Modelled potential habitat suitability for selected species in south-east Australia, under current and future climate scenarios

Title: Modelled potential habitat suitability for selected species in south-east Australia, under current and future climate scenarios

Custodian: Macquarie University

Abstract / Description: A folder of geoTIFF files of modelled potential habitat suitability for selected species in south-east Australia has been created using Maxent (v 3.3.3k). The models utilise records of fauna and flora species occurrence collated in New South Wales Office of Environment and Heritage Wildlife Atlas, Victorian Biodiversity Atlas, Royal Botanic Gardens Sydney, and the Atlas of Living Australia. All records have a reported location precision of at least /- 1000m, and all have been collected since 1950. Background records were restricted to all flora or fauna occurrence records from the above databases located within a buffer of 200 km around a convex hull that encompasses the target species' records. All models are based on up to 13 environmental layers: mean diurnal temperature range; temperature seasonality (the coefficient of variation of weekly mean temperature); maximum temperature of the warmest week; minimum temperature of the coldest week; precipitation of the wettest week; precipitation of the driest week; and precipitation seasonality (the coefficient of variation of weekly total precipitation); three soil variables[1]; weathering intensity[2]; topographic wetness index[3]; topographic position index[4]. Climate layers are modelled using ANUCLIM software on a 1000m digital elevation model[5]. Future climate scenarios were developed as part of the NSW and ACT Regional Climate Modelling (NARCliM) project[6]. Model performance has been assessed using the area under the ROC curve (AUC) with the 95th percentile AUC. The maximum sum of the test sensitivity plus specificity logistic threshold was applied to convert model output to a prediction of potential habitat suitability.

Purpose: Potential habitat suitability models provide a general guide to where suitable habitat for a target species is located across a region. The output of these models could be used to aid species management or prioritization, to identify regions for future surveys to target, and to undertake a broadscale assessment of the impacts of climate change on a species. Maps of habitat suitability should not be interpreted as actual distributions, as they only consider a limited number of variables that may influence the likelihood of populations establishing and persisting in a region. As such, it is likely that some areas identified as suitable by the model will not contain populations for myriad reasons including: vegetation type is unsuitable or habitat is

unavailable; dispersal limitation or barriers; other biotic requirements are not met. Users should utilise the maps in conjunction with other spatial data and expert knowledge.

While the maps provide a broad understanding of how climate change may alter habitat suitability, users should be aware that other factors influencing vulnerability to climate change are not including in the modelling process, including genetic adaptation, phenotypic plasticity, presence of micro-refugia, alterations to biotic interactions or future land-use changes.

Language: eng

Temporal and Spatial extents:

Spatial representation type: raster
Coordinate Reference System EPSG code: EPSG:3577

Bounding box:
West bounding longitude: 112
East bounding longitude: 154
South bounding latitude: -44
North bounding latitude: -10
Temporal extent:
Start: 2017-03-01 *End:* 2017-03-01

Data Quality

Data quality scope:
Level: dataset
Attribute accuracy (non quantitative):

Potential Habitat Models for New South Wales plant and animal species. While every effort has been made to ensure the information presented is reliable, Macquarie University and the State of New South Wales give no assurance in respect to its accuracy and shall not be liable for any loss or damage arising from its use. Potential Habitat Suitability Models should be used as a guide to the distribution of potential habitat only and are not a substitute for field survey by skilled observers. Projections of habitat suitability under future climate scenarios are not forecasts of actual range changes. Potential Habitat Models are subject to review and are updated as additional data becomes available.

History:

Lineage statement:

Modelled potential habitat suitability for selected species in south-east Australia, under current and future climate scenarios is a folder of geoTIFF files identifying the location of potential habitat as predicted by variables describing climate, soil, weathering index, and topographic wetness and position.

Distribution

Name/identifier: ClimateRefugeNSW
Website: nswclimaterefugia.net
Website: Function: download

Contact Organisation

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Address: North Ryde, NSW, 2109

Status

Progress status: onGoing
Maintenance and update frequency: asNeeded

Data / Resource Constraints

Use limitation: PUBLIC
Copyright: (as use constraint)
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References

1. Viscarra Rossel, R. & Chen, C. Digitally mapping the information content of visible–near infrared spectra of surficial Australian soils. *Remote Sensing of the Environment* **115,** 1443–1455 (2011).
2. Wilford, J. A weathering intensity index for the Australian continent using airborne gamma-ray spectrometry and digital terrain analysis. *Geoderma* **183–184,** 124–142 (2012/8).
3. CSIRO. Topographic Wetness Index (3" resolution) derived from 1 second DEM-H version 1.0. (2012).
4. CSIRO. Topographic position index (3" resolution) derived from 1 second DEM-S version 0.1.

(2012).

5. Hutchinson, M. F. & Xu, T. B. *ANUSPLIN Version 4.4 User Guide*. (The Australian National University, Canberra, 2013).

6. Evans, J. P. *et al.* Design of a regional climate modelling projection ensemble experiment--NARCliM. *Geoscientific Model Development* **7,** 621–629 (2014).