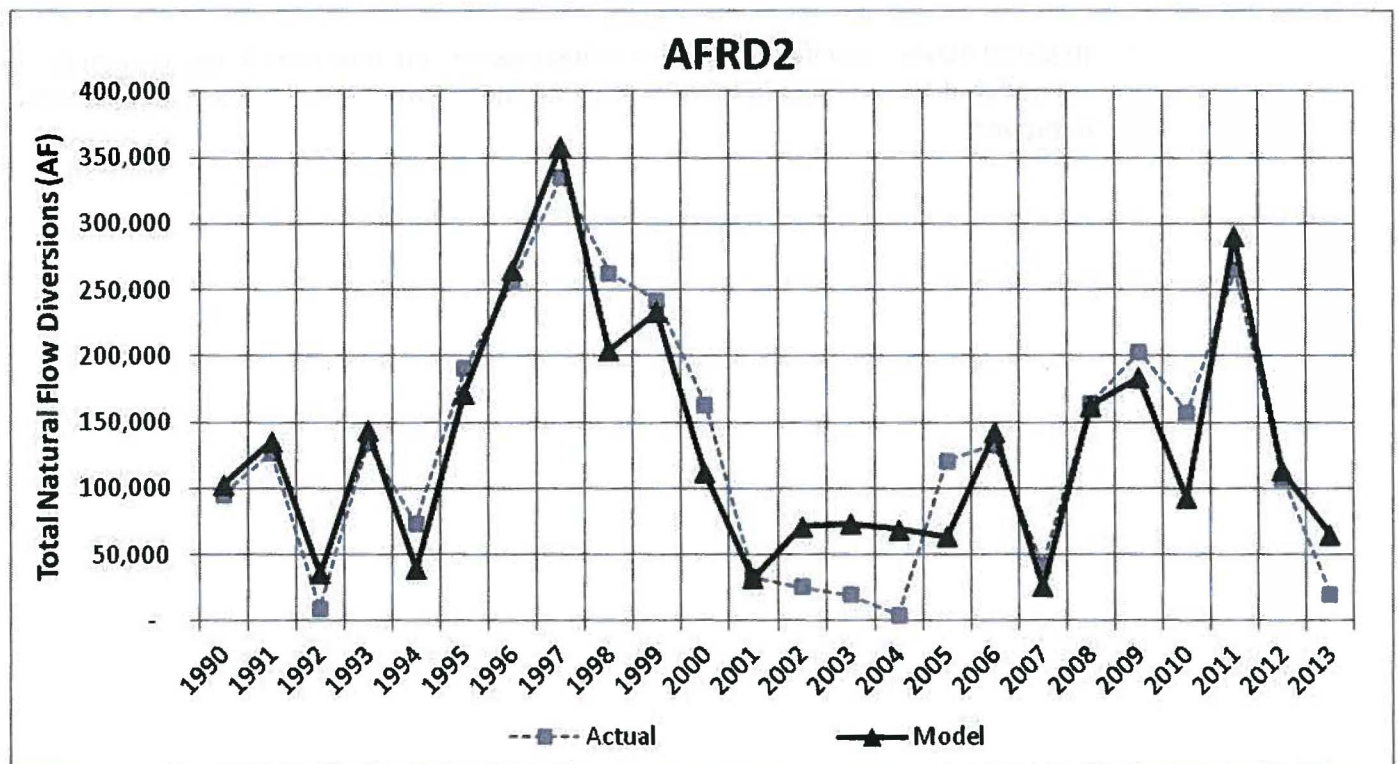
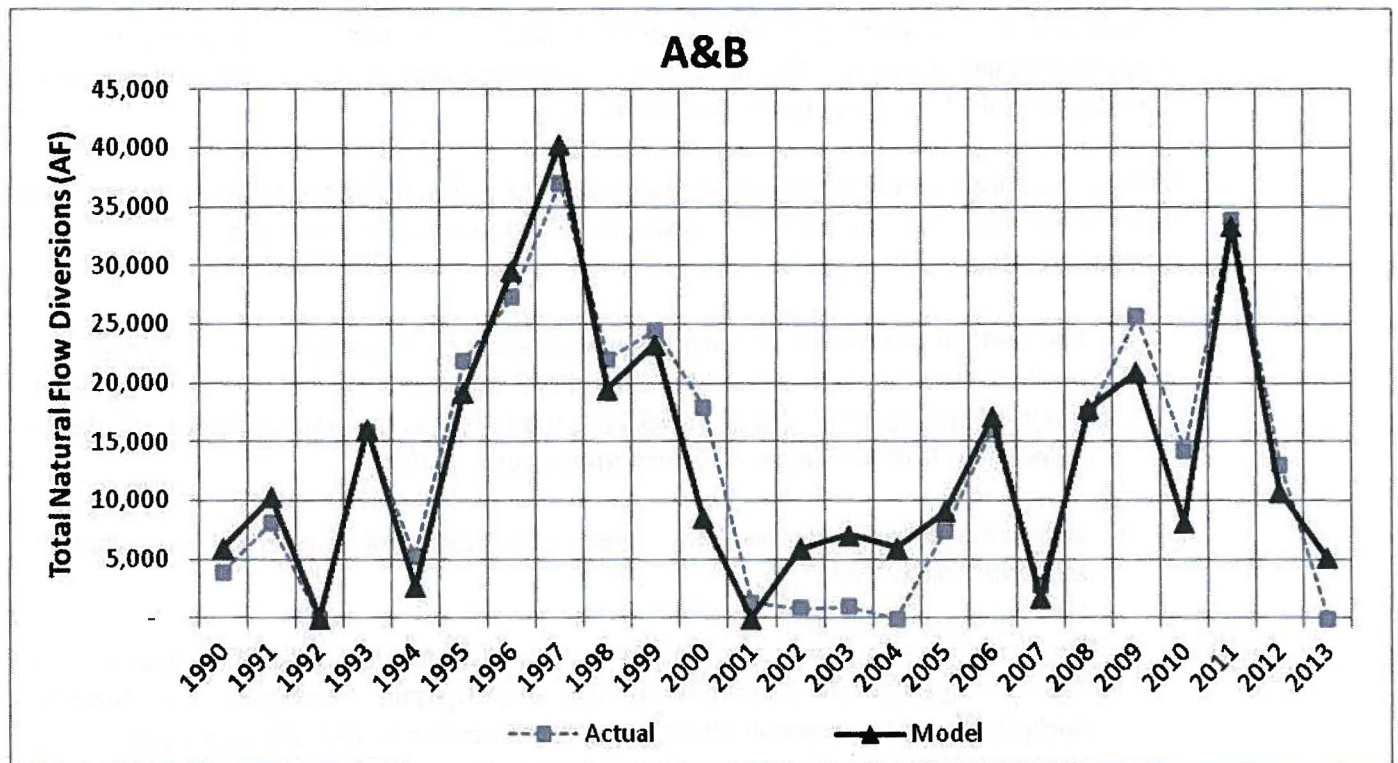
Section 4 – Future Committee Meetings

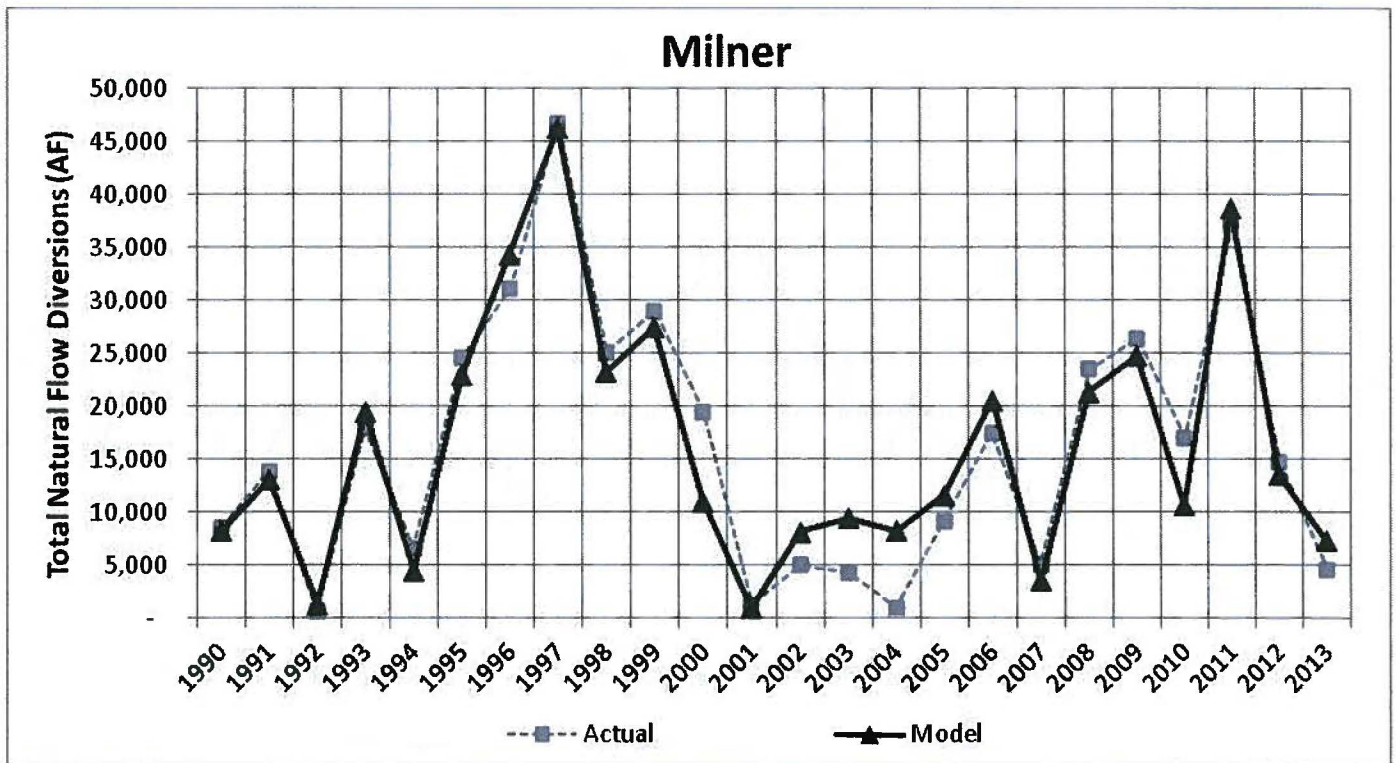
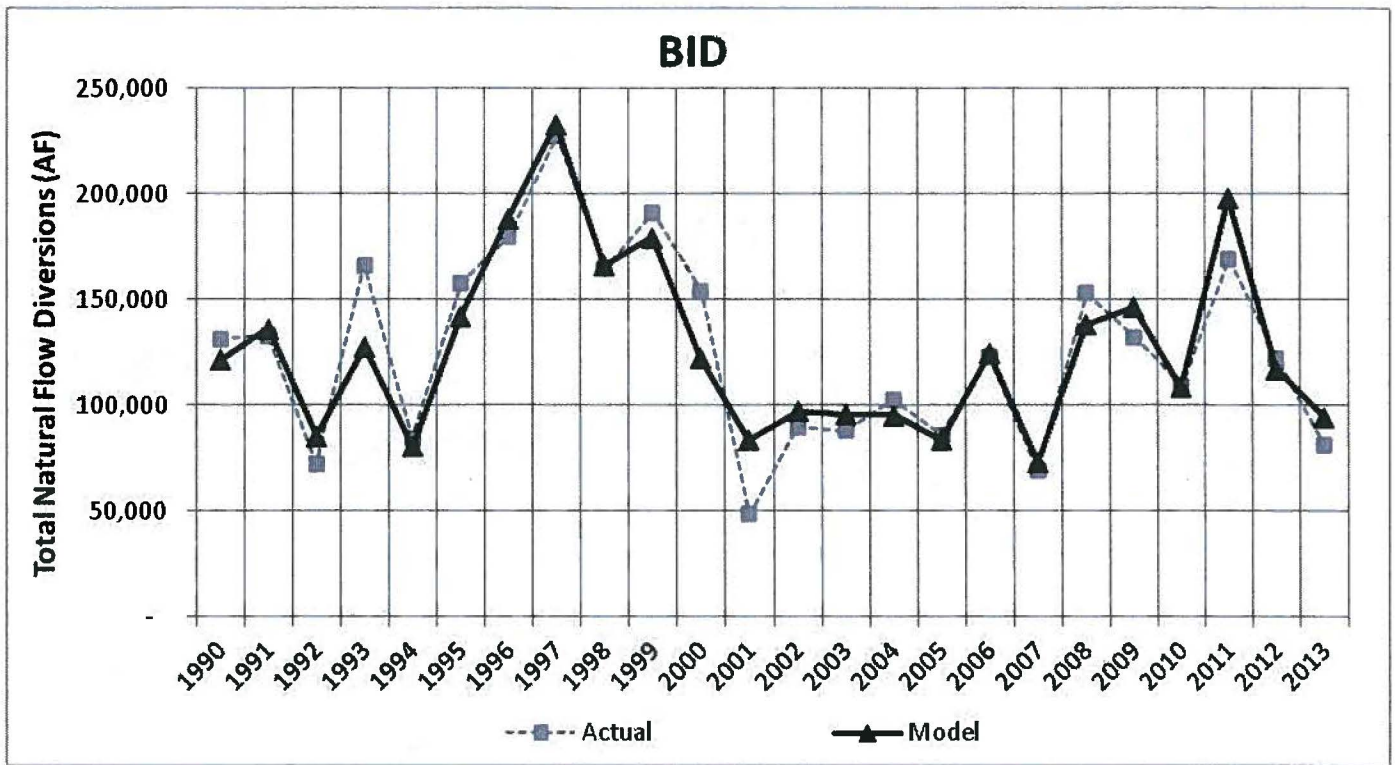
Committee members provided valuable technical input for revising the Methodology. We recommend continuing to convene this committee in the following manner:

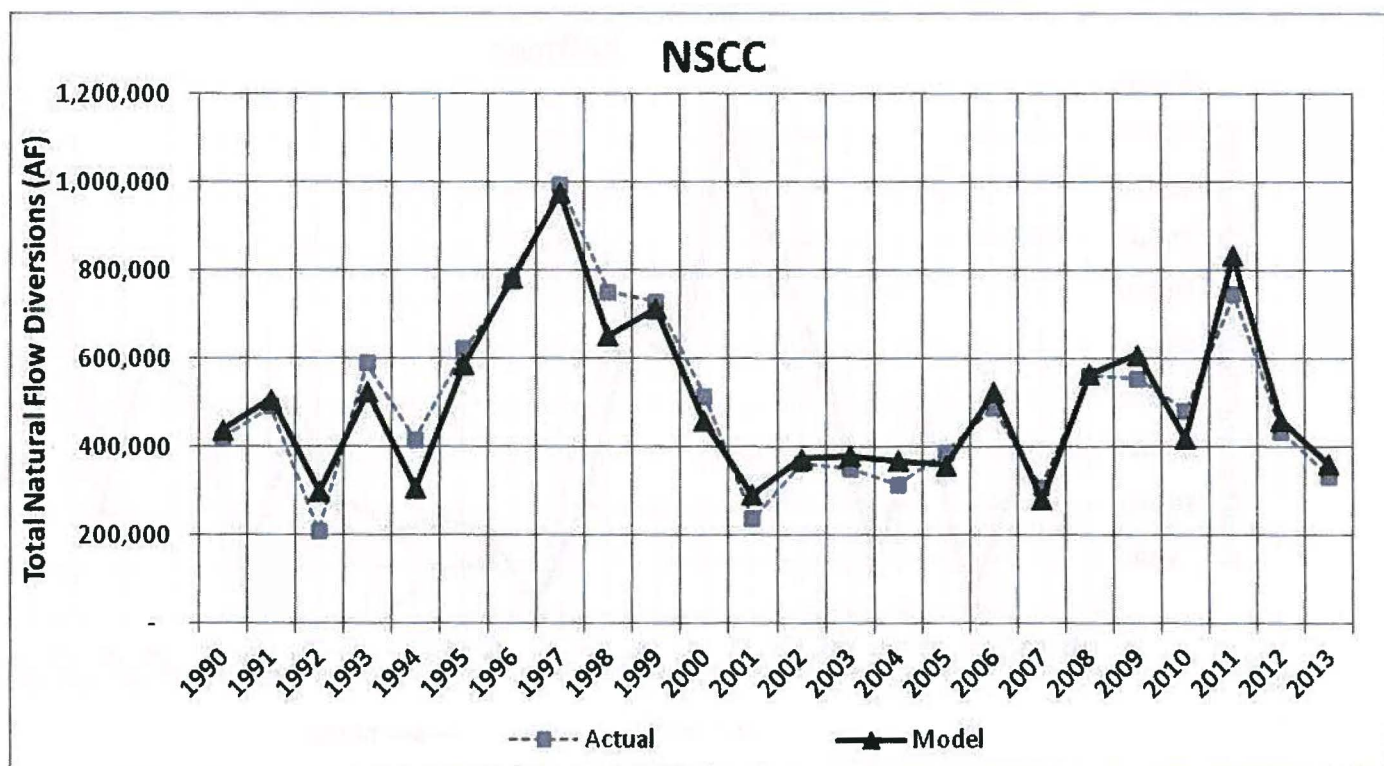
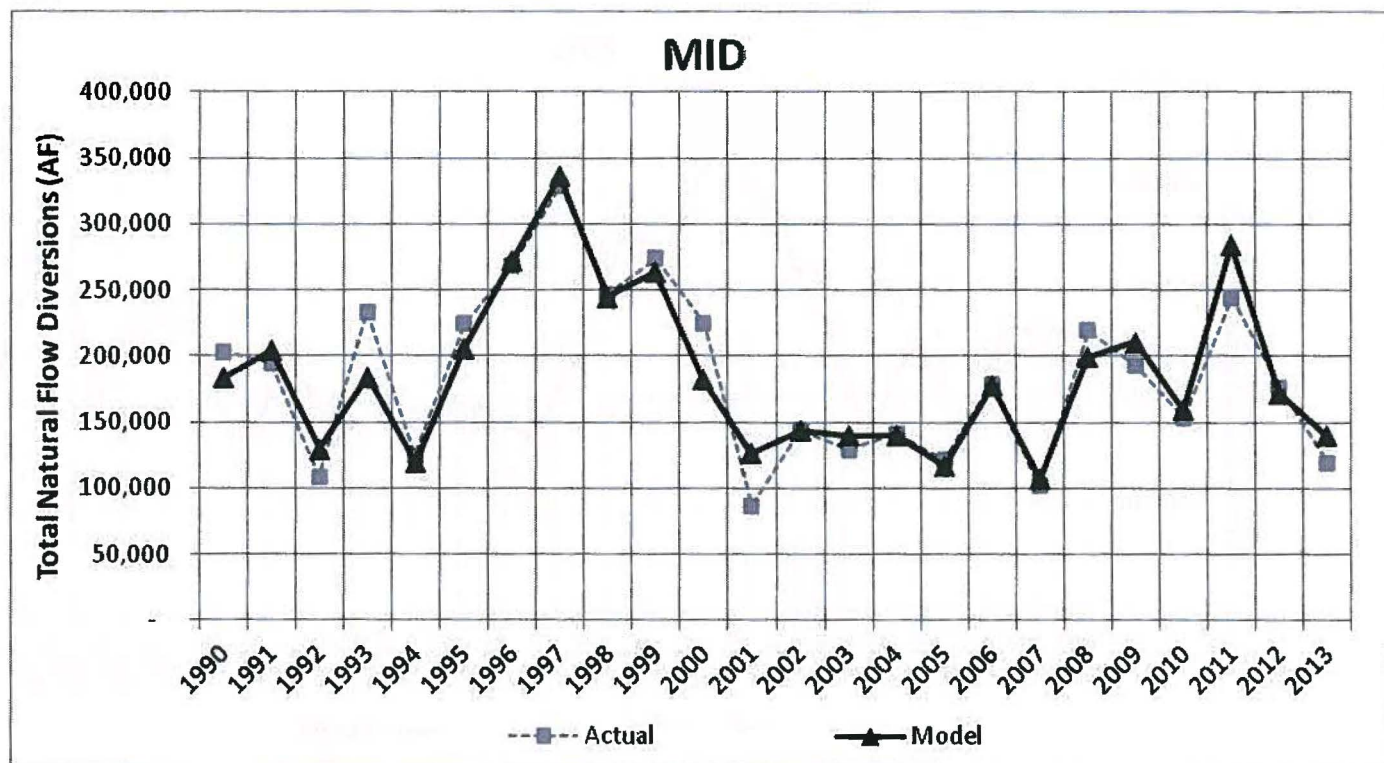
- 1) At least one annual meeting to review implementation of the Methodology during the previous irrigation season. This would be an ongoing forum for identifying and reviewing potential technical revisions to the Methodology.
- 2) Multiple meetings during 2015 to finish reviewing the following subjects that were discussed by the committee, but require further discussion and analysis to develop a recommendation:
 - a. Mid-season calculation of reasonable in-season demand (RISD): The current method uses average demand in 2006/2008 to predict the RISD for the remainder of the irrigation season. We are analyzing the potential for refining this predication by selecting a representative historical analogous year(s).
 - b. Supplemental ground water use: There was insufficient time for the committee to evaluate this subject.
 - c. Project efficiency: The project efficiency variable used in the RISD calculation has not been updated since the Methodology was originally developed. The committee had preliminary discussion about the need to update project efficiency and committee members expressed interest in providing input.
 - d. Irrigated acres: Significant discussion focused on this topic and it was generally agreed that the process for determining irrigated acres for SWC members could be improved.

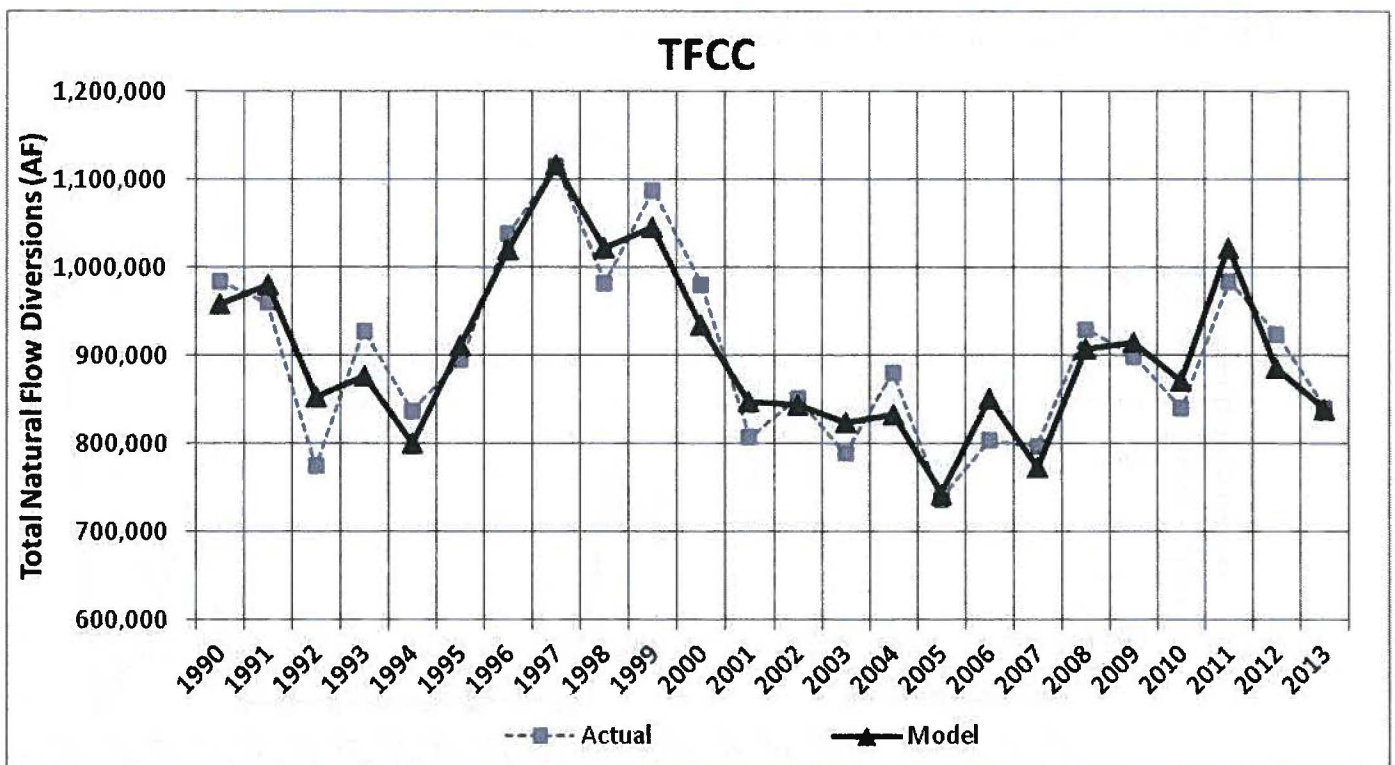
APPENDIX A

Recommended April Forecast Flow Predictor Models

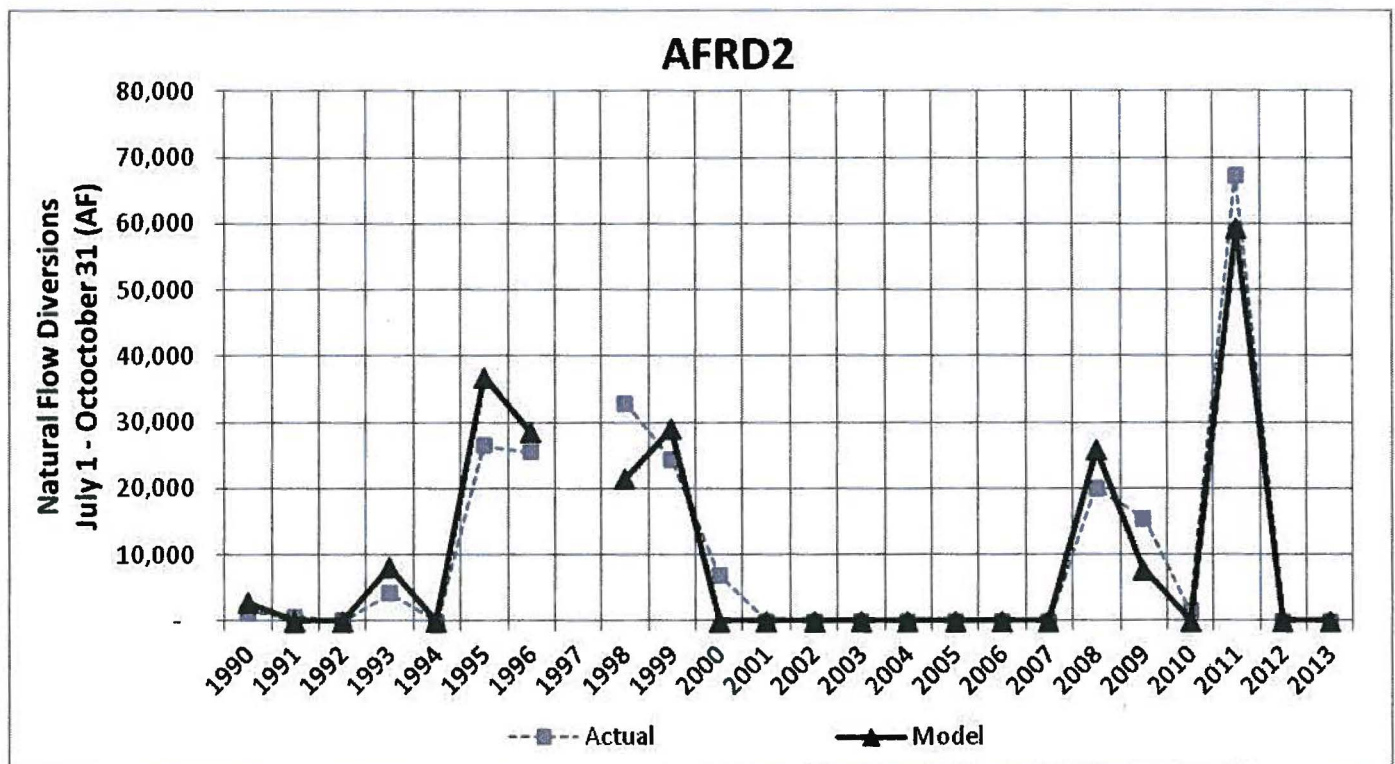
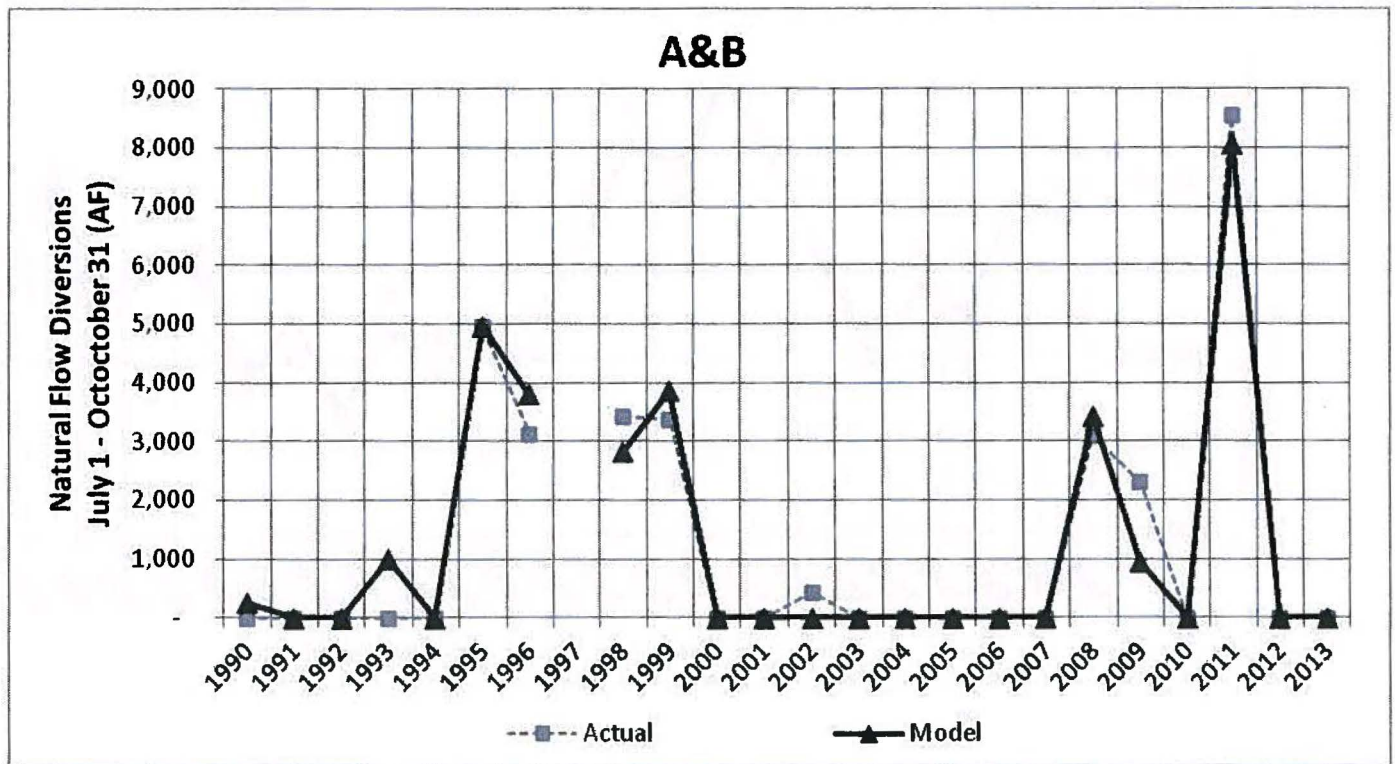


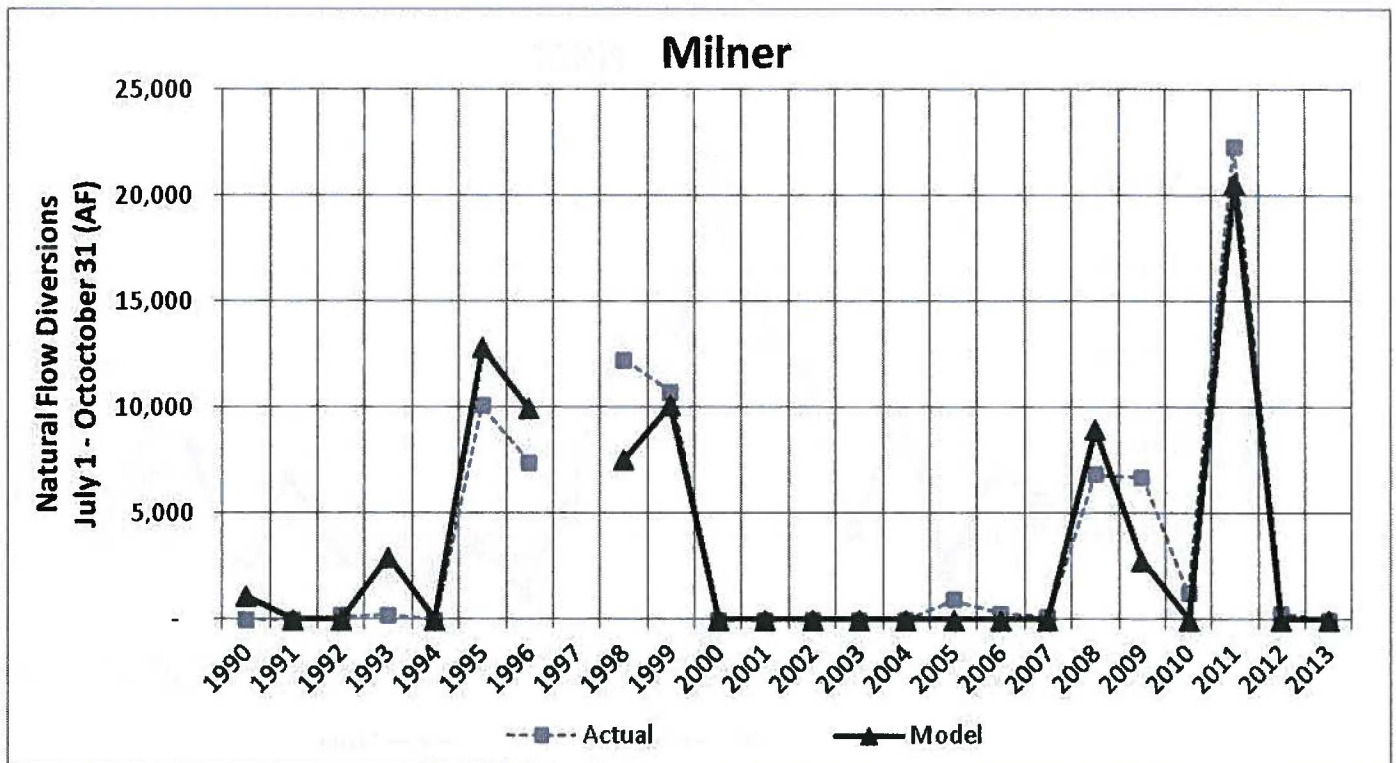
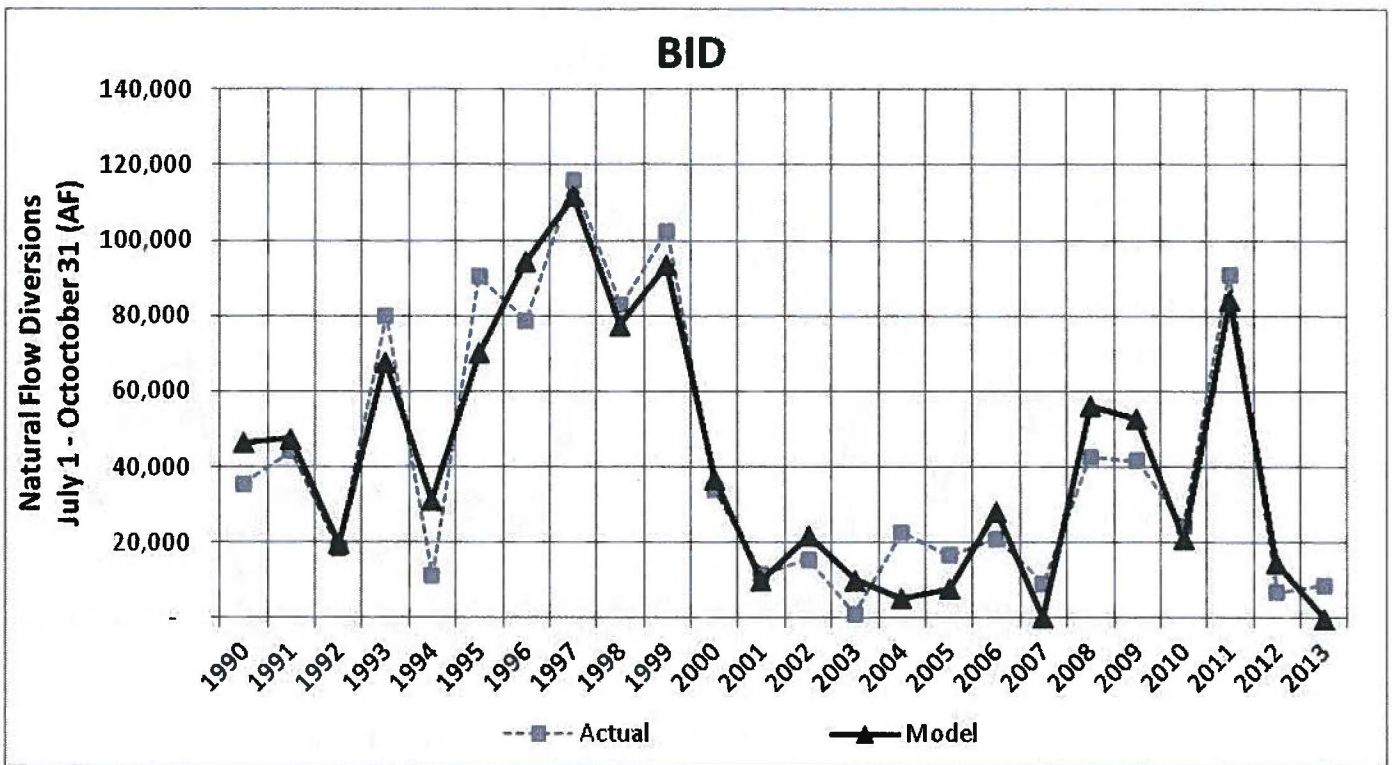


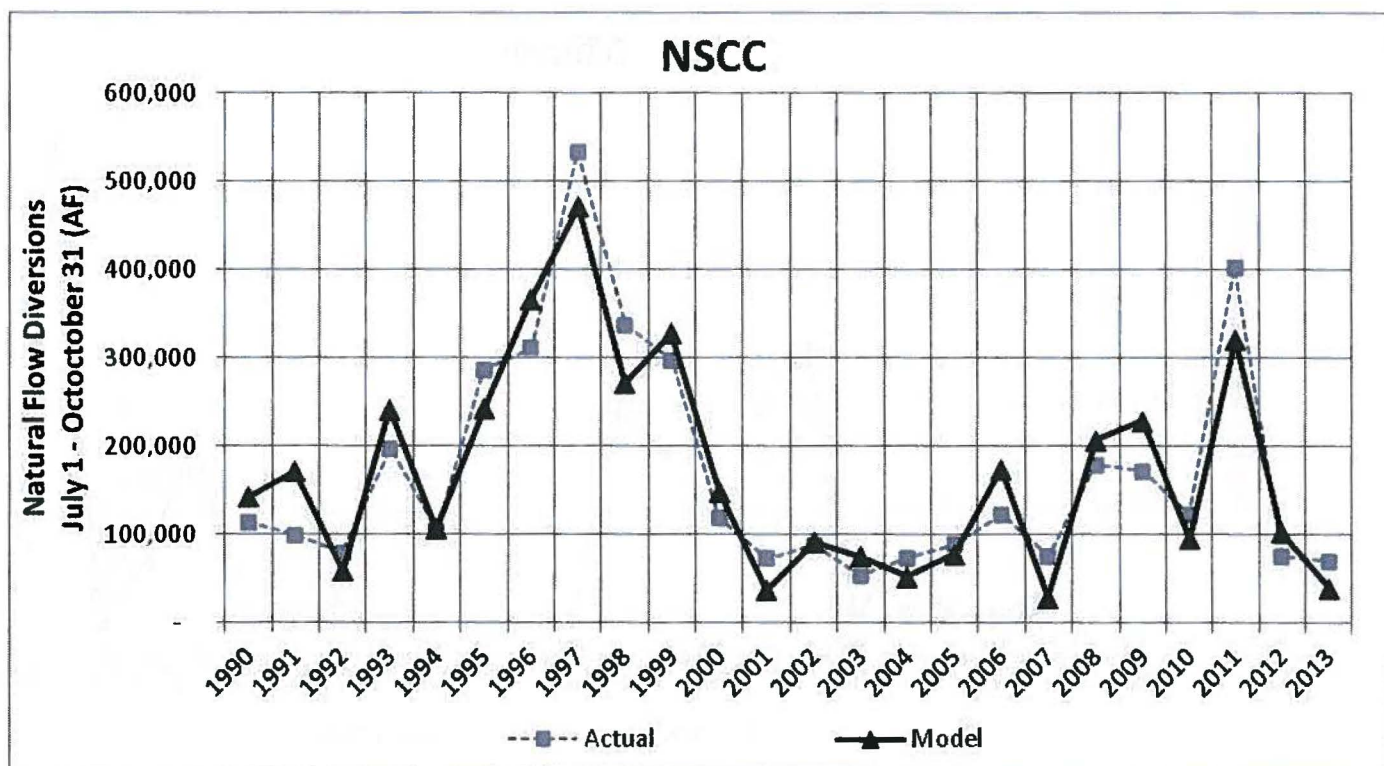
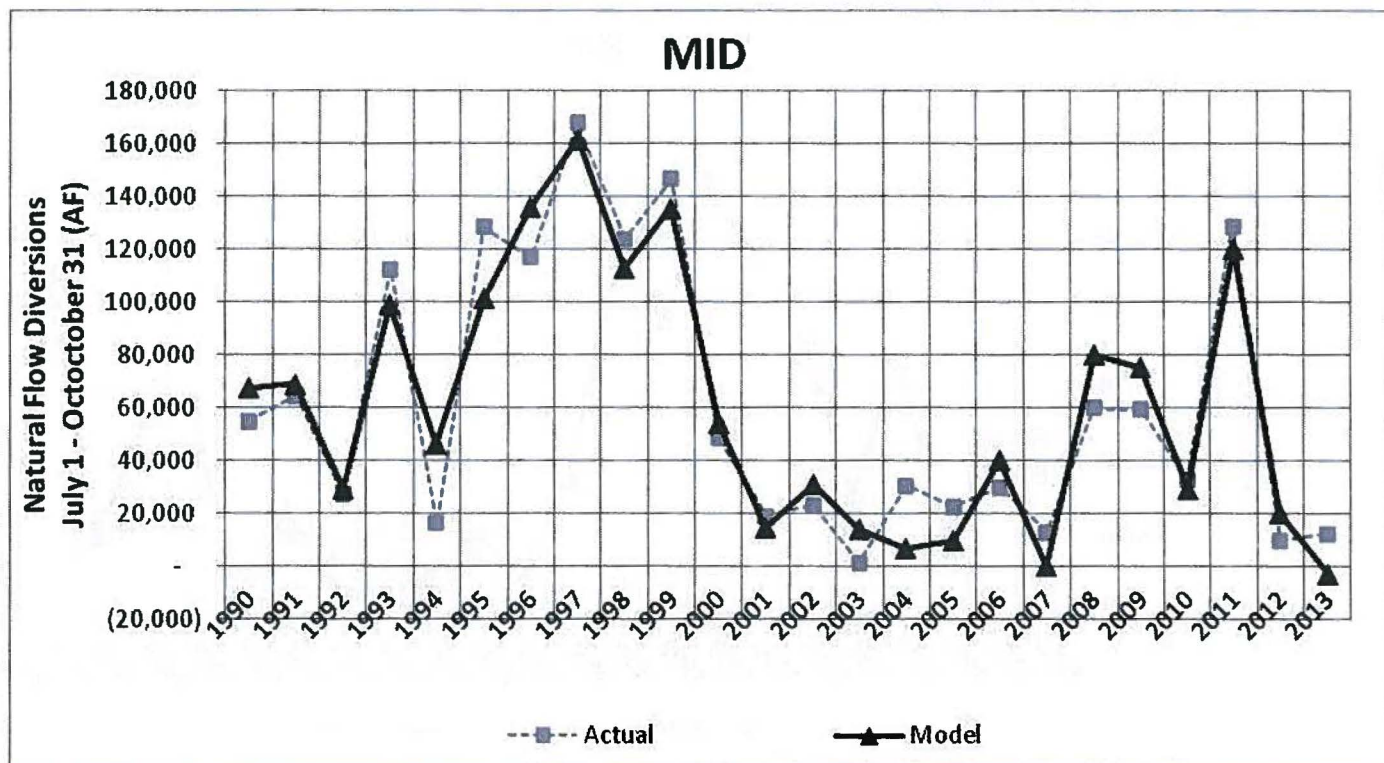


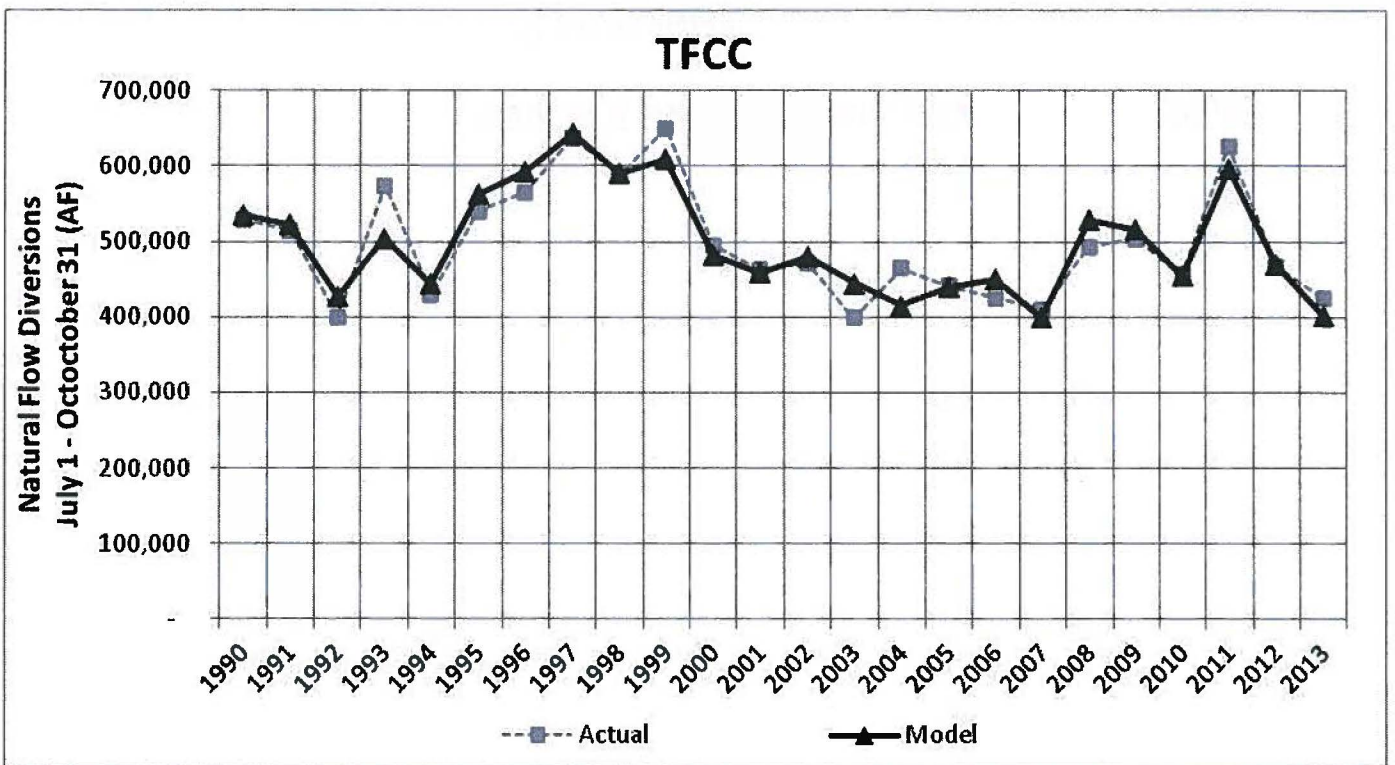


Recommended July Forecast Natural Flow Models









APPENDIX B

Comments Received From Committee Members



MEMORANDUM
Settlement Document Subject to I.R.E 408

To: Liz Cresto

From: Charles Brendecke and Sophia Sigstedt

Subject: Comments on Staff Recommendations

Date: March 16, 2015

This memorandum addresses our comments on the analyses presented to the Technical Working Group related to revisions to the Methodology Order for determining injury to water rights held by members of the Surface Water Coalition. It serves as an addendum to the Idaho Department of Water Resources (IDWR or Department) staff memorandum regarding recommended revisions. Department staff were asked to provide recommendations to the Director on the following topics¹:

1. Revised natural flow forecast methods for Twin Fall Canal Company (TFCC).
2. Identify more current and accurate crop data to determine crop water need.
3. Improvement of mid-season reasonable in-season demand forecast (RISD).

Topics 1 and 2 were assigned priority and due to time constraints are the only topics the Department staff make recommendations on in their memorandum.

Sections 1 and 2 below summarize our comments based on the proceedings of the committee regarding the recommendations to topics 1 and 2, respectively, in the staff memorandum. It is our understanding that Department staff recommendations on topics 1 and 2 are based on analyses that could be completed within the time constraints provided, and that while they are intended to provide guidance for administration of TFCC's water rights for the 2015 irrigation there will be opportunity for further analyses and recommendations concerning both topics for future irrigation seasons. It is also our understanding further work will be done on topic 3 prior to the need for the mid-season adjustment. Section 3 summarizes our preliminary comments regarding aspects of the mid-season RISD calculation.

The three topics identified above are not the only items in the Amended Methodology Order that were set aside or remanded by the District Court. The comments in our memorandum should not be considered a comprehensive summary of our opinion on all the technical aspects under consideration in the remand of the Amended Methodology Order.

¹ Status Conference, January 28th 2015

Section 1

Part D. of the Memorandum Decision and Order on Petitions for Judicial Review of the Amended Methodology Order found that “The *Methodology Order*’s reliance upon the Joint Forecast, and its use of the Heise Gage, to determine the available water supply for Twin Fall Canal Company is set aside and remanded for further proceedings as necessary.” The issue was unopposed and the Department expressed that the Joint Forecast is “not the best evidence” for purposes of predicting TFCC’s supply and that they would be willing to work with TFCC to improve the predictors for future application.

The Department staff’s recommendations for revised natural flow forecast methods for TFCC began with the assumption that the need to predict TFCC’s supply must occur prior to April 1. The comments provided here neither support nor reject that assumption. The Department staff’s recommendations for revising TFCC’s supply improves the current relationship used in the Methodology Order. However the analysis and committee review process was undertaken in a highly compressed timeframe and many things warrant additional consideration. We support the idea of treating the refinements to the Methodology Order as a “living document” that allows for continual improvement and to use the staff’s recommendation as an interim solution for the upcoming 2015 irrigation season only.

We believe that one reason the Heise Gage forecast is not a good predictor for TFCC supply is that the predictor is physically based while the TFCC supply is considered to be the historical TFCC diversion record. TFCC diversions are not the same as the physical supply available to TFCC because the diversions reflect administrative and operational influences in addition to being a condition of the physical natural flow supply. For example, TFCC has the more senior water right relative to the other surface water diverters below Blackfoot and their diversions in early season are often capped by the water right amount rather than the physically available supply. The water right cap creates a non-continuous and non-normally distributed dependent variable in the regression analysis. This difference is a probable reason the Heise forecast alone had such a low correlation to TFCC compared to the other entities. In light of this, an approach that we believe should be further investigated is creating a regression relationship or alternative model that forecasts the physical natural flow supply with subsequent allocation of that physical supply among the rights of the SWC.

The natural flow forecasts for TFCC and subsequently a selection of other entities were improved by moving from a single variable linear regression model to a multilinear regression. The improvement in the TFCC prediction supports the Department staff recommendation in the use of the additional Box Canyon data in April and the Snotel and Spring Creek discharge data in July. The Department Staff also recommended new models for some entities that showed improvement in the July forecast with the addition of Snotel and March groundwater level data. While these newly developed models can be tested over the upcoming irrigation season we believe they can be further improved.

Section 2

Our comments are limited on the succinct issue of the Department staff recommendation to use the digital Crop Data Layer (CDL) from the USDA National Agricultural Statistics Service (NASS) as a more current and accurate crop data source to determine crop water need. One concern here is how the data is post processed. We recommend sensitivity tests to different program settings when raster processing is applied. We also recommend further investigation into the method behind the development of the NASS dataset to determine how and to what extent the data set is field verified or if there are common misrepresentations that should be considered in the process of data quality assurance checks.

Section 3

As the Department memorandum stated there was not sufficient time for the staff to make a recommendation on the RISD forecast. There are multiple components to the RISD forecast calculation that are under review in the current Methodology Order. These include but may not be limited to:

- The mid-season calculation of RISD
- Project efficiency
- Irrigated acres
- Supplemental groundwater use

Regarding the mid-season calculation of RISD the sensitivity and appropriate use of crop coefficients and climate data behind the reference ET in the calculation should be investigated and analyzed for proper application to local conditions.

Regarding project efficiencies we recommend investigation into trends among the entities related to each of the factors the Methodology Order considers in their determination.

Regarding irrigated acres it appears there is not a standard review process for the updates by the SWC or for the critique by IDWR of the submittal of the irrigated acres. With only a check against the total acres in the decreed place of use, there is little or no incentive to keep these shapefiles up to date. Based on the discussion in the technical working group the determination of irrigated acres will likely not be addressed in this review process. Updating irrigated acres by verification of claimed irrigated polygons by satellite and/or aerial imagery is a detailed, time consuming process. But it is essential to protect the valid water rights of juniors.

If SWC members are going to be responsible for this task a first step that the Department should take is to develop a standardized method for this update. This should include pointers to the preferred irrigated polygon base layer, satellite/aerial imagery, and a comprehensive list of items that need to be clipped out (i.e. roads, homesteads, brush land, fallow acres, water features, urban areas, sub-divisions), how alignment issues could be improved and recommendations for how to streamline as many of these processes as possible. This process will only be fair if each user does the analysis in the same way. Once a more accurate representation of the irrigated acres for each entity is created and approved updates in the future can be based more on accounting of the movement of water throughout the district as some of the entities already track. The 5% change standard should also be considered in light of large districts like TFCC where a 5% error

in irrigated acres can result in calculation of tens of thousands of acre-feet of erroneous mitigation obligation.

Regarding supplemental groundwater use there was not sufficient time for the working group or Department staff to address this issue. However, it was one of the specific technical items cited for revision by the District Court. Accordingly, we believe that the process that has been established for identifying Methodology revisions be continued until all the technical issues presented in the remand are addressed.



MEMORANDUM

DATE: March 16, 2015
TO: Liz Cresto, Technical Hydrologist
FROM: Scott King, P.E., SPF Water Engineering LLC on behalf of IGWA
RE: **Comments on Staff Recommendations**
Job: **535.0190**

Liz,

This memo provides comments to be included with your March 16, 2015 Settlement Document Memorandum.

1. The committee discussed the importance of methodology guidance being a living document and that the Technical Working Group (TWG) should continue meeting occasionally to improve the methodology and address items that were neglected due to limited time. I want to express my support for this approach.
2. Supplemental ground water use was a topic of importance to the Technical Working Group's (TWC), but was not evaluated sufficiently due to time constraints. Supplemental ground water use within much of the surface water coalition's delivery area is measured and reported to IDWR. However, we expect not all ground water use is measured due to the wells being located outside of the ground water measurement program area. Unmeasured supplemental ground water use should be addressed and may need to be measured.
3. The total area of lands receiving surface water irrigation deliveries has been updated for some but not all SWC members. The TWC discussed a methodology whereby irrigated acres would be updated if that area changed more than five percent from currently used values. A five percent change is significantly different when comparing between the smaller and larger delivery entities. For example, five percent approaches ten thousand acres for Twin Falls Canal Company. The committee may consider also including an acreage threshold in this decision point. For example: "the lesser of five percent or one thousand acres." This approach is supported by high quality aerial imagery currently available, limited land use changes within the SWC areas, and prior efforts in identifying and digitizing irrigated and non-irrigated areas.

4. Some delivery entities have reported that irrigated acres are unchanged from decreed values. There is not an incentive for SWC entities to identify and report reductions in irrigated acres. This deficiency should be addressed.

Thank you for the opportunity to participate in the committee and provide these comments.

Memorandum Subject to I.R.E. 408

To: Gary Spackman, Director IDWR

From: Charles G. Brockway, Brockway Engineering on behalf of the SWC
David Shaw, ERO Resources Corp. on behalf of the SWC

Date: March 16, 2015

Re: Recommended Revisions to the Second Amended Final Order Regarding
Methodology for Determining Material Injury to Reasonable In-Season
Demand and Reasonable Carryover

The SWC generally supports the efforts of the Director, IDWR Staff and other members of the TWG for their efforts and the recommendations proposed in the staff memorandum to the Director dated March 16, 2015. The recommended natural flow forecasting methods and crop mix determination are improvements to the original methodology procedure and we urge the Director to implement those changes. We also support the annual review of the implementation of the Methodology.

In the second paragraph under the April 1 Forecast section the statement is made that A&B and Milner irrigation districts have relatively junior priority water rights and typically only divert natural flow during spring runoff events. We believe it would be worth noting that Milner's priority is good enough to sometimes divert natural flow at other times, particularly late in the irrigation season.

The SWC supports the use of the NASS CDL data to estimate crop mix for the current year based on the 3 previous years' data. We notice in the example on page 6 of the staff memo the average used is for 2011 – 2013. We assume this is the result of a timing issue since the 2014 CDL was not released until after January 1, 2015. We assume the intent is to use the most recent 3 years' data when used to calculate RISD in the Methodology process. We also want to ensure the SWC Managers can submit crop mix data that becomes available to them if they believe any particular year is an anomaly and would not be fairly represented by the previous 3 years' CDL data.

The SWC is concerned about the topics in the final recommendation for multiple meetings for the remainder of 2015. Most of the proposed topics are not part of the Court's remand order. In particular, project efficiency was fully supported by the court in spite of the ongoing efforts by others to attack that aspect of the methodology or the efficiencies themselves. On remand the Court simply said the Director should follow the order when considering irrigated acreage submitted by members of the SWC. We understand the need to change the water supply forecasting methods to make a mid-season determination and the July 1 methods in the staff memorandum address that need but there has not been a compelling reason given to change the method of estimating demand for the remainder of the year.

Again, thank you to everyone who participated and to the Director and his staff for the opportunity to participate in this effort.