Water Right Compliance

The Idaho Department of Water Resources has the technical means to identify irrigated fields that do not have a water right, but has not had the technical means to identify someone using water "in excess of the elements or conditions of a water right". To address this short-coming, the Department developed a water-right compliance application based on processing Landsat thermal data in the METRIC evapotranspiration model.

The application used 426 water-right polygons processed through the following steps:

1) Use 2 Consecutive Landsat Overpasses (17 Days)

2) Compute 17-Day Cumulative evapotranspiration (ET_{17})

3) Identify the 426 water right polygons

4) Use Maximum Water-Rights Diversion Rate for 17 Days (DR_{17}) for each right

5) 17-Day Volume (V_{17}) = Polygon Area x DR_{17}

6) If evapotranspiration $_{17}$ > V_{17}, Investigate

The analysis found 18 water right polygons with evapotranspiration greater than the water right could provide. Research by the Idaho Department of Water Resources water-rights personnel showed 15 positives resulted from database issues or water rights transfers in progress, and that 3 positives were valid.

This analysis is significant because the results of the analysis were available less than 2 weeks after the second Landsat overpass date, which enables the Department to take compliance action during the irrigation season. Previously, any similar analysis would have had to use power meter data, and the Department would not have been complete the analysis until several months after the irrigation season has ended.

Landsat thermal data enable Idaho water-rights administrators to monitor legal compliance with water rights in a way not previously available.