Science and local knowledge reciprocity: landowner-limnologist collaborations at Fernan Lake Trea LaCroix¹ and Frank Wilhelm²

Background

- Fernan Lake is a small lake in northern Idaho that is an important recreational resource and an important aesthetic asset to landowners.
- Blooms of toxic algae (cyanobacteria) related to excess nutrients result in no-contact advisories which decrease the lake's value.
- Landowners around Fernan are keen and willing to solve this problem and restore water quality, providing a unique partnership opportunity between scientists and landowners.



Fernan Lake from the East.

Objectives

- To determine an annual phosphorus (P) mass balance. • Engage landowners and integrate them into the research
- program using a reciprocal learning approach (fig.1).

Methods



Bill Miller (R), a very involved landowner, provided his personal boat to help collect biweekly lake samples.

Automated stream sampler located on landowner property takes daily samples for the analysis of P.

logger which records stream

Happy graduate student taking



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Figure 1: Model of reciprocal learning approach to collaborations between landowners and limnologists. Thickness of arrows represents proportionality of effort or gain for each.

Results

40

500

Δ Storage= 1139 kg P

Between Apr. 2014 and Apr. 2015,1403 kg of P entered, while 264 kg exited, and 1139 kg (81%) remained in the lake. Load depended on discharge which varied seasonally (fig.3).



- lake, 81% of which was retained.
- This P contributes to the blooms of toxic cyanobacteria. We explored the timing of the operation of the outlet dam to examine the wetland P contribution when inundated.







- The reciprocal learning approach was valuable and beneficial for both scientists and landowners. Landowners had constant close contact with scientists and learned the science and its progress.
- knowledge and access to sites.







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