Part 530 – Hydrology

Subpart A – Hydrologic Investigations

530.0 General

Hydrologic investigations and analyses are essential for determining the location, quantity, timing, and availability of water resources in the planning and design of water-related structures and projects and for project monitoring and evaluation. Hydrologic investigations and analyses rely on available hydrologic data, such as volumes and rates of stream flow; meteorological data, such as precipitation rates and amounts; and watershed characteristics. Collectively, these are referred to as hydrometeorological data. If existing hydrometeorological data are inadequate, the installation of instruments for the collection of data may be necessary.

530.1 Available Hydrometeorological Information

A. Use the most current existing hydrometeorological data for planning, design, and operation of water-related structures and systems. Hydrometeorological data sources include—

(1) NRCS National Water and Climate Center (NWCC).
(2) U.S. Geological Survey (USGS).
(3) National Oceanic and Atmospheric Administration (NOAA).
  (i) National Weather Service (NWS)
  (ii) National Centers for Environmental Information (NCEI), formerly the National Climatic Data Center (NCDC)
(4) Regional climate centers (RCCs).
(5) State climatologists.
(6) USDA sister agencies.
  (i) Agricultural Research Service (ARS)
  (ii) Forest Service (FS)
(7) Other Federal, State, and local agencies with planning responsibilities for water-related projects, operational responsibilities, or both.

B. Various watershed and floodplain reports found in the libraries of Federal agencies involved in study and report preparation sometimes also contain hydrometeorological data.

530.2 Hydrometeorological Instrumentation

A. Need for Hydrometeorological Instrumentation.—Hydrometeorological instrumentation is occasionally required for project planning, monitoring, and evaluation.

(1) Project Planning.—Consider hydrometeorological instrumentation in cases where existing data are inadequate for making reliable hydrologic estimates, particularly for projects that include storage for irrigation or other beneficial use and for which accurate estimates of available water supply are essential to project performance and justification.
(2) Monitoring and Evaluation.—Monitoring and evaluation are actions and activities used to measure the effectiveness of conservation practices and systems. The data are useful for model development, verification, or validation, and particularly modeling unmonitored areas.

B. Types of Hydrometeorological Instruments.—Hydrometeorological instruments include but are not limited to water stage recorders; devices for measuring snow depth and snow-water content; and

instruments for collecting precipitation, soil moisture, maximum and minimum temperatures, wind direction and speed, relative humidity, evaporation, and solar radiation data.

C. Planning and Installation of Hydrometeorological Instrumentation

(1) When instrumentation is necessary, develop a plan for collecting needed hydrometeorological data at the earliest possible time. Ensure the plan is consistent with project planning or project operation objectives. Include in the plan a statement of justification for the instrumentation; documentation of the type, quantities, and proposed location of required instruments; a schedule for installation; and anticipated operation and maintenance costs.
(2) Install instruments as soon as practical after planning begins and concurrently with other planning activities to ensure the longest possible record.
(3) Install temporary or permanent instruments, depending on their probable future usefulness. For planning purposes, instruments are usually as inexpensive as possible to keep planning costs to a minimum. However, if the intent is to use the sites for both planning and operation, select more sophisticated and durable equipment.
(4) When selecting sites, consider the potential for future installation of additional or more sophisticated instrumentation, or both.
(5) If needed, supplement project plans authorized for construction to include hydrometeorological instrumentation.
(6) In developing proposals that include hydrometeorological instrumentation, follow appropriate Federal guidelines to avoid duplication of effort and to ensure efficiency of the data collection system.

D. Operation and Maintenance of Hydrometeorological Instruments

(1) Projects that include hydrometeorological instrumentation for monitoring purposes require an appropriate operation and maintenance plan that includes appropriate considerations for NRCS and partner responsibilities, including the costs associated with the operation and maintenance of the instrumentation. Include funding for the operation and maintenance costs as part of the engineering services cost of the structure.
(2) Inspection and Followup.—Inspection and followup includes documenting, as necessary—
(i) Proper maintenance of hydrometeorological instruments to ensure collection of reliable data.
(ii) Collection and use of data in a timely manner according to the operating needs of the reservoir.
(iii) Updates to forecast procedures as additional data are collected to document improved forecast accuracy.
(iv) Operation of project features, including reservoir gates and other features regulating the storage or release of water for project purposes, in accordance with the operation and maintenance agreement.

530.3 Hydrologic Reports

A. Need for Hydrologic Reports.—Hydrologic reports provide—

(1) A record of investigations performed.
(2) Factors considered in selection of project alternatives.
(3) Information for future studies.
(4) A record of how a structure or system of structures operates under design conditions.

B. Types of Hydrologic Reports.—Reports include, but are not limited to—

(1) Site investigations for water supply storage.

(2) Effects of alternative systems of floodwater retarding structures on downstream discharges.
(3) Reports on unusual storm or flood discharges.
(4) Reports on field study of emergency spillway performance.
(5) Reservoir operation plans.
(6) Floodplain management and flood insurance reports.
(7) Dam breach and inundation studies for emergency action plans.
(8) Water budget analysis for wetland restoration, enhancement, and construction.

C. Review and Approval of Reports.—Ensure that the preparation, review, and approval of these reports and investigations are consistent with job approval authority.