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Woods Hole Oceanographic Institution

\*\*\*\* *Special* Biology Department Seminar\*\*\*\*

**Co-sponsored with Marine Mammal Center**

**Friday November 16, 2012**

\*\*\*Redfield Auditorium – 2 p.m.\*\*\*

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**A Whale's Tale: chemical profiles  
provide first glimpse into the life of a  
blue whale**

**Dr. Stephen J. Trumble**

**Integrative Physiologist, Baylor University**

A technique combining aging with a novel analytical approach was used to reconstruct chemical profiles from an individual male blue whale earplug. This technique produced lifetime profiles for many lipophilic chemicals, including persistent organic pollutants, mercury, and hormones, ultimately resulting in unprecedented data regarding contaminant uptake and hormone production for this species. Cortisol levels doubled over the lifespan of the blue whale, while testosterone concentrations spiked (100X) at approximately ten years of age. Temporal variability in hormone production and contaminant exposure was reconstructed and age of sexual maturity was chemically verified for the first time. Organic contaminants including DDTs, PCBs and PBDEs were recovered from all lamina with increased concentrations in lamina representing 0-12 months of age. This indicates transfer of contaminants from mother to calf. Whale earplugs provide an invaluable record of cortisol production (stress) and environmental exposure to contaminants that is not attainable using other approaches.