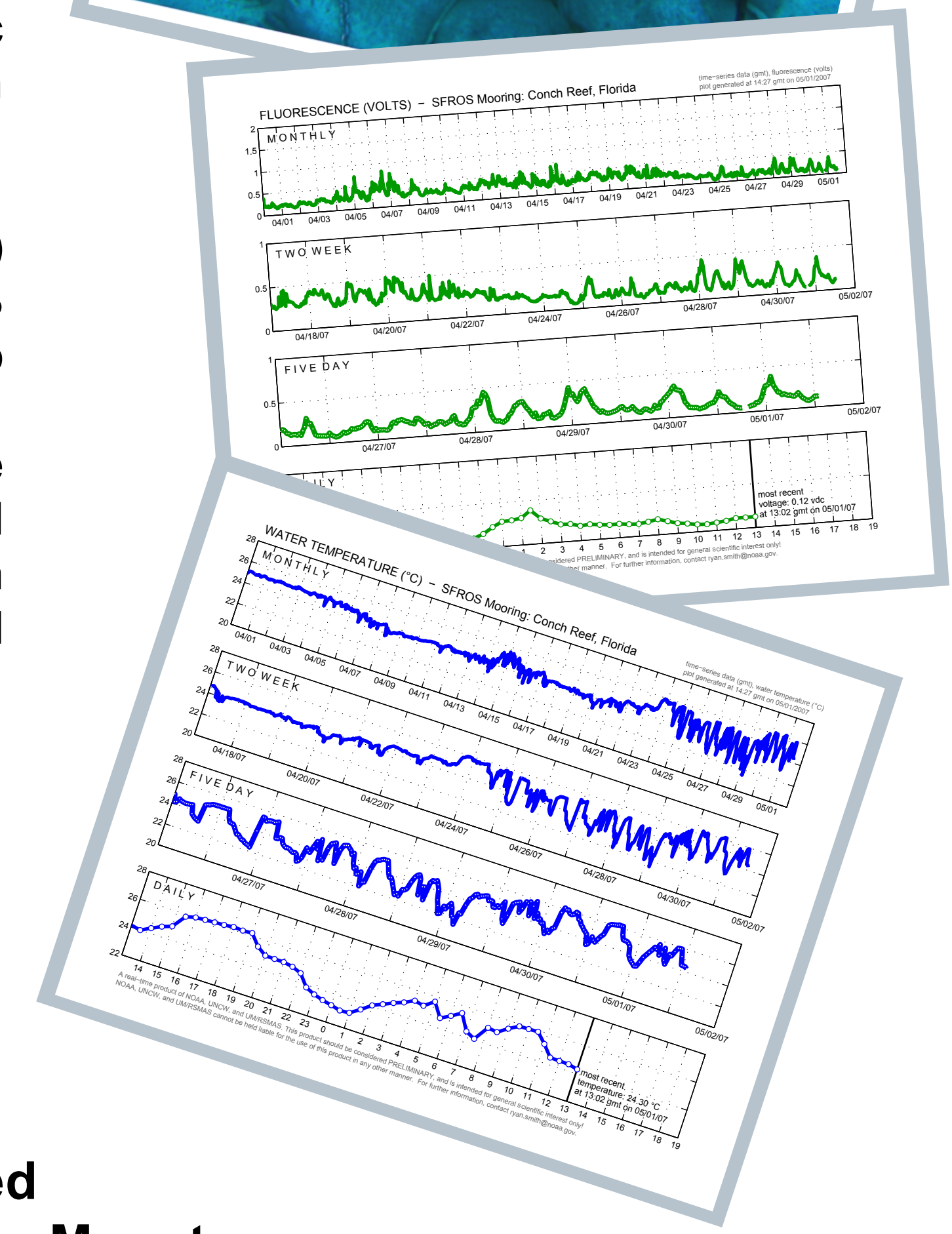
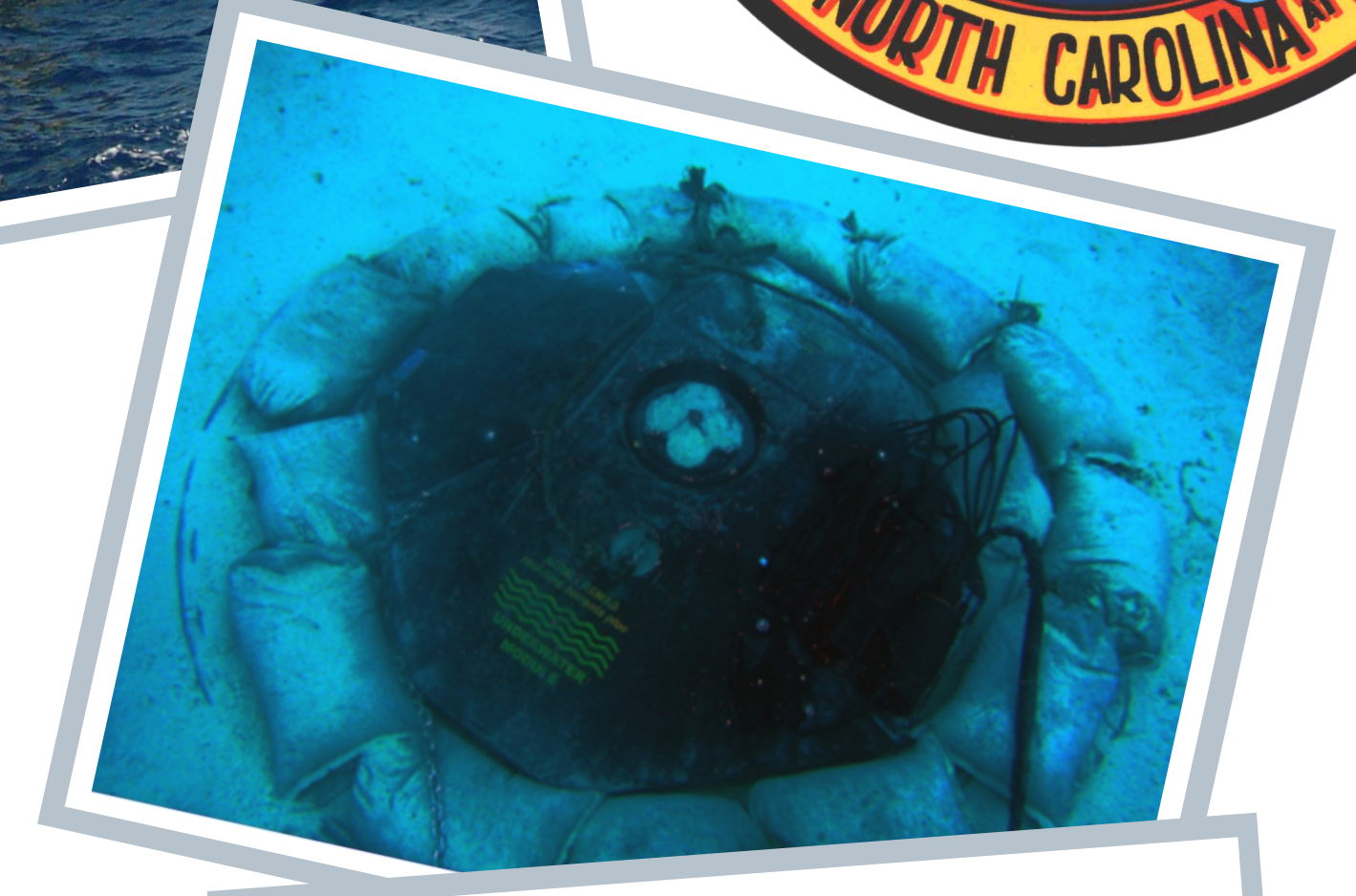
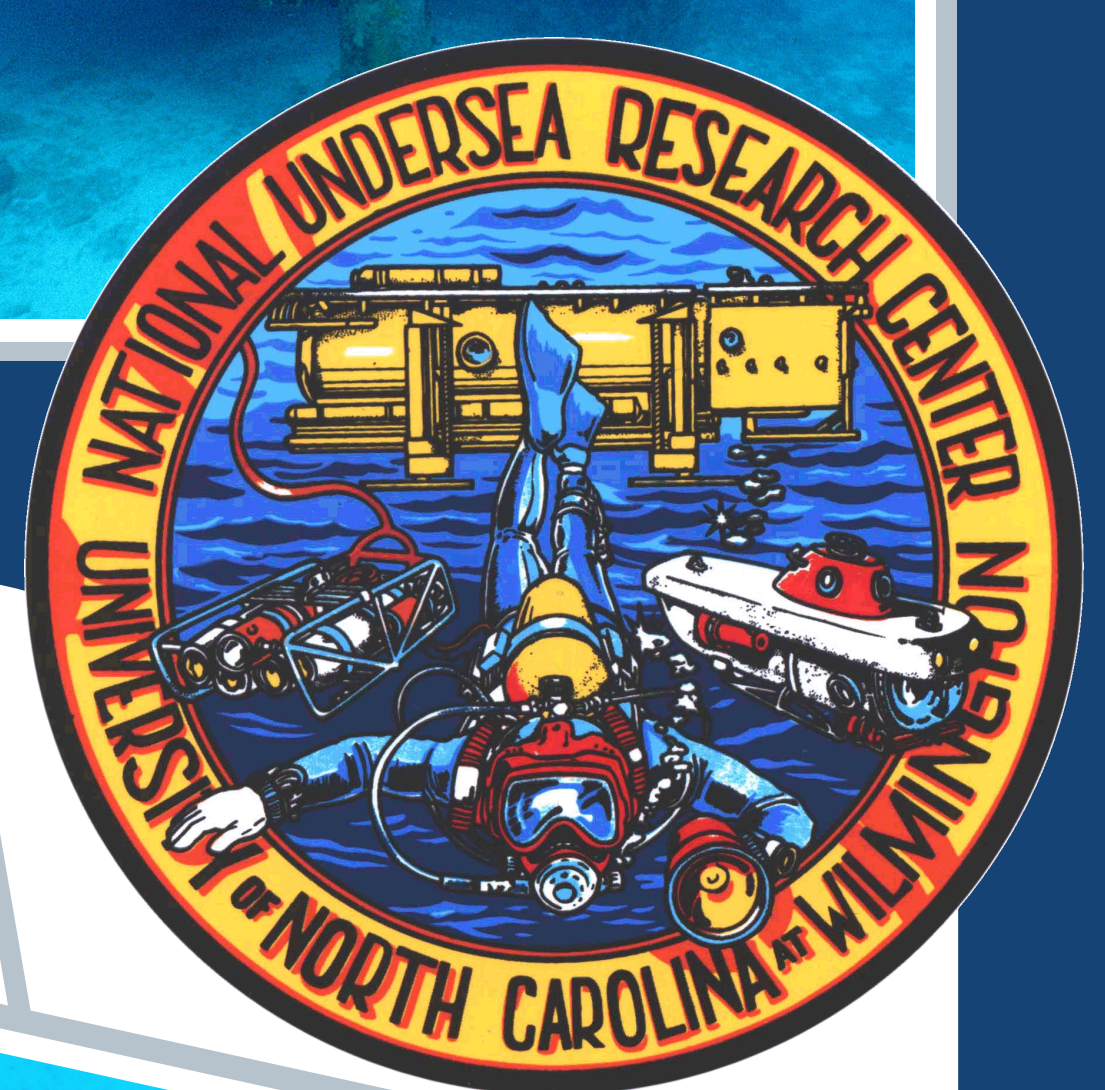
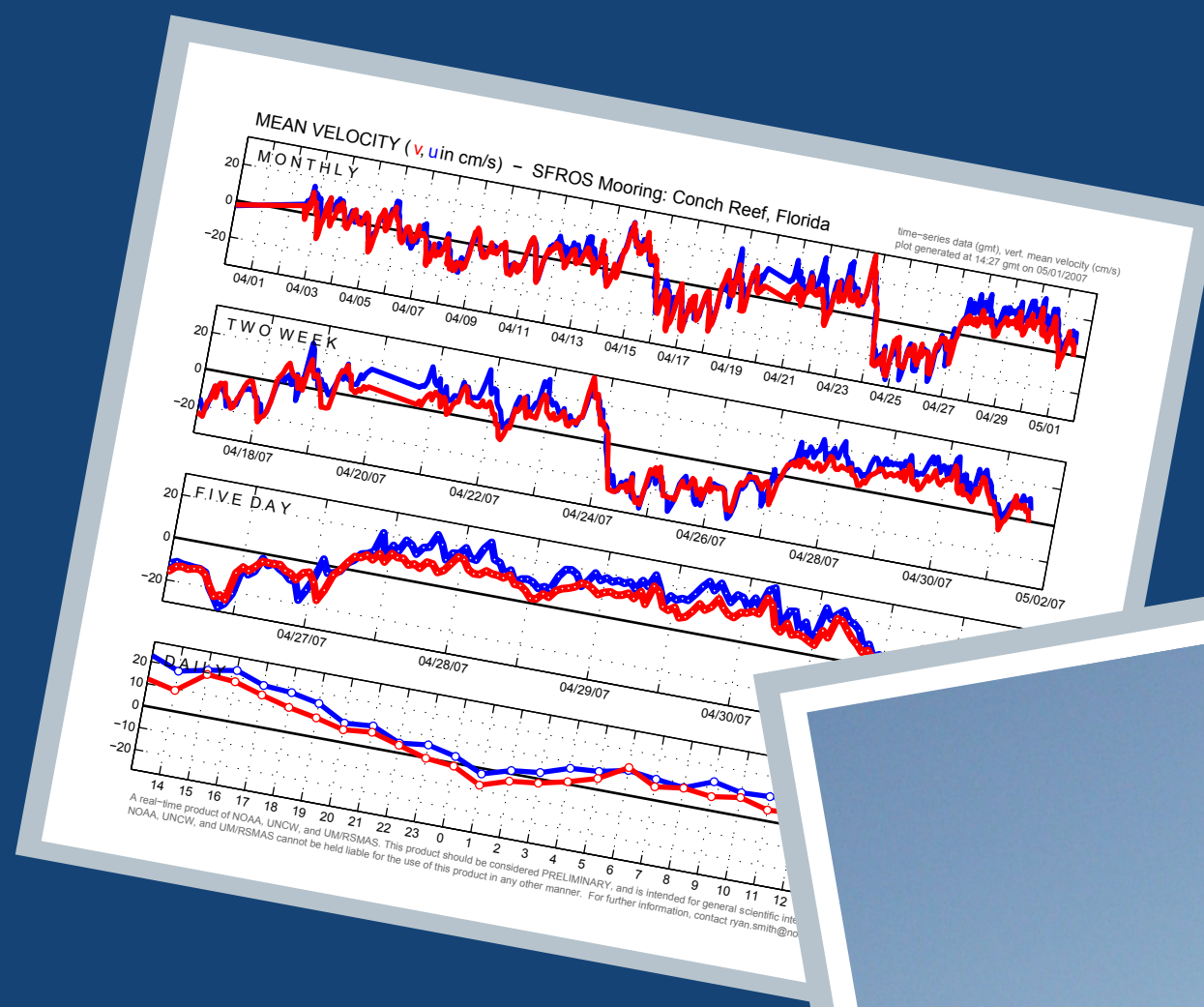


Conch Reef Oceanographic Station

at Aquarius Reef Base



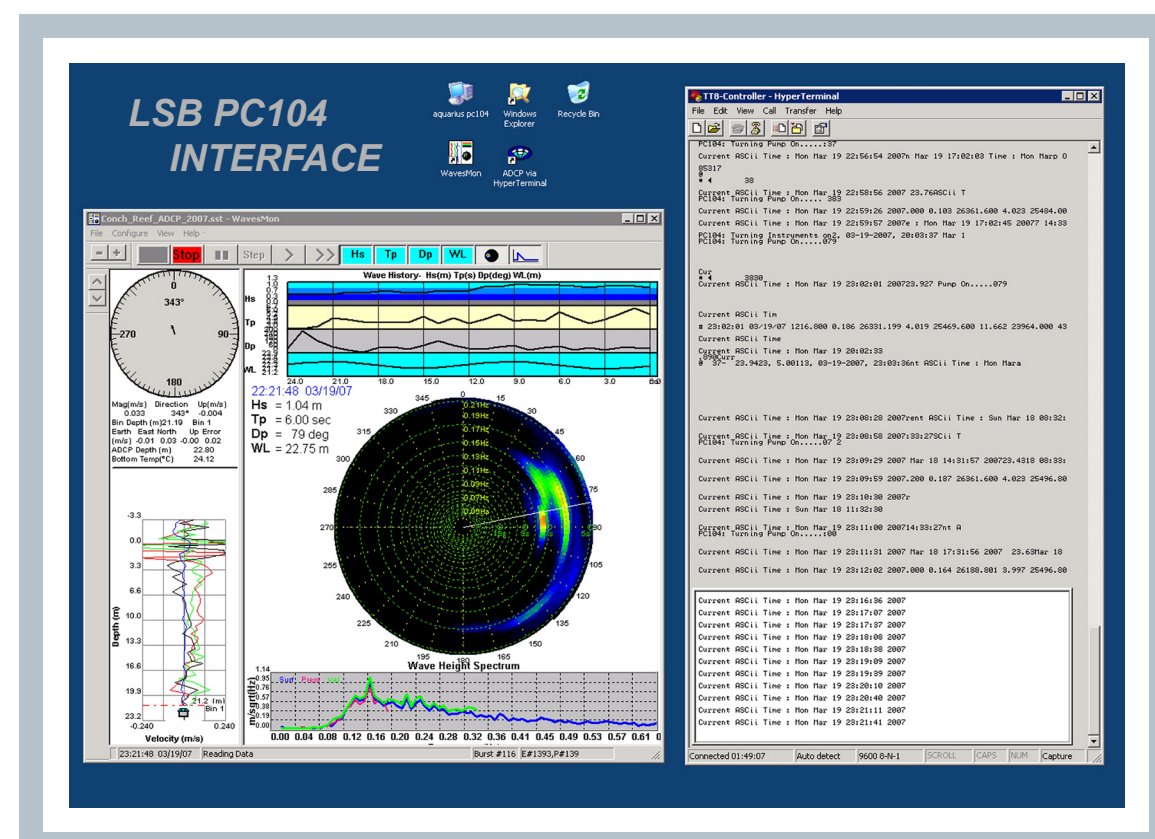
Real-Time Data, Real-Time Collaboration...

Conch Reef Oceanographic Monitoring Station is located at and a component of NOAA's undersea research laboratory, *Aquarius Reef Base*. The Reef Base's underwater habitat is deployed near Conch Reef in the Florida Keys National Marine Sanctuary (FKNMS); its shore base is located in Key Largo, Florida. Aquarius Reef Base is operated by a NOAA Undersea Research Program (NURP) Undersea Research Center (NURC) based at the University of North Carolina Wilmington (UNCW) in Wilmington, North Carolina.

The Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami and the University of Miami's Rosenstiel School of Marine and Atmospheric Science (RSMAS) in collaboration with NURP and UNCW are providing real-time data gathered from Conch Reef Oceanographic Monitoring Station to all interested parties. Presently, Conch Reef measurements include water velocity and directional waves data, along with water temperature, salinity, chlorophyll fluorescence, light transmittance (turbidity), and dissolved oxygen.

The monitoring station consists of the *Real-Time Currents plus* underwater sensor module located on the sea floor in 75 feet of water (22.8 meters) near the Aquarius habitat, and a computer controller located inside the Aquarius Life Support Buoy (LSB). The sensor module is connected to the LSB computer controller by means of a sea cable. AOML computers in Miami pull data from the LSB computer controller via the Reef Base's existing radio link at standard intervals. Directional waves and current observations are recorded hourly. Water quality measurements are collected every 30 minutes. These data are then formatted and posted to the station's website: <http://www.ConchReefData.net>. Conch Reef Oceanographic Station batteries are charged by a combination of sources. These include the Aquarius habitat's main diesel generator, a wind generator, and photovoltaic panels. The wind and solar inputs augment the primary generator. These redundant power sources ensure that the monitoring station and the wireless communication link to shore are in continuous operation regardless of habitat occupation. Descriptions of the station's instrumentation and components are provided below.

Station Instrumentation and Components...



Fiber-Reinforced Concrete Bottom Mount

Shown without instrumentation, the mount was built with instrument wells and fiberglass mounting plates for modular instrument configuration. The mount can be relocated as required by Aquarius Aquanauts via lifting points on its internal skeleton.

LSB PC-104 Computer Controller User Interface and Deck Unit

A windows interface and rack mounted system controls inside the LSB allow Aquarius personnel to easily monitor data collection and system status. This interface can also be accessed remotely from the shore base in Key Largo, or from AOML in Miami.

Aanderra Oxygen Optode 3830

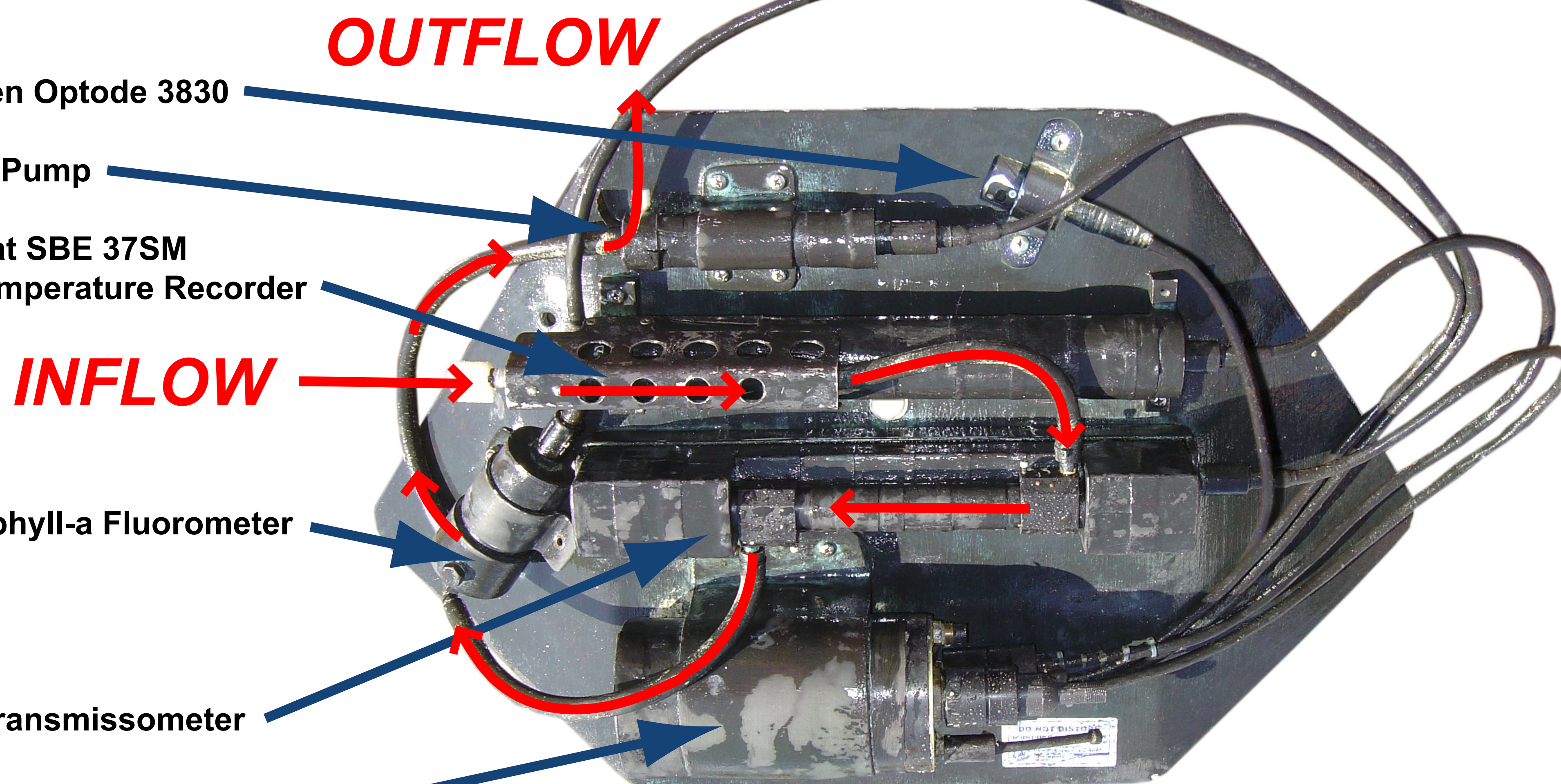
Sea-Bird SBE 5T Pump

Sea-Bird MicroCat SBE 37SM Conductivity / Temperature Recorder

SeaPoint Chlorophyll-a Fluorometer

Wetlabs C-Star Transmissometer

TT8 Analog/Serial Data Logger/Combiner



Real-Time Currents Plus Underwater Module Instrumentation Plate

Above, one of the underwater module's fiberglass mounting plates is populated with sensors. Instruments are shown in their present configuration. The sensor suite is plumbed with opaque tubing and pumped prior to sampling to deter biofouling and minimize settling of inorganic sediments. Data from each instrument are combined, logged, and sent to the LSB computer controller through the sea cable by the TT8 housed in the pressure case located on the bottom of the plate. Red arrows indicate flow direction. Blue arrows identify instruments. Presently, the following water quality measurements are being served to the public at 30 minute intervals:

- Temperature
- Salinity
- Fluorescence
- Transmittance
- Dissolved Oxygen Concentration and % Saturation



Teledyne RD Instruments 600kHz Acoustic Doppler Current Profiler (ADCP) with Directional Waves

Shown outside of the bottom mount, the ADCP is the acoustic component of the *Real-Time Currents plus* underwater module. Though this instrument is mounted on the sea floor, it provides water velocity data for the entire water column. The ADCP also provides information about the directional wave spectrum at the site. Presently, the following hourly ADCP measurements are being served to the public:

- Significant and Maximum Wave Height
- Peak Wave Period and Direction
- Mean Wave Period
- Current Velocity
- Water Depth

The time-series data collected at Conch Reef, along with other regional mooring and ship track data, contribute to the South Florida Regional Observing System (SF-ROS) being implemented by NOAA/AOML in support of South Florida Everglades Restoration and NOAA legislative regional mandates with regard to living marine resource protection and the FKNMS. The integrated SF-ROS system consists of these observations and a regional hydrodynamic model (SoFla HYCOM) which will assimilate these data.

www.ConchReefData.net

