

Freshwater Creek TMDL

Electronic Newsletter

This is the first electronic newsletter for the Freshwater Creek Total Maximum Daily Load (TMDL). The recipients of this newsletter are based on an email list which was created in 2003 with the intent to streamline the process of sending updates to people interested in the watershed and the TMDL without going through the resource and time consuming process of producing and mailing numerous newsletters. We intend to send quarterly updates to this list in the future. These newsletters will also be posted on the Freshwater TMDL website: <http://www.waterboards.ca.gov/northcoast/programs/tmdl/freshwatercreek/freshwater.html>

If you wish to subscribe or unsubscribe to this newsletter, go to the following link: <http://www.waterboards.ca.gov/northcoast/email.html>

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Staffing Changes

Holly Lundborg, who was the acting senior when the Freshwater Creek TMDL development began, has moved on to lead the Basin Planning unit. Mark Neely is now the senior staff for the development of this TMDL. Matthew Buffleben is still the lead technical staff for developing this TMDL. In addition, the Regional Water Board has hired two student interns to assist in the development of the Freshwater Creek and Elk River TMDLs. They are Melissa Cade and Valerie Sherron, both students at Sonoma State University. If you have any questions for staff, please contact Matthew (707 576-2499 or muffleben@waterboards.ca.gov) or Mark (707 576-2689 or mneely@waterboards.ca.gov).

LiDAR

Early on in the TMDL process, staff identified the need for high-resolution topographic maps to improve the accuracy of mapping landslides, roads, and watercourses and to identify areas particularly susceptible to erosion and sediment delivery. Staff determined that Light detection and ranging (LiDAR) could meet this need. As a result, LiDAR was collected for the project area in Freshwater Creek.

LiDAR is a remote-sensing technology that uses laser pulses emitted from an airborne sensor to measure the elevation of objects at or near earth's surface. Data collection includes X, Y, and Z, horizontal and vertical coordinates (i.e., global position and elevation) as well as signal intensity for each laser pulse reflection. When the laser pulse hits a surface, the signal returns to the airplane, thus registering the difference in elevation between the plane and the surface. If the entire cross section of the laser pulse hits a hard surface, such as a roadway or building, there is only one return signal of that laser pulse.

If the first surface covers only a portion of the pulse cross-section, the remaining light will continue to propagate and until it hits a lower surface, then there will be additional returns corresponding to this lower surface. In vegetation, the first surface (e.g. tree canopy) will often cover only a fraction of the laser cross-section and the remaining light will penetrate through openings in the vegetation. Sometimes the remaining light will make it all the way to the ground, and the first, intermediate, and last returns will represent the tops of the vegetation, the vegetation structure, and the ground level beneath the vegetation. The number and distribution of points that penetrate to ground level varies widely in accordance with the density of the vegetation.

The flight was planned to maximize the total number of ground hits. As such, the flight was designed to have lots of overlap between adjacent flight lines; an intensive, but necessary approach to characterize the ground surface in this forested watershed.

Not only is the LiDAR data collection intensive, the post processing of the data is equally important. The data are separated into first and last returns to separate the data corresponding to the upper vegetation from that corresponding to the ground surface. Furthermore, it is important to ground truth the data and ensure that features identified in the data are actually on the ground.

The objective in collecting the LiDAR-based elevation data was to develop a high-resolution bare earth digital elevation model (DEM) covering the Freshwater Creek watershed. We will apply the bare earth DEM, and subsequent watershed mapping and modeling products, in the analyses of sediment sources and delivery for the Freshwater Creek TMDL. These products will improve our understanding of sediment delivery and will help to identify ways to reduce future sediment delivery in the watershed.

The LiDAR flights took place in March 2005. These flights covered most of the TMDL project area: all of the Freshwater Creek and Ryan Creek watersheds and a portion of the Fay Slough planning watershed. The following figures demonstrate the data products of the LiDAR.

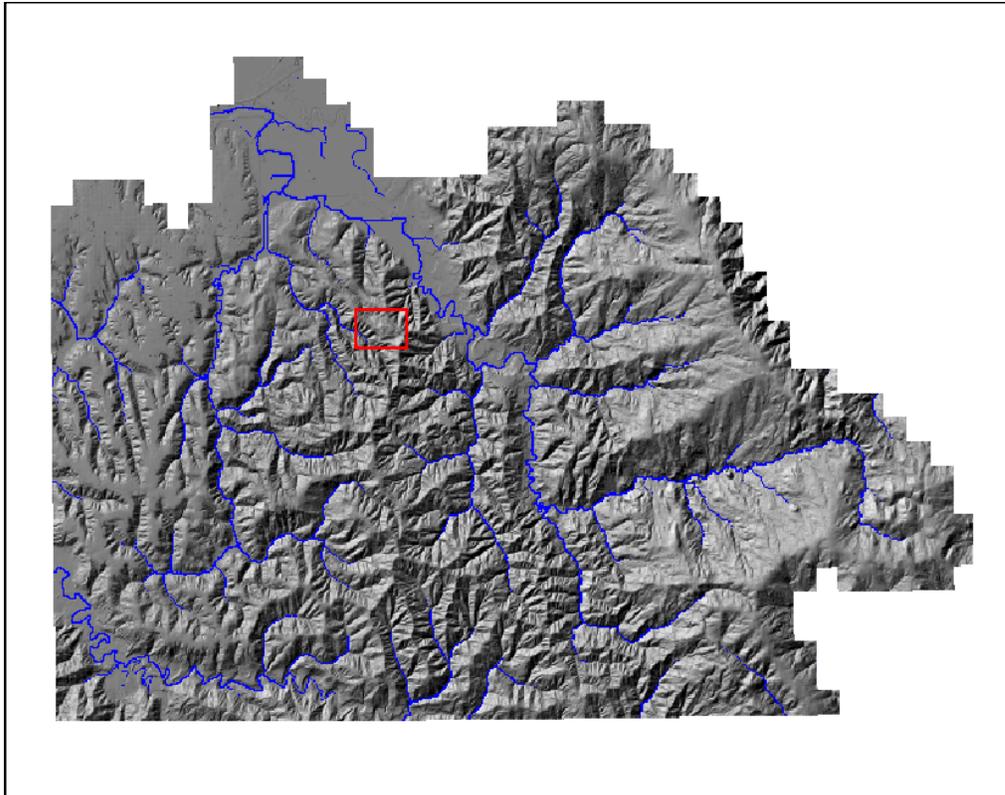


Figure 1. A shaded relief map of Freshwater and Ryan Creeks derived from the LIDAR DEM. Streams (blue) were also derived from the DEM.



Figure 2. A shaded relief close-up of the Cummings Road Landfill as it appeared in March 2005 derived from the LIDAR DEM.

Source Analysis

The first phase of data collection for the source analysis is nearing completion. Air photo analysis and field surveys were conducted to improve our understanding of sediment delivery in the watershed by providing coverage from areas not previously inventoried and to verify earlier source inventories. We will post this report on our website as soon as it becomes available. A second phase will focus on developing a landslide hazard map for the watershed utilizing landslide inventories and slope stability models applied to the LiDAR DEM.

Watershed-wide Waste Discharge Requirements for PALCO.

The following is a description of the WWDRs from a May 9, 2006 Waterboard press release.

REGIONAL WATER BOARD LIMITS SEDIMENT AND RUNOFF FROM PALCO'S TIMBER OPERATIONS IN FRESHWATER CREEK

SANTA ROSA - After three days of testimony, the North Coast Regional Water Board adopted permits designed to improve water quality in Elk River and Freshwater Creek.

The North Coast Regional Water Board heard residents' reports that their drinking water supplies have been ruined, their houses and fields flooded as a result of increased timber harvesting by PALCO in these watersheds. The Board also heard concerns about the economic impact of reducing PALCO's harvest from its employees and the communities they directly support

The Board's action should address all these problems.

The Regional Board's newly adopted permits have two goals:

- § To reduce the amount of sediment discharged from landslides that are caused by timber harvesting.
- § To reduce the number of flood events caused by increased runoff from newly cut land.

"The permits will begin the process of recovery in these watersheds" said John Corbett, North Coast Regional Board Vice Chair. "These permits will lessen these problems, but still allow PALCO to harvest in these damaged watersheds until a complete analysis can be finished. That analysis is called a Total Maximum Daily Load, and will be completed in the next two to three years. At that point a long-term solution will be reached," Corbett added.

PALCO has been harvesting timber along California's north coast for decades. The Board also committed to completing permits for other timber operations in the watersheds.

The Watershed-wide Waste Discharge Requirements (WWDRs) for Pacific Lumber Company, including the Resolution No. R1-2006-0040, the WDRs Order No. R1-2006-0041, and the Monitoring and Reporting Program No. R1-2006-0041 are posted on the web at:

<http://water100.waterboards.ca.gov/rb1/orders/asp/s.asp>

September Board Meeting

A study session with the Regional Water Board is scheduled for September 20, 2006. During the meeting, staff will discuss the following aspects of the TMDL:

- Freshwater Creek and Elk River TMDLs update
- Legal Mechanisms for Permitting, Compliance and Enforcement for TMDL Implementation

The Regional Water Board may provide some guidance on the direction of the TMDL implementation at this meeting as well.

If you would like to learn more about these TMDLs, please attend the meeting in our Santa Rosa office, 5550 Skylane Boulevard, Suite A (707-576-2220).

The next issue of this newsletter will be produced in January 2007. Please contact Matthew (707 576-2499 or muffleben@waterboards.ca.gov) or Mark (707 576-2689 or mneely@waterboards.ca.gov) with any questions or input on this project.