MANGROVE SPECIES DISTRIBUTION MODEL IN BRAZILIAN COAST, USING CLIMATE DATA

Theme: Modeling tools & biodiversity conservation

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Mangrove forests once covered about 140,000 km^2 of sheltered (sub) tropical coastlines. From Brazil's 7,408 km of coastal zone, 6,786 km contain mangrove forests, which provide innumerous ecosystem services and support coastal livelihoods. Mangrove forests are submitted to different types of energy, including river flows, tides, solar radiation and precipitation. Climate affects mangrove colonization and growth. The increasing anthropogenic pressure on coastal areas results in impacts that affect mangrove ecosystems and their biodiversity. In this context, mangrove vegetation species distribution, considering climatic conditions were modeled along the Brazilian coast. Human pressures and mangrove conservation are discussed. The Maxent algoritm was used to produce the species potential distribution models for each typical mangrove vegetation species. The SpeciesLink network was used to create the species occurrence database input. Occurrence records of *Avicennia germinans* (L.) L., *Avicennia schaueriana* Stapf & Leechm. ex Moldenke, *Laguncularia racemosa* (L.) C.F. Gaertn. and *Rhizophora mangle* L. were available in minimal individual number to generate models. Climatic layers were accessed from WorldClim database, compatible to geographic coordinate system and Datum WGS84. Ten variables were selected, among altitude, temperatures, precipitations, and bioclimatics, which showed high relevance in a previous test about mangrove species distribution models. The final map was created from the combination of the mangrove species potential distribution models results. The operation used was the maximum value of potential occurrence. The analysis focused on the areas which the results brought the mangrove occurrence potential minimum of 0.8. The final map showed mangrove distribution along the Brazilian coast from Amapá (4°30'N) to Santa Catarina (28°30'S), with major responses in estuaries, river mouths and sheltered areas, as indicated by the literature. Besides the Preserved Areas such as Reentrâncias Maranhenses (Maranhão), Cananéia-Iguape Coastal System (São Paulo) and Superagui Island (Paraná), the others sites with high mangrove species potential distribution are located on severe anthropogenic impacted areas. Baía de Todos os Santos (Bahia), Vitória (Espirito Santo), Baía de Guanabara (Rio de Janeiro) and Baixada Santista (São Paulo) among others are submitted to strong industrial and harbor activities and urbanization. The loss of large mangrove forests areas will promote devastating economic and environmental consequences of coastal communities. Considering the global climate change and the sea level rise, mangrove ecosystem should be able to adapt to new environmental conditions. We suggest new analysis using model and others environmental variables to build scenarios of mangrove species distribution to help coastal zone management and mangrove conservation.