Horizontal and Vertical Control Report

2018 Summer Hydrographic Field Course

CCOM UNH

Project Metadata

Project Name	Summer Hydro 2018
Project Number	SH2018
General Locality	Gulf of Maine
State or Territory	Maine
Field Unit	CCOM/JHC
Project Start Date	06/20/2018
Project End Date	07/03/2018
Field Year	2018
DAPR Version	SH2018

Position and Height Information Utilized for Project

Horizontal Datum	World Geodetic System 1984
Realization	WGS84 1150
Ellipsoid	GRS80

Final Products:

Horizontal Datum	WGS84
Projection:	WSG84 UTM19N
Vertical Datum:	MLLW

Non User Installed Base Stations

CORS NHUN for post processing of SBETs

CORS Station			
Station ID	**Position (ITRF2014 Epoch 2010)**		**(ITRF2014 Epoch 2010)**
NHUN	Latitude	Longitude	
DI1075	43.14255948	70.9519097	Adjusted 6/2019 7.923m
	43.14255929	70.9519087	7.923m

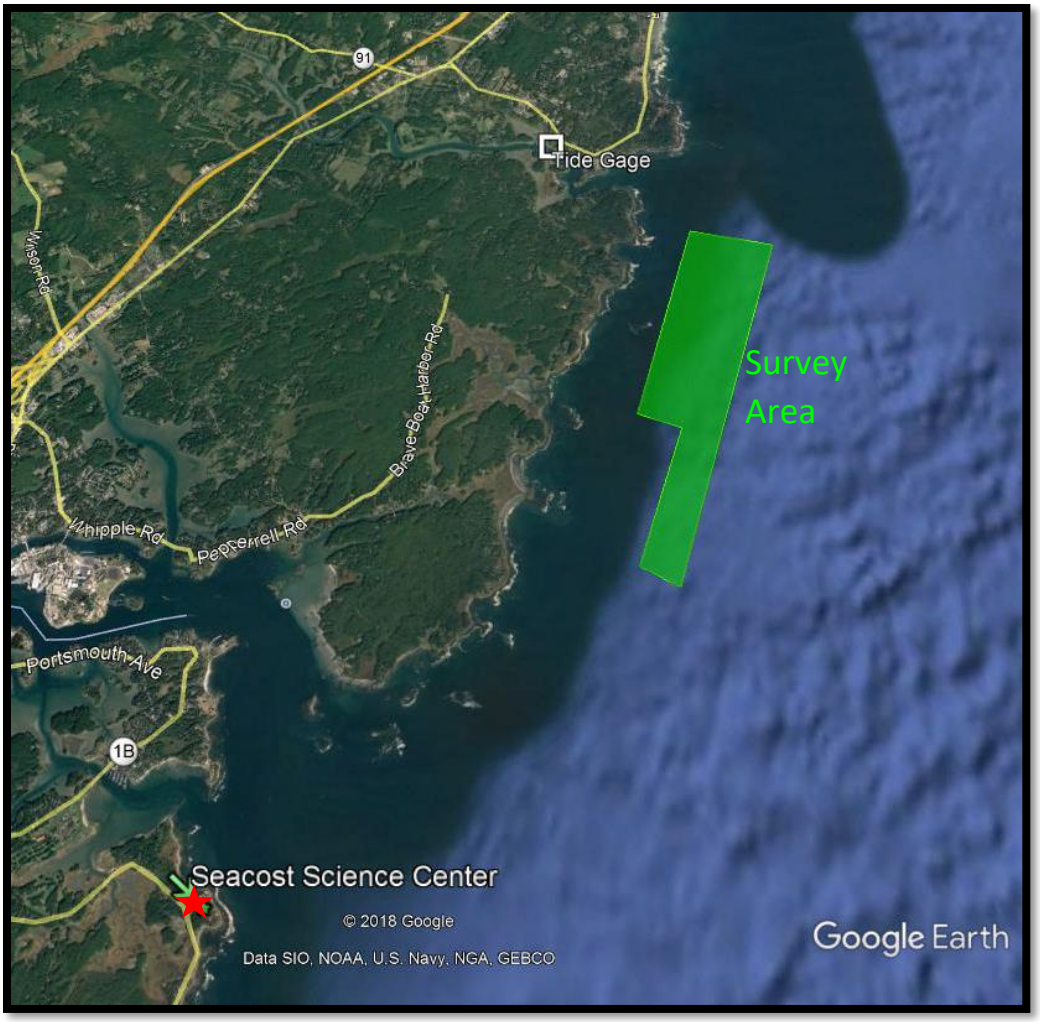


Figure 1. Horizontal and Vertical Control Stations for the Survey Area.

User Installed Base Stations

CORS Station			
Station ID	**Position (IGS08)**		**Ellipsoid Height (IGS08 Epoch 2014.6809)**
UNH_SCIC WGS84	Latitude 43.0453851	Longitude 70.71381611	15.884 m
Antenna: Zephyr Geodetic			

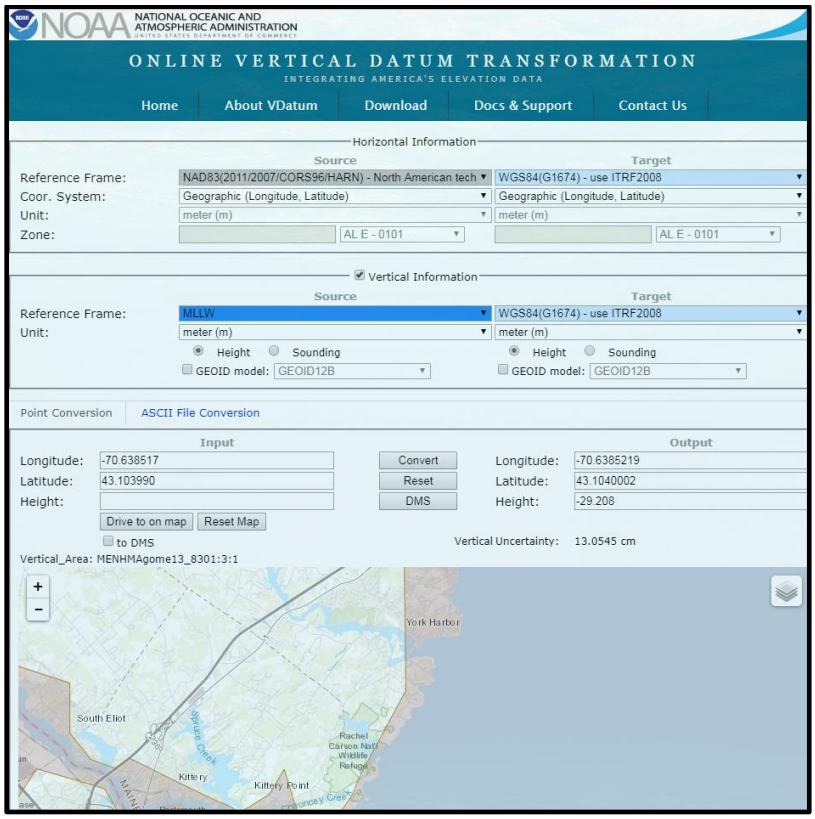
Figure 2.Instrumentation of the RTK Base Station at the Seacoast Science Center, Odiorne Park, Rye, NH.

Vertical Techniques

Through RTK GNSS correction via UHF radio signals using CMR+ format with a baud rate of 4800 bps were corrected and calculated the elevation during the survey. The vertical reference during acquisition was the ellipsoid WGS84. The use of RTK GNSS methods of surveying to the ellipsoid accounts for the settlement and squat of the vessel, so these values were not measured.

Motion and position data were post processed using POSPac using the University of New Hampshire (UNH) Continuously Operating Reference Station (CORS) NHUN.

The survey was referenced to WGS84 during collection. Tides model were not required, as a static offset value from VDatum was used to convert from the ellipsoid to MLLW. A vertical offset of -29.208m was applied to the acquired data in Qimera. This offset was calculated using NOAA's online VDatum program, with a source year of 2016 and a target year of 2018 (see Figure 6, below). Since the survey fell within one tide zone, NA169, the offset did not vary significantly within the region.



Vertical offset as calculated from VDatum online (2016 to 2018).

Horizontal Techniques

The latitude and longitude were referenced to the ellipsoid WGS84 with the same RTK GNSS corrections as described under Vertical Techniques. (A Trimble RTK base station/rover pair was utilized for positioning corrections for the entirety of the survey. Corrections were broadcast from the Seacoast Science Center in Rye, NH.) Data was post-processed in POSPac, thus final products are referenced to the base stations of the POSPac solution.

Discussion

Horizontal and Vertical position was collected with reference to the ellipsoid WGS84. The RTK Base Station at the Seacoast Science Center was the primary horizontal control were calculated the Vertical and Horizontal Control for all the data during acquisition. The RVGS is equipped with Trimble Trimmark 3 which is part of the base station at the Seacoast center with a Trimble TDL 450 L radio and a Trimble 5700 GPS receiver. Data was post-processed in POSPac. In this case, NHUN was the primary base station used as a reference in post-processing.