Hydstra Procedures
Quality Codes

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November 29, 2011

Hydstra has two sets of quality codes, one for time series data and another for gaugings and rating tables. You should only use the quality codes for the purposes that they are intended. The exception to this (and there always has to be an exception) are quality codes 1 (good data) and 70 (estimated data). These quality codes are used for all types of data.

Time Series Data

Data should come into Hydstra as "raw." Data should then be reviewed, and the quality code should be changed to the appropriate value.

Quality codes in Hydstra range from 1 to 255. Quality codes of 150 or greater indicate unusable measurements. Quality codes of less than 150 indicate usable measurements. By default, larger quality codes "trump" smaller values when data is transformed. So if there is a single measurement that has a quality code of 170, then daily, monthly and annual means will be calculated.

Importing Data

Imported data should be given a quality code of 140.

140 – Data not yet checked

Routines to import data from data loggers using HyGenMan will need to be changed.

Existing data imported from historical files or typed in should be given this quality code too, and reviewed.

Reviewing Data

Data should be reviewed by the person importing or entering the data. Generally, this should be done at the time data is imported into Hydstra.

Missing Data

Missing measurements should be given quality code:

151 – Data Missing

A comment should be added explaining why the data is missing. Extra points will be given for making additional comments in the History table.

There are two quality codes for special conditions when data is missing:

20 – Dry, no flow

85 - Flooded

Quality Code 201 should not be used.

201 – Data not Recorded

If this is used, it should be changed to Quality Code 151. Quality Code 201 will be eliminated.

Poor Data

Poor measurements should be given quality code:

170 – Unreliable data

Quality Code 170 should be used for all poor measurements, including measurements of unknown quality.

Quality Codes 40 – Fair Measurement and 120 – Poor Measurement are reserved for rating tables. Quality Codes 40 and 120 should not be used to qualify continuous or periodic data.

Quality Code 50 should not be used.

50 – Unknown measurement quality

If this is used, it should be changed to Quality Code 70 or 170. Quality Code 50 will be eliminated.

Estimated and Edited Data

Estimated measurements should be given quality code:

110 – Estimated flow calculations due to backwater influences

82 – Linear interpolation across data gap in records.

77 – Correlated with another station, same variable

76 – Reliable interpolation

70 – Estimated Data

2 – Good edited data

179 – Records partially estimated

A comment should be added explaining why the data is estimated and/or edited.

Quality code 70 should be used when the person collecting the data feels the estimate is reasonable and can be made available to the public. This quality code should also be used when none of the other estimated and edit data quality codes do not apply. Quality code 179 should be used when the person collecting the data in all other cases.

Quality Codes 79, 104 and 130 should not be used.

79 – Records partially estimated
104 – Records estimated
130 – Estimate

If either one of these are used, it should be changed to Quality Code 70. Quality Codes 79,104 and 130 will be eliminated.

Provisional Data

Provisional measurements should be given quality code:

15 – Provisional measurement

This quality code is used for surface water flow measurements that are reasonable, but cannot be fully validated until the end of the water year.

Good Data

Good measurements should be given quality code:

1 – Good data

Good data is good data. Issues of provisional and certified will not be addressed with quality codes.

Continuous and periodic data should not be given quality code of 10 – Good Measurement. This quality code is reserved for gaugings.

Historical Data

Historical measurements shall be given quality code:

26 – Data imported from historic records

Use the (STNINI, History or comments) to identify where the data came from.

Discrete Data

Gaugings

The following quality codes are (mostly) reserved only for gauging measurements:

10 – Good measurement
40 – Fair measurement
120 – Poor measurement

In addition, you can use
1 – Good data

According to USGS standards, an excellent gauging measurement is one that is within ±5% of the rating curve; a good gauging measurement is one that is within ±7% of the rating curve; a fair gauging measurement is one that is within ±10% of the rating curve; and a poor gauging measurement is one that is greater than ±10% of the rating curve. These should be given quality codes 1, 10, 40 and 120 respectively.

These quality codes should be assigned as part of certification.

Rating Tables

Rating tables should be given one of the codes:
30 – Irregular Time Rate Data – weekly/monthly read.
55 - Between highest and 2x highest measurement
60 - Above 2x highest measurement

150 - Inadequate gauging information, rating table extrapolated
160 – Above rating, no flow calculated
161 – Below rating, no flow calculated
185 – Flooded, no flow calculated
195 – Atypical station. Mean daily value only; no standard rating table

254 – Rating Table Exceeded

Quality Code 160 is for a low flow site, where the high flows are not important. Quality Code 161 is for high flow sites, where the low flows are not important. These comments should also be added to the History table.

Quality Code 254 should be used for a Stage-Discharge Site.

Quality Code 72 should not be used.
72 - Flow estimated at 1.4x highest measurement

If this is used, it should be changed to Quality Code 55 or 60. Quality Code 72 will be eliminated.

Other Discrete Measurements

Other discrete measurements are stored in the TTabPts table, and related tables. As of December 7, 2011, the following quality codes are used:

1 – Good data
2 – Good edited data
10 – Good measurement
40 – Fair measurement
50 – Unknown measurement quality
70 – Estimated Data
130 – Estimate
140 – Data not yet checked
151 – Data Missing

In the future, we should probably consolidate this list.

- Measurements using 140 should be changed to something else, or quality code 50.
- Measurements using 130 should be moved to 70.
- Measurements using 10 should be moved to quality code 1.
- There are also some measurements that have quality code 0. These measurements should be moved to quality code 50.

Other Quality Codes

71 – Manual Reading

Quality code 71 will be eliminated. If this is code is used, it should be changed to indicate the quality of the measurement, not how the measurement was taken.

73 – Minimum or maximum event from a partial record

Quality code 73 will be changed to minimum event from a partial record. We will establish a companion quality code, 74, for maximum event from a partial record.

74 – Maximum event from a partial record

80 – Accumulated

Quality code 80 is used for precipitation, and will be kept in case we start storing rainfall data in Hydstra.

81 – Wet day within accumulated rainfall period.

Table presents the different quality codes and the activities they can be used for.

Table . Quality Codes and Activities

Code	Text	GW Level	Water Quality	SW Stage	SW Flow	Rating Table Shifts	Rating Table
1	Good Data	X	X	X	X		X
2	Good Edited Data	X	X	X	X		
10	Good Measurement						X
15	Provisional Measurement				X		
20	Dry, no flow			X			
26	Data Imported from historic records						
30	Irregular data						X
40	Fair Measurement						X
55	Between highest and 2x highest measurements						X
60	Above 2x highest measurements						X
70	Estimated data	X	X	X			
73	Minimum event from partial record						
74	Maximum event from partial record						
76	Reliable interpolation (preserved when calculating aggregate numbers)	X	X	X	X		
77	Correlated with another station, same variable	X	X	X	X		
80	Accumulated						
81	Wet day within accumulated rainfall period						
82	Linear interpretation across data gap in records	X	X	X	X		
85	Flooded			X			
110	Estimated flow calculations due to backwater influences				X		
120	Poor measurement						X
140	Data not yet checked	X	X	X			

150	Inadequate gauging information, rating table extrapolated						X
151	Data missing	X	X	X			
160	Above rating, no flow calculated						X
161	Below rating, no flow calculated						X
170	Unreliable data	X	X	X			
179	Records partially estimated	X	X	X	X		
185	Flooded, no flow calculated						X
195	Atypical station. Mean daily value only, no standard rating table.						X
254	Rate table exceeded						X