

# Sierra Nevada Conservancy Performance Measures Description

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## Mass of Pollutant Reduced Per Year

### Purpose

The purpose of this Performance Measure (PM) is to measure the pollutant reduction effectiveness of projects.

### Likely Project Categories

This PM would likely be applicable for projects in the following categories:

- Site improvement/restoration
- Monitoring/research

### Variations

This PM is further classified into the following pollutant type variations:

- Sediment
- Mercury
- Other pollutant

### Guidance on Applying this PM to Your Project

The following is a recommended approach to collecting data and reporting on this PM. The process of measuring pollutant reductions is very technical, and it may be necessary for you to hire a consultant to advise you through this process. If your project requires unique steps or considerations, please discuss them with your SNC project manager.

- Data collection:
  - a. In calculating pollutant reduction, you will need to obtain data from a variety of sources, including the International Best Management Practices Database (Geosyntec 2008).
- Analysis:
  - a. Because pollutant-reduction projects are diverse, there are several methods to appropriately estimate the load reductions of each pollutant type. In some cases, ambient monitoring may be cost-effective and provide results within a reasonable timeframe. However, in many cases,

natural variability or other factors may make it difficult to attribute changes to a particular project. In these cases, a modeling approach may be the most effective way to estimate load reductions from a given project.

- b. In general, it is best to use well-documented estimating methods that can be repeated for many projects. (Projects to date have focused on reducing sediment and mercury pollution, therefore information for those type of projects is provided below. However, projects may target other pollutants and grantees should use a comparable approach in measuring reductions).

1. **Sediment** – Sediment reductions can be estimated with the pollutant transport models that were used in design of the physical projects. If a pollutant transport model is not available, you can calculate the change in pollutant loading with the formula below, using flow and Total Suspended Sediment (TSS) levels from both before and after the project.

$$\text{Load Reduction} = \left[ \left( \frac{\text{Flow}}{\text{before}} \right) * \left( \frac{\text{TSS}}{\text{before}} \right) \right] - \left[ \left( \frac{\text{Flow}}{\text{after}} \right) * \left( \frac{\text{TSS}}{\text{after}} \right) \right]$$

Concentration averages are often available in the International Best Management Practice Database (IBMP Database) (Geosyntec 2008). If the concentration values are not available in the database, the best available literature values should be used and documented in a project report. Sediment in waterways should be measured as Total Suspended Sediment (TSS). The load reduction (or the amount of sediment removed annually by the project) should be expressed in tons.

More information about the concentration averages within IBMP Database is available at: <http://www.bmpdatabase.org/>

2. **Mercury** – Mercury reductions from removal of sediment can be estimated with the formula below. The amount of Mercury removed should be reported in pounds.

$$\text{Mercury Reduction} = \left( \frac{\text{Volume of Material Removed}}{\text{}} \right) * \left( \frac{\text{Mercury Concentration in Material}}{\text{}} \right)$$

Mercury removed through water treatment projects can be estimated with the following equation.

$$\text{Mercury Reduction} = \left[ \left( \frac{\text{Mercury Concentration}}{\text{above project}} \right) * \left( \frac{\text{Flow}}{\text{above project}} \right) \right] - \left[ \left( \frac{\text{Mercury Concentration}}{\text{below project}} \right) * \left( \frac{\text{Flow}}{\text{below project}} \right) \right]$$

3. **Other** – For all other pollutants, a method for estimating these pollutants should be proposed by the grantee and will reviewed by the SNC.

- Reporting: The grantee should provide the following information:
  - a. As the grantee, you should report the estimated annual reduction in the targeted pollutant as well as the estimated number of years that these reductions are predicted to continue.
  - b. You should provide information about pollutant loads that are either reduced directly by the project or avoided as a direct result of the project. Estimates of both annual average load reduction (reported as tons of sediment or pounds of mercury, for example) and effective lifespan (in years) of the project should be provided.
  - c. Sample reporting format is as follows:

Pollutant Type	Average Annual Reduction (mass)	Estimated Lifespan (years)
(example) Sediment	999 Tons	15 years

### Other

Calculating pollutant load reductions is likely to require specialized expertise to support grantees. Grantees may wish to utilize consultants to assist in this effort. The first-year process is expected to require 40-100 hours, while later years will generally require less than 40 hours of grantee time.