# Launch of Joint CODAR/NOAA Program for HF Tsunami Warning

S tarting July 2016 CODAR Ocean Sensors, Ltd. is under contracted partnership to refine SeaSonde HF radar outputs that will provide useful warnings of approaching tsunamis off U.S. coasts. Directed out of the Tsunami Warning Center (TWC) in Palmer, Alaska, and co-sponsored by U.S. NOAA/National Weather Service (NWS) Tsunami Program Office's Tsunami Research Advisory Council (TRAC) and NOAA/NOS U.S. IOOS, the specific aim is to optimize detection while reducing false alarms.

CODAR has in past years created and published details on a "q-factor" tsunami pattern recognition algorithm that successfully detected offline over 26 times confirmed events of both seismic and atmospheric origin (the latter known as 'meteo-tsunamis'). Under this new program CODAR's q-factor detection algorithm will be installed and run in in real-time on four SeaSondes operating in New Jersey, correlating false alarms with external influencers such as background currents, radio interference and noise.

Program will geographically focus on measurement sites in New Jersey for the following reasons: (a) Recent metro-tsunamis were observed there (e.g., 2013), and the shallow shelf has allowed long SeaSonde warning times (43 minutes). (b) Group can take advantage of a long-standing partnership between CODAR and Rutgers, who oversees the maintenance of MARACOOS' SeaSondes (43 of them).

These will operate in a "simulator mode", first collecting false alarm data. Then simulated "test tsunami" signals obtained from CODAR's tsunami model (based on the local bathymetry) will be injected into the data stream, to optimize detection probability. Near-real-time ASCII files of q-factor spikes from the four New Jersey radars will be sent to the TWC in Palmer, AK, as well as to Rutgers and CODAR. This will allow feedback from TWC to improve CODAR algorithm and NOAA decision thresholding. It will also permit site- specific performance assessment, based on local background, bathymetry, and tsunami intensity.
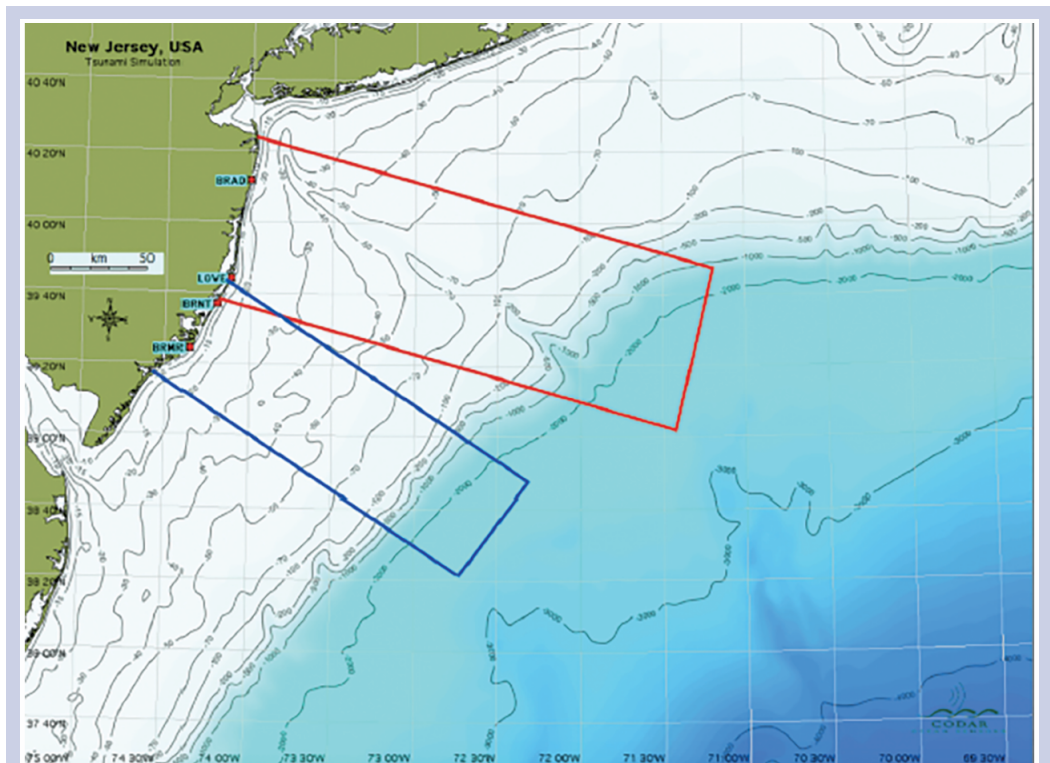
Bay New Jersey coast region selected for tsunami optimization/simulation study. Four MARACOOS radar sites running q-factor pattern-recognition are (from North) BRAD, LOVE, BRNT, and BRMR. The two domains marked by the rectangles are where incoming tsunamis will be modeled. Like the 2013 meteo-tsunami, the wave will initially start inward from the box edge at the far East, in deep water (>2000 m). Model outputs are based on initial tsunami velocity (and height) intensities. These will be set to study detectability and false alarm rate sensitivity, based on bathymetry and background masking.