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Mail Stop 415

OFFICE OF SURFACE WATER TECHNICAL MEMORANDUM NO. 2005.08

SUBJECT: Policy and Guidance for Archiving Electronic Discharge Measurement Data

Introduction

The purpose of the memorandum is to provide policy and guidance for archiving discharge measurement data collected with acoustic Doppler current profilers (ADCPs), acoustic Doppler velocimeters (ADVs), and with other types of electronic discharge measurement equipment. As electronic methods for collecting discharge measurement data are increasing, it is important that procedures be established for archiving these data.

U.S. Geological Survey (USGS) policy states that all original field notes, measurements, and observations shall be archived indefinitely (Hubbard, 1992). This is necessary because the original data may be needed for legal requirements, support for future research, or support of published data and reports. Although all electronic data should be stored in the USGS National Water Information System (NWIS), no capability for storing electronic discharge measurements in NWIS exists at present (2005).

Any electronic files created while making a discharge measurement, with any type of equipment, must be permanently archived, along with any paper field notes. These files include but are not limited to raw data, configuration information, moving-bed tests, instrument checks, calibration information, and discharge measurement notes. Procedures outlined in this memorandum are based on the assumption that every USGS Water Science Center (WSC) already has existing systems and procedures for performing routine backups for electronic information stored on WSC servers.

Every WSC must establish a documented system for collecting and storing electronic discharge measurement data. The procedures must include a consistent naming-convention for data files and directories. The following guidelines should be used to develop archival procedures for both field and office computers. These procedures must be documented in the WSCs Surface Water Quality-Assurance Plan.

Guidelines for Archiving Field Data

Care must be taken to ensure that irreplaceable data files collected in the field are permanently archived on a WSC server. Steps should be taken to prevent loss of data because of accidental

deletion, computer damage or failure, or files simply being lost or forgotten about because of poor file organization.

Field notes should document the names of all electronic files generated for a measurement. It is recommended that all files for each measurement be stored in one directory or folder on the field computer. It is up to each individual to organize and safeguard measurement data until it is permanently stored on WSC servers.

A temporary backup of all files collected as part of a discharge measurement must be made in the field on some kind of removable non-volatile data storage medium (CD-ROM, a USB flash drive, a PCMCIA flash card, etc.) and kept separately from the computer. A field backup is recommended after every discharge measurement. However, at a minimum, all data files collected during a day of field work must be temporarily backed up on some kind of removable non-volatile data storage medium at the end of each day during a field trip or permanently stored on a server as outlined in the Guidelines for Archiving Office Data section that follows.

Guidelines for Archiving Office Data

Each WSC collecting electronic discharge measurement data must have a written policy on permanent file archiving procedures. This policy should detail file and directory naming conventions, server directory structure, how soon data must be placed on the server after it is collected, and how, when, and where server data will be archived on stable archival media. This policy should be included in the WSC's Surface Water Quality-Assurance Plan.

Paper measurement notes associated with an electronic discharge measurement should be filed and archived with other paper discharge measurement notes in accordance with current USGS and WSC policies and procedures.

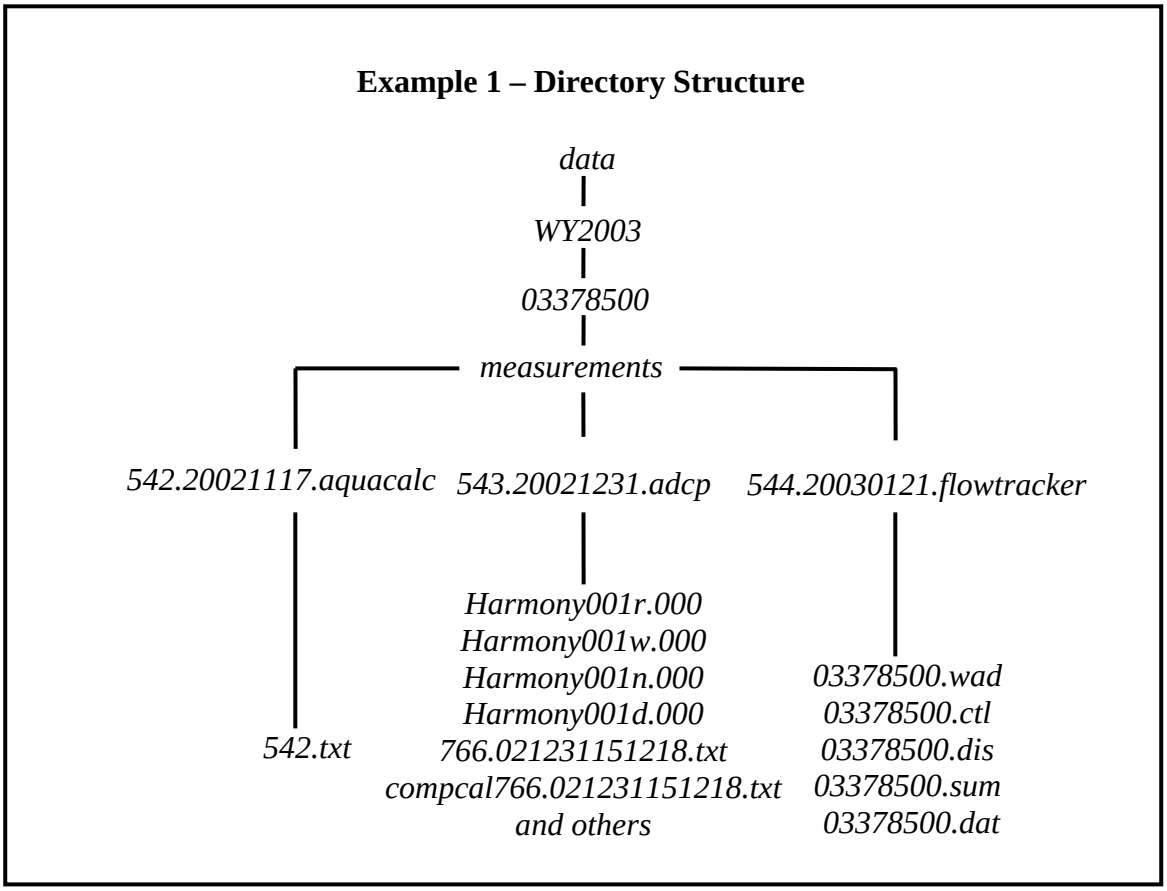
Each discharge measurement with multiple electronic data files should have its own directory, which contains all of the files collected or created as part of the measurement. The naming convention for the directories in the archival directory structure must include some combination of measurement dates, water years, and/or instrument types. Below are two examples of directory structures that meet these requirements. These examples are illustrated using three discharge measurements for USGS streamgaging station 03378500 and measurements made with a Price AA current meter and AquaCalc; an ADCP, and a Flowtracker.

Office Archival Directory Structure Example 1

The office archival directory structure example below uses dates and instrument types shown in table 1. In this example, the directory name includes the measurement number assigned to the measurement, the date of the measurement, and the instrument used.

Table 1.—Information for archiving discharge measurement data for example 1. [Relative path name for this example is: */data/WY2003/03378500/measurements/*]

Meas. No.	Date	Instrument	Directory name	Discharge measurement file(s)
542	11/17/2002	Price AA/ AquaCalc	542.20021117.aquacalc	1 AquaCalc measurement file: *542.txt*
543	12/31/2002	ADCP	543.20021231.adcp	All files for 1 ADCP measurement
544	01/21/2003	Flowtracker	544.20030121.flowtracker	All files for 1 Flow-tracker measurement

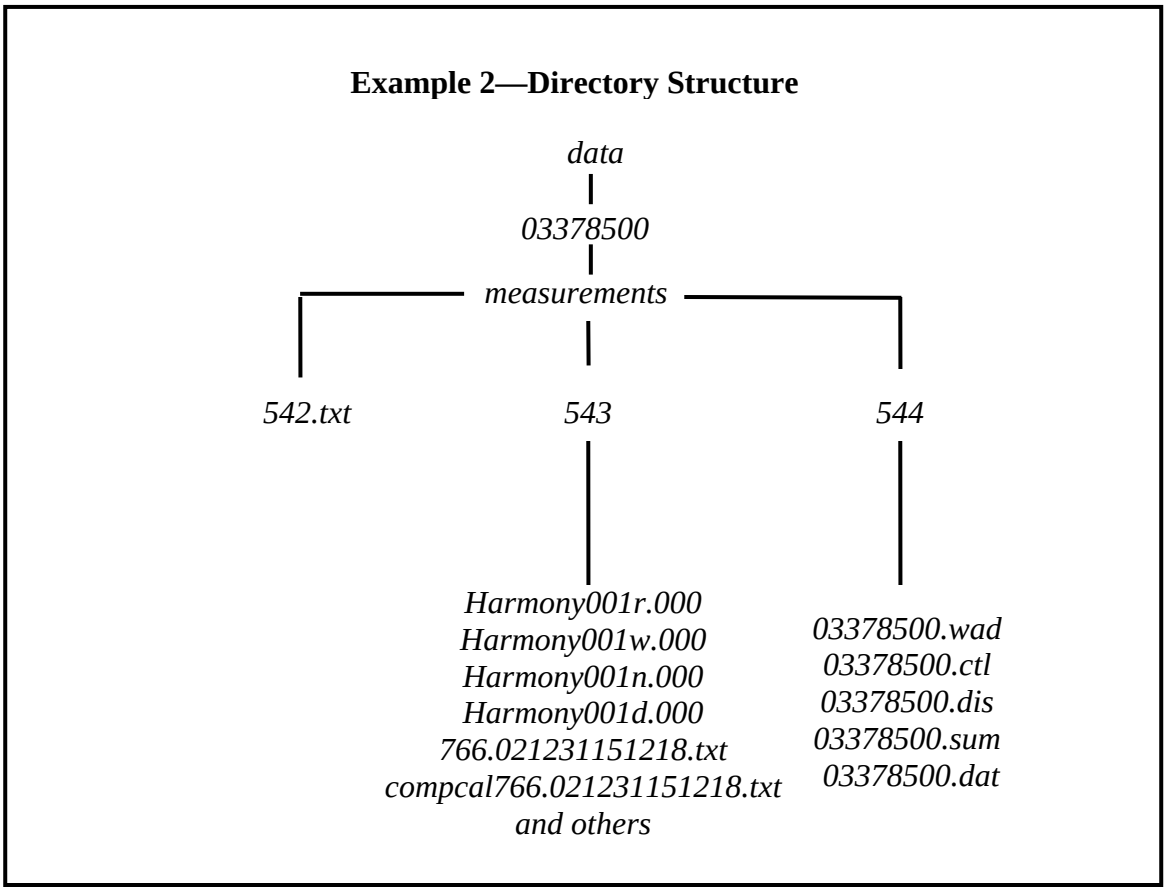


Office Archival Directory Structure Example 2

The office archival directory structure for example 2 is a simplified version of example 1. In this example, measurement dates and instrument types are not used in the directory names. Furthermore, since only 1 file is created for the AquaCalc measurement (number 542), no directory was created for that measurement.

Table 2.—Information for archiving discharge measurement data for example 2. [Relative path name for this example is: */data/03378500/measurements/*]

Meas. No.	Date	Instrument	Directory name	Discharge measurement file(s)
542	11/17/2002	Price AA/ AquaCalc	--	1 AquaCalc measurement file: *542.txt*
543	12/31/2002	ADCP	543	All files for 1 ADCP measurement
544	01/21/2003	Flowtracker	544	All files for 1 Flow-tracker measurement



It is recommended that data be transferred to the permanent storage directories on the WSC server within 2 work days of returning to the office. The WSC must provide a method to

efficiently transfer data from the field computers used to collect electronic discharge measurement data to WSC servers for archiving the data. Direct connection of the laptops to the local area network is recommended.

Provisions should be made to allow for processing of archived data with the software version that was used for data collection. Versions of the software used for processing measurements should be available within the same archival data structure used for storing the data. For example, if data were collected with *XYZ* software version 9.13, a copy of XYZ version 9.13 should also be archived. Because it cannot be ensured that the software will run on computer operating systems some years into the future, it is also essential that electronic discharge measurement summaries be saved in the ASCII format and printed out and archived with paper measurement notes.

All electronic discharge measurement data stored on WSC servers should be archived according to the standard WSC back-up procedures on stable archival media but should, at a minimum, be done annually. The directory structure of the data shall be preserved on the archival media. A minimum of two copies should be made and stored in different locations, with at least one located outside of the office. Examples of good archival media are CD-R, DVD-R and DVD+R. Re-writeable media such as CD-RW, DVD-RW and DVD+RW are not recommended. Archival media should be stored according to manufacturers' recommendations.

After the office archival directory structure has been established using the above guidelines, all electronic files created while making a discharge measurement must be stored using this directory structure. WSC's are also encouraged, but not required; to store electronic discharge measurement files collected prior the issuance of this memo in this same office archival directory.

If you have any questions or comments about the policies and guidance in this memo, please contact Kevin Oberg (kaoberg@usgs.gov) or the OSW Hydroacoustics Work Group (hawg@simon.er.usgs.gov).

References cited

Hubbard, E.F., 1992, Policy recommendations for management and retention of hydrologic data of the U.S. Geological Survey: U.S. Geological Survey Open-File Report 92-56, 32 p.

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