ECOHAB Sensor set up and variables measured

u and v components of velocity (Measured)
Units: *cm/sec*
Observation Category: *in situ*
Sampling Instrument: Teledyne RD Instruments 300kHz Workhorse Sentinel Acoustic Doppler Profiler (ADCP)
Sampling and Analyzing Method: On the surface moorings, E1, E2, E3, the ADCP was downward facing and set up to burst sample, averaging 190 pings measured once per second every hour. On the subsurface mooring, E4, the ADCP was upward facing and was set up to average 150 pings evenly sampled over 30 minutes. After editing in 2006 and 2007 the values at E4 were averaged to hourly values. In 2007 and 2008 they were not averaged to hourly values. All data was rotated to true North.
Data Quality Method: ADCPs measure water velocity at several depths, referred to as bins. Data was sampled in earth coordinates. Data was checked for u and v values of 9999s, indicating bad data. Values were linearly interpolated across the bad data. The ADCP collects ancillary data that was used to evaluate the data. If the percent good 4 beam solutions was <25, correlation magnitude was <64, or tilt was >15 degrees then the data was filled with a regression on the bin above it if the ADCP was downward facing. If the ADCP was upward facing, data would be filled with a regression on the bin below. U and v components were then plotted and visually inspected for spikes or spurious values and filled with a linear regression on the bin either above or below depending on whether the ADCP was facing upward or downward.

TEMPERATURE [WATER TEMPERATURE](Measured)
Units: degrees C
Observation Category: *in situ*
Sampling Instrument: Teledyne RD Instruments 300kHz Workhorse Sentinel Acoustic Doppler Profiler (ADCP)
Sampling and Analyzing Method: The ADCP contains a thermistor that measures temperature at the heads. The temperature is measured every time the instrument pings. On the surface moorings, E1, E2, E3, the ADCP was downward facing and set up to burst sample, averaging 190 pings measured once per second every hour. On the subsurface mooring, E4, the ADCP was upward facing and was set up to average 150 pings evenly sampled over 30 minutes. After editing in 2006 and 2007 the values at E4 were averaged to hourly values. In 2007 and 2008 they were not averaged to hourly values.
Data Quality Method: Temperature values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

TEMPERATURE [WATER TEMPERATURE](Measured)
Units: degrees C
Observation Category: *in situ*

Sampling Instrument: VEMCO minilog
Sampling and Analyzing Method: Vemco minilogs were set up to sample once every 30 minutes. After editing the values were averaged to hourly values.
Data Quality Method: Temperature values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

TEMPERATURE [WATER TEMPERATURE](Measured)
Units: degrees C
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 39 Temperature recorder (SBE 39)
Sampling and Analyzing Method: In 2003, 2005, and 2006 SBE 39s were set up to sample once every 30 minutes. In 2004 they were set up to sample once every 15 minutes. After editing the values were averaged to hourly values.
Data Quality Method: Temperature values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

TEMPERATURE [WATER TEMPERATURE](Measured)
Units: degrees T
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 37 MicroCat (C,T) recorder, (SBE 37)
Sampling and Analyzing Method: In 2003, 2005, and 2006 the SBE 37s were set up to average 4 samples taken every half hour. In 2004 the SBE 37s were set up to average 4 samples taken every 15 minutes. Salinity (PSU) and sigma-t (kg/m^3) were computed using measured temperature, conductivity and pressure if recorded, if not, a constant value equal to the depth was used. After editing the values were averaged to hourly values.
Data Quality Method: Temperature values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

Conductivity [water conductivity](Measured)
Units: Siemens per meter (S/m)
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 37 MicroCat (C,T) recorder, (SBE 37)
Sampling and Analyzing Method: In 2003, 2005, and 2006 the SBE 37s were set up to average 4 samples taken every half hour. In 2004 the SBE 37s were set up to average 4 samples taken every 15 minutes. Conductivity was converted to salinity (PSU) and sigma-t (kg/m^3) using the temperature and pressure data measured by the SBE 37. In most cases there wasn't a pressure measurement so a constant value equal to the depth was used. After editing the values were averaged to hourly values.
Data Quality Method: Conductivity, temperature, salinity and sigma-t values

were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

Pressure (Measured)
Units: pressure decibars (db)
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 37 MicroCat (C,T) recorder, (SBE 37)
Sampling and Analyzing Method: In 2003, 2005, and 2006 the SBE 37s were set up to average 4 samples taken every half hour. In 2004 the SBE 37s were set up to average 4 samples taken every 15 minutes. Pressure, if measured, was used to calculate salinity (PSU) and sigma-t (kg/m^3) using the temperature and conductivity data measured by the SBE 37. In most cases there wasn't a pressure measurement so a constant value equal to the depth was used. After editing the values were averaged to hourly values.
Data Quality Method: Conductivity, temperature, pressure, salinity and sigma-t values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

TEMPERATURE [WATER TEMPERATURE](Measured)
Units: degrees T
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 16*plus*, (SBE 16+)
Sampling and Analyzing Method: All instruments were set up to run the pump during sampling. The time delay before sampling varied. In 2003 the surface instruments were set to delay before sampling either 1 or 2 seconds. In 2004 and 2005 all surface instruments were set up to delay before sampling 1 second. In 2006 the delay before sampling was set to 4 seconds. In 2005 and 2006 the subsurface mooring at E4 was set up to delay before sampling 15 seconds. In 2007 and 2008 the subsurface mooring at E4 was set up to delay before sampling 20 seconds. In 2003 and 2006 the SBE 16+s on the surface moorings were set up to average 20 samples taken every half hour. In 2004 and 2005 the SBE 16+s on the surface moorings were set up to average 18 samples taken every 15 minutes. The subsurface mooring, E4, was set up to average 15 samples every half hour. After editing the values were averaged to hourly values except in 2007 and 2008 when the values were not averaged to hourly values.
Data Quality Method: Temperature values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

Conductivity [water conductivity](Measured)
Units: Siemens per meter (S/m)
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 16*plus*, (SBE 16+)
Sampling and Analyzing Method: All instruments were set up to run the pump during sampling. The time delay before sampling varied. In 2003 the surface

instruments were set to delay before sampling either 1 or 2 seconds. In 2004 and 2005 all surface instruments were set up to delay before sampling 1 second. In 2006 the delay before sampling was set to 4 seconds. In 2005 and 2006 the subsurface mooring at E4 was set up to delay before sampling 15 seconds. In 2007 and 2008 the subsurface mooring at E4 was set up to delay before sampling 20 seconds. In 2003 and 2006 the SBE 16+s on the surface moorings were set up to average 20 samples taken every half hour. In 2004 and 2005 the SBE 16+s on the surface moorings were set up to average 18 samples taken every 15 minutes. The subsurface mooring, E4, was set up to average 15 samples every half hour. Conductivity was converted to salinity (PSU) and sigma-t (kg/m^3) using the temperature and pressure data measured by the SBE 16+. In most cases there wasn't a pressure measurement so a constant value equal to the depth was used. After editing the values were averaged to hourly values except in 2007 and 2008 when the values were not averaged to hourly values.

Data Quality Method: Conductivity, temperature, salinity and sigma-t values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).

Pressure (Measured)
Units: pressure decibars (db)
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 16*plus*, (SBE 16+)
Sampling and Analyzing Method: All instruments were set up to run the pump during sampling. The time delay before sampling varied. In 2003 the surface instruments were set to delay before sampling either 1 or 2 seconds. In 2004 and 2005 all surface instruments were set up to delay before sampling 1 second. In 2006 the delay before sampling was set to 4 seconds. In 2005 and 2006 the subsurface mooring at E4 was set up to delay before sampling 15 seconds. In 2007 and 2008 the subsurface mooring at E4 was set up to delay before sampling 20 seconds. In 2003 and 2006 the SBE 16+s on the surface moorings were set up to average 20 samples taken every half hour. In 2004 and 2005 the SBE 16+s on the surface moorings were set up to average 18 samples taken every 15 minutes. The subsurface mooring, E4, was set up to average 15 samples every half hour. Pressure, (strain gauge) if measured, was used to calculate salinity (PSU) and sigma-t (kg/m^3) using the temperature and conductivity data measured by the SBE 16+. In most cases there wasn't a pressure measurement so a constant value equal to the depth was used. After editing the values were averaged to hourly values except in 2007 and 2008 when the values were not averaged to hourly values.
Data Quality Method: Conductivity, temperature, pressure, salinity and sigma-t values were plotted and visually inspected for spikes or spurious values.

Oxygen (Measured)
Units: dissolved oxygen (ml/l)
Observation Category: *in situ*
Sampling Instrument: Sea-Bird Electronics 16*plus*, (SBE 16+) with SBE 43 dissolved oxygen sensor

Sampling and Analyzing Method: Only the subsurface mooring, E4, had an oxygen sensor on the SBE16+. All instruments were set up to run the pump during sampling. The delay before sampling varied. In 2005 and 2006 the delay before sampling was set to 15 seconds. In 2007 and 2008 the delay before sampling was set to 20 seconds. The SBE16+ was set up to average 15 samples every half hour. After editing the values were averaged to hourly values except in 2007 and 2008 when the values were not averaged to hourly values.

Data Quality Method: Oxygen values were plotted and visually inspected for spikes or spurious values. Data deemed bad were filled using linear interpolation across the bad point(s).