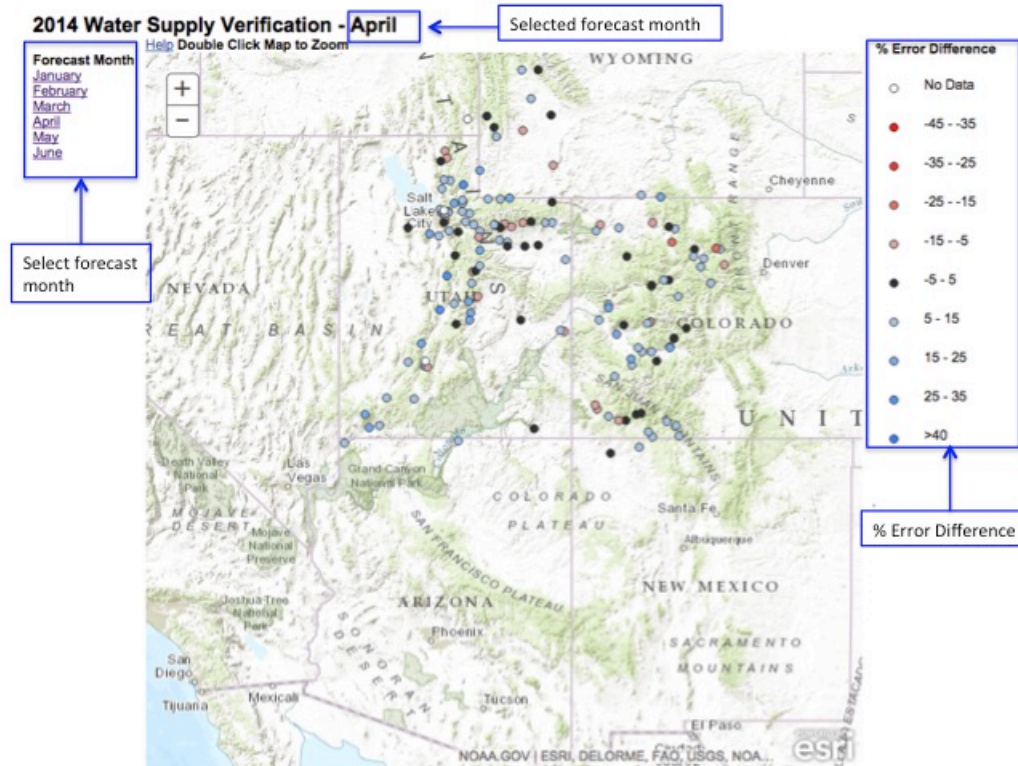**PRODUCT DESCRIPTION:**

The Graphic

Displayed is a map of the current year (e.g 2014) April 1st April-July volume official forecast error compared to the error of the Ensemble Streamflow Prediction (ESP) model. The points displayed on the map are the current water supply forecast points in the Eastern Great Basin, Colorado River above Lake Powell, and the Virgin River.

The legend on the right side of the map labeled % Error Difference represents the current year forecast error compared to the ESP model error as a percentage. This statistic is calculated for each point on the map as follows:

Current Year Official Forecast Error:
 1. *Current Year Forecast Error = Official Forecast - Observed Volume (April-July)*

ESP Model Error:
In the water supply context, large data sets of forecast-observations pairs are not common due to the lack of archived "raw" forecast data. Reforecasts were generated each for each year of the thirty year period of 1981-2010 from the ESP model to create a sufficiently sized dataset needed to draw conclusions about the errors of the ESP model.

1. For each year of ESP reforecasts from 1981-2010 the error is calculated:
   ESP Error = ESP reforecast – Observed Volume (April-July)

2. The mean absolute error (MAE) over the 30 years is calculated:
   ESP MAE= Sum (|ESP reforecast-Observations|)
   30 (number of years)

3. The MAE is normalized by the 30 year April-July average and converted to a percentage:
   ESP Mean Absolute Error (MAE)=   ESP MAE
   30 year Average

% Error Difference:
1*. % Error Diff = (ESP Mean Absolute Error - Current Year Forecast Error) * 100*

PRODUCT INTERPRETATION:

% Error Difference:

The map displays a spatial representation of how the current year forecast error compares to the ESP model error. Ideally, the current year forecast should have a similar or lower error than the raw ESP model. If the current year forecast error is higher than the ESP error, it may suggest a problem with model initial conditions, model adjustments during the season, or data quality issues. This map allows the user to quickly identify locations where the current year forecast did not perform well.

Negative % Error Difference values designated by warm colors (reds) indicate the current year forecast had a higher error than the ESP model.

Positive % Error Difference values designated by cool colors (blues) indicate the current year forecast had a lower error that the ESP model.

% Error Difference values between -5 and 5 designated by the color black indicate the current year forecast has similar error to the ESP model.

PRODUCT MENU OPTIONS:

Default plot and menu:

The Water Supply Verification map defaults to forecasts from April 1st.
Similar maps are also available for the first of month forecasts from January-June by selecting the desired month on the left hand side of the graphic.

A pop-up box is available by clicking on an individual point. The pop-up box includes id and location name, a summary of the % Error Difference for each forecast month,

an option to select additional verification plots and statistics, and location
information (latitude and longitude).

Example of pop-up box:

ID = GBRW4   ▶ ☐ ✕
(1 OF 2)

ID = GBRW4
NAME = GREEN - FONTENELLE RES-
FONTENELLE NR
JAN = -21
FEB = -25
MAR = -4
APR = -5
MAY = 0
JUN = -7
PLOTS = VIEW GBRW4
LATITUDE = 42.0611111111111
LONGITUDE = -110.1
__OBJECTID = 72

ZOOM TO