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# Appendix: IHFSDB Input Type

2006-11-03, Acrobat Distiller

## Overview

The National Weather Service (NWS) Integrated Hydrological System (IHFS) Database, or IHFSDB, is used by the NWS to support operational streamflow forecasting systems.

(Danny I think this is true) The design of IHFSDB reflects the influence of the Standard Hydrologic Exchange Format (SHEF), a text-based data exchange standard, in that data types are defined by “physical element” (PE) codes. The data read from the IHFSDB input type adhere to the data types in this database. Therefore, it may be necessary to translate data to other data types for various uses, as per the needs

IHFSDB is design for real-time data processing to support real-time forecasting. To improve performance, the data tables contain only a short recent period (4 weeks? Danny can you tell?). However, data are also archived in a similar database (Danny, I have heard about the “archive” database. I don’t know if has basically the same structure as what you have seen. Someone who wanted historical data would obviously need to point to this database, perhaps still called IHFSDB, or perhaps not).

## HydroBase and Standard Time Series Properties

The standard time series identifier format for IHFSDB time series is of the form:

Location.DataSource.DataType.Interval~HydroBase

Due to the variety of data types, sources, and formats in IHFSDB, time series properties (Danny – properties include the TSID parts and other information in the time series header) can be set a number of ways. General guidelines are as follows:

- The location part of the time series identifier is set to a station identifier, which is typically the identifier used by the managing agency, (or perhaps the “Handbook 5” identifier?). For example, USGS stream gages will use the 8-digit USGS identifier (can we give an example?).
- The source part of the time series identifier corresponds to the current source of the data. Is there such a thing in IHFSDB? If not, put in “NWS”.
- The data type part of the time series identifier is the data type used in IHFSDB, typically the PE code.
- Data intervals are set based on the tables that are being queried. Danny, hopefully this is either database driven in a field, or the table name or metadata indicates the interval. IrregularTS are handled somewhat differently so we should talk if you run into this.
- The scenario is not used. (Danny – unless they have variations, “contingency” or “what if” versions of time series.
- Units are set based on the database table definitions. (Danny – use units strings in IHFSDB if possible or see the *RiversideDB Dataunit* table, or *W:\program files\RTI\RiverTrak\System\DATAUNIT*).
- Period of record is set based on the available database contents. (Danny – this is REALLY important. If the DB does not have accurate start and end dates, for example because it is dynamic data that they don’t update, then you typically have to query and sort by date/time. Then use the date/time from the first and last records to set the information. The TS class has date1 and date1\_original. For an initial

read, both should be set to the same. Later, the TS may be processed and have its period extended or shortened.)

- Missing data are typically set to -999 in time series (Danny – I usually set the missing value indicator to that of the data. The TS code will support floating point values or NaN. Also, TS can optionally have data flags. To conserve memory, data flags are not automatically allocated. We use `char []` for this because having many String would dog the TS.)
- The input name is IHFSDB. If multiple HydroBase connections are needed, the input name may also be added (e.g., 12345678.USGS.QME.DAY~IHFSDB~DatabaseID), although this capability is only in the evaluation stage.
- The time scale for data (whether accumulated [ACCM], instantaneous [INST], or mean [MEAN]) is not automatically determined from the data type and interval. Users must understand the data that they are working with.

The following table presents a summary of time series identifier fields for the IHFSDB data types. Data types are listed by major group and are alphabetized by the data type description within the group. The time scale is provided to facilitate data use, in particular when changing the time interval.

#### IHFSDB Time Series Types and Standard Time Series Identifier Fields (Climate Data)

Data Group	Data Type Description	Location	Data Source	Data Type	Available Intervals and Time Scale	Comments
Climate						
	Precipitation	Station ID	NWS??	PP?	Hour, Day??	

### Limitations

IHFSDB has the following limitations related to time series storage:

- Any?