

# **JONATHAN E. KOONS**

**Ocean and Resources Engineering  
M.S. PLAN B  
PRESENTATION & DEFENSE  
THURSDAY, DECEMBER 10, 2015  
HOLMES HALL 400  
1:30 PM (seating limited)**

## **Mooring Procedures and Use of High Modulus Synthetic Fiber Lines in the United States Navy**

**High Modulus Synthetic Fiber (HMSF) mooring lines have been replacing traditional steel, polyester and nylon lines in the United States Navy and in industry because they are stronger, lighter and reduce the amount of time necessary to moor the vessel.**

**Their low elasticity reduces the risk of dangerous recoiling upon failure, but the low elasticity of the HMSF lines has been suspected of causing bollards to be sheared off of piers in the Navy. This study reviews mooring design guidelines and mooring procedures used by the United States Navy, HMSF line specifications, manufacturer recommendations, and industry guidelines and practices. This study has found that nylon and polyester pendants are used in industry in conjunction with HMSF lines and can be applied to most Naval mooring practices. The use of pendants to connect the HMSF lines to the bollards can provide elasticity and reduce damage to the system.**