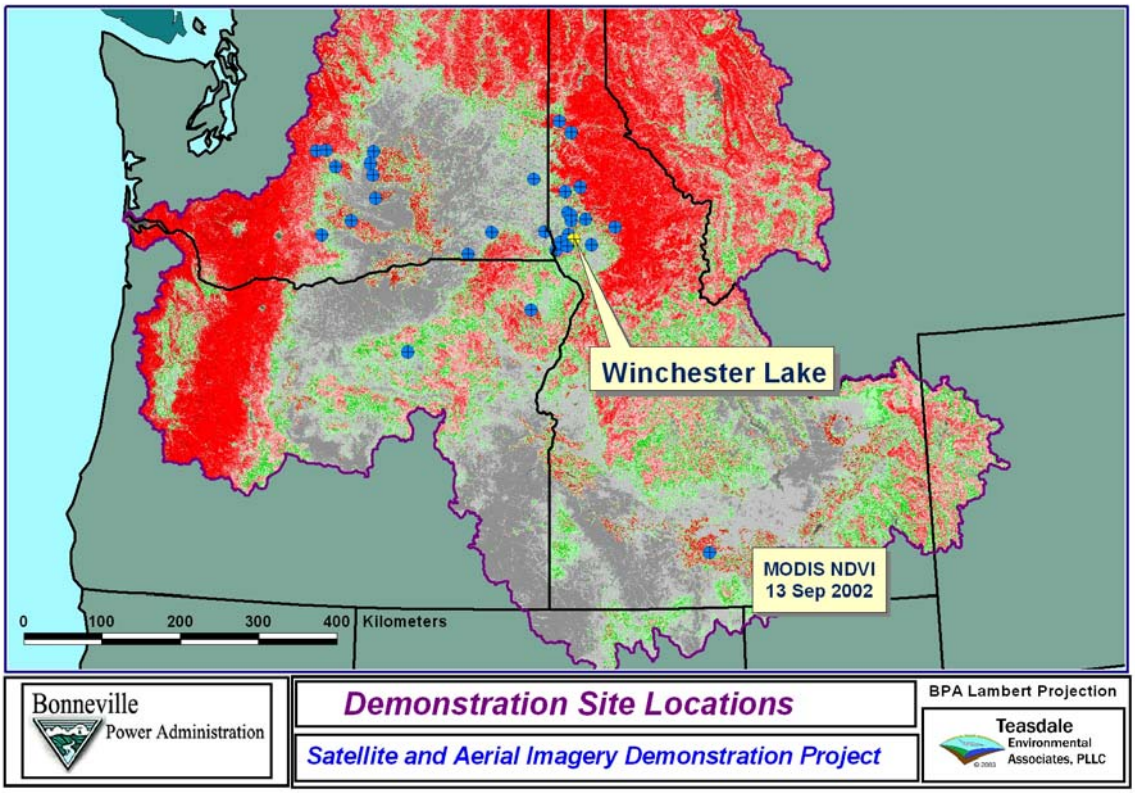
Winchester Lake Demonstration Site	
Location	**Nez Perce Reservation and Lewis County, ID**
Water body	**Winchester Lake**
Ecological Provenance	**Mountain Snake**
Subbasin Name	**Clearwater**
BPA Hydrologic Unit Code ID	**3981**
Hydrologic Unit Code, 6th Level	**170603062802**
Watershed Name	**Clearwater, ID**



Unique Characteristics

Winchester Lake is a 40 ha (100 ac) impoundment on Lapwai Creek near the City of Winchester, ID on the Nez Perce Reservation. Winchester (Lapwai) Lake dam was constructed in the early 20th Century to serve a lumber mill. State of Idaho Parks and Recreation now manages the lake as part of Winchester Lake State Park. The lake is very eutrophic and endures

a large biomass of algae and macrophytes through much of the season. Prolonged ice cover and winter decay of the algal biomass sometimes causes winterkill. Improvement plans are being implemented to reduce nutrient loads. Winchester Lake supports a recreational fishery of planted rainbow trout.

Satellite imagery for this site includes Landsat 5, Landsat 7, and ASTER. Digital color aerial imagery was acquired on September 20, 2001 and September 11, 2002. Digital color infrared aerial imagery was acquired on June 14, 2002 and September 10, 2002. Ancillary data includes topographic DRG's, DOQ's, watershed boundaries, and national land cover data.

Objective

The primary objective was to observe signs of eutrophication and annual changes in late season satellite and aerial imagery. A secondary objective was to observe the trend of land cover changes in the Winchester Lake watershed in a sequence of Landsat and ASTER images.

Results

The satellite imagery and aerial imagery show the littoral macrophyte and algae beds. Late summer 2001 imagery show less signs of algae and macrophytes than summer 2002, but the signs of eutrophication are persistent. Digital visible color and color infrared aerial images show the extent and variability of the macrophyte beds and algae mats. Planktonic algae impart a characteristic color to the visible color and color infrared images across the lake surface. Aerial images shows streaks of near surface planktonic algae, probably aligned with wind, possibly indicating heterogeneous algal concentration.

The Landsat and ASTER imagery also show indications of eutrophication and demonstrate the potential of Landsat imagery analysis as an extensive technique to monitor eutrophication of larger water bodies.