

1 **Species distribution modeling of deep sea sponges in the**  
2 **North Pacific Ocean**

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4 Fiona Davidson<sup>1</sup>

5 <sup>1</sup> Department of Geography, Environment and Geomatics, University of Ottawa, Ottawa, Canada

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7 Corresponding Author:

8 Fiona Davidson<sup>1</sup>

9 Email address: [fdavi065@uottawa.ca](mailto:fdavi065@uottawa.ca)

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29 **Abstract:** Knowledge of deep-sea species and their ecosystems is limited due to the  
30 inaccessibility of the areas and the prohibitive cost of conducting large-scale field studies. My  
31 graduate research has used predictive modeling methods to map hexactinellid sponge habitat  
32 extent in the North Pacific, as well as climate-induced changes in oceanic dissolved oxygen  
33 levels and how this will impact sponges. Results from a Maxent model based on sponge  
34 presence data from the eastern Pacific, in conjunction with bathymetric terrain derivatives,  
35 closely mapped existing sponge habitats, and suggested a depth threshold around 3000 meters  
36 below which sponges are not found. Early results suggest that oxygen is another important  
37 predictor of sponge habitat, including this and a variety of other environmental predictors (e.g.  
38 based on ocean chemistry, physics and biology) and different model scales would improve  
39 model accuracy. The long-term goal of this research is to apply climate prediction data to the  
40 predictive modeling in order to assess the sensitivity of deep-sea sponge habitat to global  
41 climate changes.  
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