

# ELEMENT DISTRIBUTION MODELING TOOLS (EDM TOOLS): A CUSTOM ARCGIS TOOLBAR TO FACILITATE ROBUST SPECIES DISTRIBUTION MODELING

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## Abstract

Element distribution modeling (EDM), also called species distribution modeling and species-habitat modeling, is a powerful way to extrapolate spatially-explicit observations to broad-scale predictions of species distribution (predictive maps). Because predictions are mapped, they are directly applicable to environmental evaluation and land management decision-making. Current EDM approaches require substantial time and technical expertise to implement, and there are a growing number of software tools and algorithms being used (some requiring custom

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programming). However, many management decisions have to be made quickly by biologists with modest access to complex technologies or training. Our goal was to make EDM accessible to natural resource biologists without an expertise in statistics, GIS, and often complex modeling applications. The EDM Tools are organized around an ArcGIS toolbar mimicking the workflow common to distribution modeling including data preparation, data filtering, model choice and implementation, model evaluation and predictive mapping. We have created new tools and taken advantage of existing tools, implementing them from one workflow, making them accessible, user friendly, and properly applied to specific goals of species distribution modeling. The EDM tools are open-source tools with the only commercial software requirement being ArcGIS Desktop and the Spatial Analyst Extension (ESRI, Redlands, CA). By sharing our code and using free software as feasible, we hope to encourage advanced users to both contribute improvements to and borrow code as needed for other applications. We hope the EDM Tools help to make spatially-explicit modeling a regular, widespread, and efficiently-conducted part of natural resource evaluation and land management planning.

[Abstract Only]