



Seminar Announcement

Sponsored by:

NMFS/NEFSC, CINAR, and the
Woods Hole Oceanographic Institution ~ AOP&E Department
Wednesday April 27, 2016
12:15pm

WHOI-NEFSC Special Seminar Series on Fisheries and Ecosystem Acoustics
Resonance classification of swimbladder-bearing fish using broadband acoustics: 1-6 kHz

Tim Stanton, Scientist Emeritus Applied Ocean Physics & Engineering WHOI

To be held at: NEFSC Stephen H. Clark Conference Room, NOAA Aquarium Building

ABSTRACT

Broadband acoustics is an emerging technology in the use of echosounders to study distributions of fish. In a collaboration between the Woods Hole Oceanographic Institution (WHOI), NOAA Northeast Fisheries Science Center (NEFSC), and U.S. Naval Research Laboratory (NRL), we have developed new broadband acoustic techniques to classify swimbladder-bearing fish through the resonance properties of their swimbladders. The resonances for common sizes of fish normally occur in the 100's Hz to low kHz frequencies. There are distinct advantages of this approach over use of the higher frequency systems, including 1) the ability to spectrally resolve the resonances from dominant size classes of mixed assemblages of fish even when the echoes are not spatially resolved and 2) the ability to classify fish echoes through their resonances at (horizontal) distances as great as 20 km even in the presence of reverberation from the seafloor and sea surface. These advantages and others are illustrated in this presentation of our studies in the Gulf of Maine where we deployed a combination of technologies: short-range downward-looking broadband echosounder (1-6 kHz), long-range horizontal-looking broadband sonar (1.5-5 kHz), high frequency narrowband echosounders, and pelagic trawls.

ABOUT THE SPEAKER:

Dr. Tim Stanton has been conducting research in underwater acoustics for more than 40 years. After receiving his Ph.D. in Physics at Brown University, he worked at Raytheon Company, Portsmouth, RI where he developed advanced sonar systems. After that, he transitioned to acoustical oceanography, first at the University of Wisconsin and then at WHOI where he is currently a scientist. While the overall theme of his research has been scattering physics, he has been developing broadband acoustics techniques for bioacoustics applications for more than 25 years, beginning with laboratory studies of acoustic scattering by fish and zooplankton and, more recently, using broadband sound to study fish in the Gulf of Maine. He has long-term collaborations with scientists from NOAA Fisheries dating back to 1985 with Dr. Mike Jech (now at NOAA Northeast Fisheries Science Center) and 1987 with Dr. Dezhong Chu (now at NOAA Northwest Fisheries Science Center). Dr. Stanton is a recipient of the A.B. Wood Medal, is a Fellow of the Acoustical Society of America, and taught in the MIT/WHOI joint graduate education program and Friday Harbor Laboratories for 20 years. Stanton has also been Associate Editor or Guest Editor of three scientific journals (J. Acoustical Society of America, IEEE J. Ocean Engineering, and Deep Sea Research) and has been Chair or Co-Chair of two scientific conferences (meetings of The Oceanography Society and Oceanology International). Stanton's website: www.whoi.edu/people/tstanton