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Glossary of Terms

General Performance Measurement Terms

Actions

Specific activities taken to achieve incremental progress toward a goal.

Adaptive Management

A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form – “active” adaptive management – employs management programs that are designed to experimentally compare selected policies or practices by evaluating alternative hypotheses about the system being managed.

Ambient monitoring

All forms of monitoring conducted beyond the immediate influence of a discharge pipe or injection well and may include sampling of sediments and living resources.

Assessment

Assessment is the ongoing process of documenting, often in measurable terms, the progress of your activities.

Baseline

1. Information gathered at the beginning of a study from which variations found in the study are measured. 2. A known value or quantity with which an unknown is compared when measured or assessed. 3. The initial time point in a monitoring sequence.

Benchmarks

Standards or averages by which similar items can be compared.

Beneficial or Designated Use

Water use taking place within a waterbody and/or protected for continued future utilization; e.g., hydro-electric power generation, navigation, drinking water supply, fish propagation, recreation (swimming, boating, fishing, etc.).

Best Management Practices (BMPs)

Methods or practices selected by entities managing land and water to achieve the most effective, practical means of preventing or reducing pollution from diffuse sources, such as pollutants carried off the landscape via urban runoff, excessive hillslope or stream bed and bank erosion, etc. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during and after pollution producing activities to prevent, reduce, or eliminate the introduction of pollutants into receiving waters. BMPs is a term that is more specific than Management Measures and refers to demonstrated, effective, and practical sets of measures to achieve certain goals.

Bioindicators

In this context, bioindicators reflect biological attributes of ecosystem condition and represent signals that relay a complex message, potentially from numerous sources, in a simplified and useful manner. Bioindicators are measures, indices of measures, or models that characterize critical biological components of ecosystems.

Biological monitoring (or biomonitoring)

The use of a biological entity as a detector and its response as a measure to determine environmental conditions. Toxicity and exposure tests and biological surveys are common biomonitoring methods.

Biological parameters

Include measures related to the plant and animal life of the water body, such as fish species diversity and abundance, or the presence or absence of indicator fishes, aquatic invertebrates, or aquatic plants.

Capacity-building

The act of improving the expertise and skills of personnel in relation to the responsibilities and tasks which they will carry out. It is generally considered to be a specific part of institutional and community-strengthening activities.

Chemical parameters

Include contaminants such as metals, dissolved nutrients, oils, and pesticides, and also include chemical properties of the aquatic system such as dissolved oxygen, chemical oxygen demand, and acid neutralizing capacity.

Conceptual model

A visual interpretation (usually a schematic diagram) that describes the components of a system and how the components are believed to interrelate and interact to function as a whole. The model may be conceptual or numerical and often serves to indicate the linkages and interrelationships between metrics, actions, and goals.

Data Quality Objectives

Statements about the level of uncertainty that a decision- maker is willing to accept in data used to support a particular decision. They include specifications of how good the results should be (e.g., tolerable measurement error) and what each result should represent.

Desired Outcome

Ideal achievable result or impact that you want to attain.

Diversity (of aquatic species)

The variety of different species detected through inventories in a given area. Other types of diversity sometimes addressed by surveys or inventories include genetic and habitat diversity.

Ecological conditions

The degree of functionality or health of an ecosystem as measured by a broad array of indicators. This may include measurement of biotic characteristics (e.g., native plant communities, fish or invertebrate populations, species and habitat biodiversity) and/or abiotic characteristics (e.g., streambank stability and erosion, assimilation and cycling of nutrients, maintenance of sufficient flow and water temperature).

Effectiveness

The extent to which actual outcomes are achieved, in terms of the planned outcomes, via relevant outputs, programs or administered expenses.

Effectiveness monitoring

Documents and tracks how well management responses to environmental stressors meet intended objectives. Monitoring contributes data to a weight of evidence relating management activities and responses to changes in conditions.

Environmental indicator

A measurable feature or features that provide managerially and scientifically useful evidence of environmental and ecosystem quality or reliable evidence of trends in quality.

Evaluation

A process of collecting project data and information, keeping records that are used to demonstrate performance, and comparing your achievements to your goals and desired outcomes. Outcome evaluation is often characterized by quantitative assessment methods. This can be done simply through recording and documenting activities, or in a more scientific approach through rigorous experimental design and analysis.

Goal

Goals are broad statements of ideal future conditions that are desired by society and represent the ultimate intention of agreed-upon actions and [targets](#). Goals can range from being explicitly quantitative to more qualitative and subjective, depending on the inherent degree to which the goal can be quantified and the availability of needed metrics. In most cases, goals are in the form of broad statements of ideal future conditions that are desired by society.

Habitat Restoration

Activities undertaken for the purpose restoring riparian, wetland and stream channel habitat that increase the beneficial use and contributes to improvement of water quality. Also see: [Restoration](#)

Hydrology

Dealing with the properties, distribution, and circulation of water on or below the earth's surface and in the atmosphere.

Impaired Waters List

A list that is compiled by the State Water Resources Control Board that identifies water bodies that fail to meet state water quality standards.

Implementation monitoring

Documents whether or not [management practices](#) were applied as designed. Project and contract administration is a part of implementation monitoring.

Indicator

A value that presents scientifically based information on the status of, and trends in, relevant metrics or parameters. An indicator conveys complex information in a concise, easily understood format, and has a significance extending beyond that directly associated with the metrics or parameters from which it is derived. Indicators are physical, chemical, biological, or socio-economic metrics (parameters) that represent the key elements of a complex system. Indicators simplify metrics, or data, into readily usable information that can be used to show trends or changes in a particular environmental or social condition.

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A composite of measures or indicators that can be used to track changes over time.

Load Reduction

An activity undertaken to achieve reduction in pollutant mass entering a water body or receiving water segment to achieve pollutant-specific numeric targets, with the ultimate intent to limit pollutant inputs to a level that the receiving water body can absorb or break down into harmless compounds faster than the rate of input. See also [**Total Maximum Daily Load**](#).

Management Measures

Actions taken to meet environmental protection goals.

Measurement Quality Objectives

Statements about the tolerated error and desired sensitivity of a measurement. They include extent of values for the measures of precision, accuracy, detection limit, and resolution. Monitoring Quality Objectives (MQOs) are a subset of [**Data Quality Objectives**](#) (DQOs).

Measurement Tools and Methods

Procedures and instruments used to quantify environmental, behavioral, or socio-economic characteristics and attributes.

Meta-data summaries

Information that describes the content, quality, condition, and other characteristics of data.

Metrics

Units of measurement (data) that can be collected, monitored, and interpreted to track the progress or effectiveness of a specific action in achieving a particular goal. Metrics and indicators are linked in that indicators simplify metrics into more readily usable and meaningful information. That is, an indicator points to the ultimate intention or goal that defines success. For example, if an ultimate goal is to double the average salmon escapement throughout the Central Valley, compared to the baseline period of 1967-1991, an indicator may be the total escapement of fall-run Chinook salmon in a given year, while a corresponding metric would be the number of fall-run Chinook salmon caught in the midwater trawl in that year's escapement period on a given stream.

Milestone

Benchmark used to determine status of the project and if it is meeting the project objectives during the implementation phase.

Model

A representation of a process or system that attempts to relate the most important variables in the system in such a way that analysis of the model leads to insights into the system.

Monitoring

Periodic or continuous collection of data (measured parameters) using consistent methods to determine the status (or condition) and trends of environmental or socio-economic characteristics.

Monitoring Plan

A course of action that defines what kind of data will be collected when and where, and the methods by which the data will be analyzed and interpreted to answer assessment questions related to project goals

Monitoring Program

A long-term, institutionalized effort to collect data for the purpose of determining conditions and trends of environmental or socio-economic characteristics.

Nutrients

Elements like nitrogen and phosphorus that are essential to healthy plant life, but in excess are detrimental to water quality.

Objectives

Objectives are statements of attainable, quantifiable, intermediate-term achievements that help accomplish goals contained in the comprehensive plan. Generally, objectives are more specific than **goals**.

Outcomes

Results, impacts or consequences of actions, or of goods or services produced.

Outputs

The goods and services produced by organizations.

Performance

The proficiency of an entity in acquiring resources economically and using those resources efficiently and effectively in achieving outcomes. The results of an investment's activity over time.

Performance measures

Information used to translate goals into measurable indicators of success. Performance measures are synonymous with indicators. They must track activities at multiple geographic scales and across different time frames, and must link individual and collective actions to specific environmental and institutional changes. Performance measure selection is based on having metrics as a basis for tracking and evaluating progress. There are several types of performance measures (or indicators):

- **Output Indicators**
 - Administrative output indicators track the administrative actions of a specific project (e.g., number of progress reports written, permits obtained).
 - Project output indicators track deliverables and intermediate milestones (e.g. number of workshop attendees, development of pollution prevention plan)

- **Outcome Indicators**
 - Site-specific indicators track the simple, direct responses of specific projects or groups of projects relative to a stated goal or target (e.g., reduction in toxic samples, increase in community awareness, acres restored to native vegetation).
 - Multi-site indicators track the collective responses of groups of projects on a locality or sub-region (e.g., reduction in nitrate concentrations in stream reach; increase in gravel permeability in stream reach; increase in watershed volunteers).
 - System-wide indicators track the broad, often complex responses of groups of projects on a region (increase in native riparian bird species diversity; increase in Chinook salmon escapement; decrease in statewide acreage of tamarisk infestations).

Performance assessment

The process of establishing performance measures, collecting and analyzing performance data, reviewing progress using the collected data, reporting on that progress, and periodically reevaluating project/program goals based on the evaluation of progress.

Planning

The act or process of getting from one set of circumstances to another using a proposed or intended method. Planning involves a thinking process to move from the present situation towards the achievement of one or more objectives or goals.

Physical parameters

Include general conditions such as temperature, flow, sediment characteristics, water color, and within-channel habitat structure.

Preservation (of field samples)

Using chemicals to "fix" samples in the field so that parameter concentrations don't change en route to the lab.

Project

A temporary endeavor undertaken to create a unique product or service. Temporary means that the project has an end date. Unique means that the project's end result is different than the results of other functions of the organization.

Proof of Concept

Successful demonstration of transforming an idea into a practical set of actions for broader application

Quality assurance/quality control (QA/QC)

A system of procedures, checks, audits, and corrective actions to ensure that all EPA research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

QAPP

Quality Assurance Project Plan – a documented course of action to insure that field, office, and laboratory measurements meet data quality objectives.

Remediation

Action taken to correct or treat a pollution problem.

Representativeness

A desirable quality for a monitoring sample site or station, which exhibits physical, chemical, and biological characteristics typical of the water body or medium being sampled.

Research

An active, diligent, and systematic process of inquiry in order to discover, interpret or revise facts, events, behaviors, or theories, or to make practical applications with the help of such facts, laws or theories. The term "research" is also used to describe the collection of information about a particular subject.

Restoration

Re-establishment of resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state.

Risk Assessment

A method for evaluating the likelihood of occurrence of an adverse effect as a result of exposure to one or more stressors.

Sediment

Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Target

A level of performance that is sought within a given time frame. A specific and measurable aim relating to an objective.

Total Maximum Daily Load (TMDL)

A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Water quality standards are set by States, Territories, and Tribes. They identify the uses for each waterbody, for example, drinking water supply, contact recreation (swimming), non-contact recreation (fishing, nature enjoyment) and aquatic life support, and the scientific criteria to support that use. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality (from federal Clean Water Act). Also see: Load Reduction.

Turbidity

A measure of water clarity. Turbidity, or cloudiness, can be caused by different sources of suspended particles in the water (e.g., suspended sediment or algae).

Toxicity

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction, immune system suppression, disruption of the endocrine system, or growth anomalies).

Validation monitoring

Determines if predictive model coefficients are adequately protecting the targeted resources. A long-term commitment to data collection is often required to establish an adequate data base.

Water quality assessment

The determination whether a water body is attaining its designated uses for such purposes as drinking, contact recreation, fisheries, and irrigation, based on state Water Quality Standards as provided for in the Clean Water Act of 1987. Also see: [Beneficial Use](#).

Water quality monitoring

An integrated activity for evaluating the physical, chemical, and biological characteristics of water in relation to human health, ecological conditions, and designated water uses.

Water quality standards

State-adopted and EPA-approved ambient standards for water bodies that prescribe the use of the water body and establish the water quality criteria that must be met to protect these uses. The three components of water quality standards include the beneficial designated use or uses of a water body (for example, drinking water supply, contact recreation (swimming), and aquatic life support), the numerical and narrative water-quality criteria that are necessary to protect the use or uses of that particular water body, and an antidegradation statement (from federal Clean Water Act).

Water resource quality

The condition of water or some water-related resource as measured by biological surveys, habitat-quality assessments, chemical-specific analyses of pollutants in water bodies, and toxicity tests; or, the condition of water or some water-related resource as measured by the following: habitat quality, energy dynamics, chemical quality, hydrological regime, and biotic factors.

Watershed

The geographical area which drains to a specified point on a watercourse, usually a confluence of streams or rivers (also known as drainage area, catchment, or river).

Watershed monitoring

Monitoring primarily designed to sample and assess the characteristics and/or condition of a watershed or watersheds, or to sample and assess specific entities on a watershed basis (i.e. as a geographic unit for sampling). For example, water quality monitoring conducted on a watershed basis would include monitoring physical, chemical, and biological condition of the water body as well as specific watershed characteristics (e.g., stream corridor traits, wetlands, and watershed land use/land cover patterns) that may be related to observed water quality.

Statistical Sampling Terms

Accuracy

The closeness of a measurement to the true value of the parameter measured.

Bias

A type of survey sampling error resulting from the sample not perfectly representing the population it is drawn from.

Estimation

The description of certain numerical characteristics of a population; the main method of inference used in sample surveys.

Index

A type of indicator derived from a set of aggregated or weighted indicators or measures.

Measure

Raw or analyzed data obtained from monitoring, surveys, and other valid data collection methods. Measures form the basis of indicators.

Parameter

A property, [feature, or characteristic] that is measured or observed.

Precision

The repeatability of a measurement.

Sample

A collection of sampling units drawn from a sampling frame.

Sampling design

All of the details concerning sampling units, sample selection, timing, spatial distribution and other issues involved in gaining sufficient sampling data for a monitoring and assessment program.

Sampling frame

A list of sampling units from which a subset (sample) can be drawn.

Sampling units

A non-overlapping set of measurements that covers an entire sampling population.

Trends

A trend is the consistent directional change in a population's characteristics documented by a minimum of three sampling events over a period of time (or sometimes distance); a change is a difference in a characteristic between just two sampling events.