In a network of high frequency monitoring stations, there are a lot of data and not all of it is useful. Sometimes, during very low tides, the hydrologic instruments are out of the water. Sometimes animals or winds leave debris in the rain gauge. Sometimes algae grow in dense films on the instruments and impact the readings. The list goes on and on.

On October 6, the HRECOS members signed a Quality Management Plan. This agreement outlines station maintenance and data review to define the quality of the HRECOS data. A copy of this signed agreement is available under "About Us" in the HRECOS menu to the left.

The first products of this quality assurance process are now available under "Historical Data" in the HRECOS menu. These data are in Excel tables for download. We hope, very soon, to provide a graphical interface that will allow you to view both raw and processed data.

Data processing does not mean data trimming. We never delete data. Instead we add flags to data that should be considered suspicious or that should be removed. These flags are added in two steps; the first set of flags are added automatically by a computer program and the second set are added by the site managers.

The automatic flags added are the numeric flags 1,3,4,5, and 6. The 1 flag indicates that the datum is outside the range of the instrument. The 3,4,5, and 6 flags are meant to highlight potentially suspicious data but can be added, erroneously, to acceptable data. The 3 and 4 flags mark data outside three or four standard deviations of the mean, 5 marks data spikes or dips and 6 marks flat lined data. These are primarily used by site managers to identify suspicious data. When examining data yourself that only has automatic flags, we advise excluding data flagged 1 but included all other data.

An additional 0 flag is added when the site manager has not written the quality assurance project plan. This plan includes site location and instrument meta-data as well as quality assurance procedures specific to this site. When completed, these documents will be available under "About Us" in the HRECOS menu.
The flags added by the site managers include A, S, and R for acceptable, suspicious, and remove. In addition, site managers add comments to justify why data should be considered suspicious or removed (a list of all the possible comment codes is given below and is also available in the HRECOS Quality Management Plan).

Not every site manager is able to review the data. Many people involved in this project are donating their time and instruments. For this reason, the HRECOS partners agreed to include multiple levels of data quality defined by the quality management plan. Data in levels A and B are reviewed by site managers where as those from levels C and D are not. The level of the data is marked clearly at the top of each table.

In summary, when reviewing level C or D data, remove all data flagged "1" to improve the quality; when reviewing level A or B, remove data flagged "R" and be wary of data flagged "S."

HRECOS Comment Codes:

------- Hydrological and Meteorological General Errors ------
[GIM] instrument malfunction
[GIT] instrument recording error, recovered telemetry data
[GMC] no instrument deployed due to maintenance/calibration
[GPF] power failure/low battery
[GQR] rejected due to QAQC checks
[GSM] See metadata
------- Hydrological ONLY General Errors ------
[GIC] no instrument deployed due to ice
[GNF] deployment tube clogged/no flow
[GOW] out of water event
------- Meteorological ONLY General Errors ------
[GMT] instrument maintenance
[GPD] power down
[GPR] program reload
------- Hydrological Sensor Errors ------
[SBO] blocked optic
[STF] catastrophic temperature sensor failure
[SCF] conductivity sensor failure
[SDF] depth port frozen
[SDP] DO membrane puncture
[SDO] DO suspect
[SIC] incorrect calibration/contaminated standard
[SNV] negative value
[SPC] post calibration out of range
[SSDN] sensor drift, record not corrected
[SSDC] sensor drift, record corrected
[SSM] sensor malfunction
[SOW] sensor out of water
[SSR] sensor removed (not deployed)
[STS] turbidity spike
[SWM] wiper malfunction/loss

---------- Meteorlogical Sensor Errors ----------
[SIC] Incorrect calibration constant, multiplier or offset
[SNV] Negative value
[SSN] not a number/unknown value
[SOC] Out of calibration
[SSM] Sensor malfunction
[SSR] Sensor removed

----- Hydrological Comment Codes -----
(CAF) acceptable calibration/accuracy error of sensor
(CBF) biofouling
(CCU) cause unknown
(CDA) DO hypoxia < 28 Percent Saturation
(CDB) disturbed bottom
(CDF) data appear to fit conditions
(CFK) fish kill
(CIP) surface ice present at sample station
(CLT) low tide
(CND) new deployment begins
(CRE) significant rain event
(CSM) see metadata
(CTS) turbidity spike
(CWD) data collected at wrong depth
(CAP) Depth sensor in water, affected by atmospheric pressure
(CAB) Algal Bloom
(CVT) possible vandalism/tampering
(CMC) in field maintenance/cleaning
(CMD) mud in probe guard

---------- Meteorlogical Comment Codes ----------
(CAF) acceptable calibration/accuracy error of sensor
(CDF) data appear to fit conditions
(CRE) Significant rain event
(CSM) See metadata
(CVT) possible vandalism/tampering