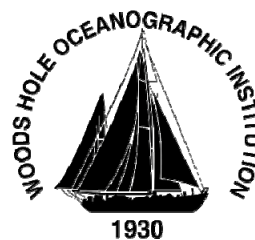


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Woods Hole Oceanographic Institution  
**Biology Department Seminar**



Thursday, January 16, 2014  
Redfield Auditorium – 12:00 Noon

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**Age, movements and feeding ecology of  
northwest Atlantic white sharks estimated  
from ecogeochemical profiles in vertebrae**

**Ms. Li Ling Hamady**

**Ph.D. Candidate, Biological Oceanography,  
MIT/WHOI Joint Graduate Program**

White sharks (*Carcharodon carcharias*) are highly migratory, ecologically important, vulnerable, and understudied marine top predators. Ecogeochemistry, which takes advantage of natural variations in chemical signatures recorded in body tissues, can help determine lifetime movement, age, and ontogenetic diet history in difficult to study species. Shark vertebrae are constructed of distinct layers of tissue laid down sequentially over an individual's lifetime and may preserve a chemical record of environmental exposure. In this thesis, I investigate the ecology of the understudied northwest Atlantic (NWA) white shark population by applying several ecogeochemistry techniques to their vertebrae. I generate the first radiocarbon ( $\Delta^{14}\text{C}$ ) age estimates for adult white sharks, dramatically extending the maximum age and longevity compared to earlier age studies.  $\Delta^{14}\text{C}$  results also verify a lack of reworking of vertebral material and hint at possible sexual dimorphism in growth rates. Using amino acid and bulk stable isotope analyses, I show that individual sharks have marked variation in feeding and movement, and that pinnipeds do not constitute a large portion of their diet. Finally, I explore the utility of elemental chemistry to retrospectively infer movement. This work provides an important informational baseline for future NWA white shark ecological studies and conservation and management efforts.

**Doctoral Dissertation Defense of Thesis**