Winter 2015 Issue 9

PREDICTS Newsletter

Projecting Responses of Ecological Diversity In Changing Terrestrial Systems

First PREDICTS Database paper published in *Ecology & Evolution*

A paper describing the PREDICTS database (but not making the data available) has been published in *Ecology & Evolution* and has made quite a splash on Twitter. Thank you very much indeed to all our contributors for having provided the data that have made the database possible! The paper describes the database as of March 2014, since when we have incorporated a further one million measurements. PREDICTS now includes more than 2.7 million measurements of more than 40,000 taxa spread across 93 countries, 14 biodiversity hotspots and every major biome. We intend to make the full database publicly available during 2015, alongside which we will produce a second open-access manuscript - we will offer co-authorship on this manuscript to all who contributed data that is included in the public release. Thanks to the generous contributions of many people we have a large backlog of datasets - more than 50 - that we have not yet had time to assess and add to our database. We are working to get these data processed within the next few months. New offers of data are, of course, always very welcome - if you would like to contribute data to the PREDICTS project, please complete our online form. We will do our best to respond promptly. Our intention is to publish further update to the database periodically.

***Dr Lawrence Hudson**, Natural History Museum*

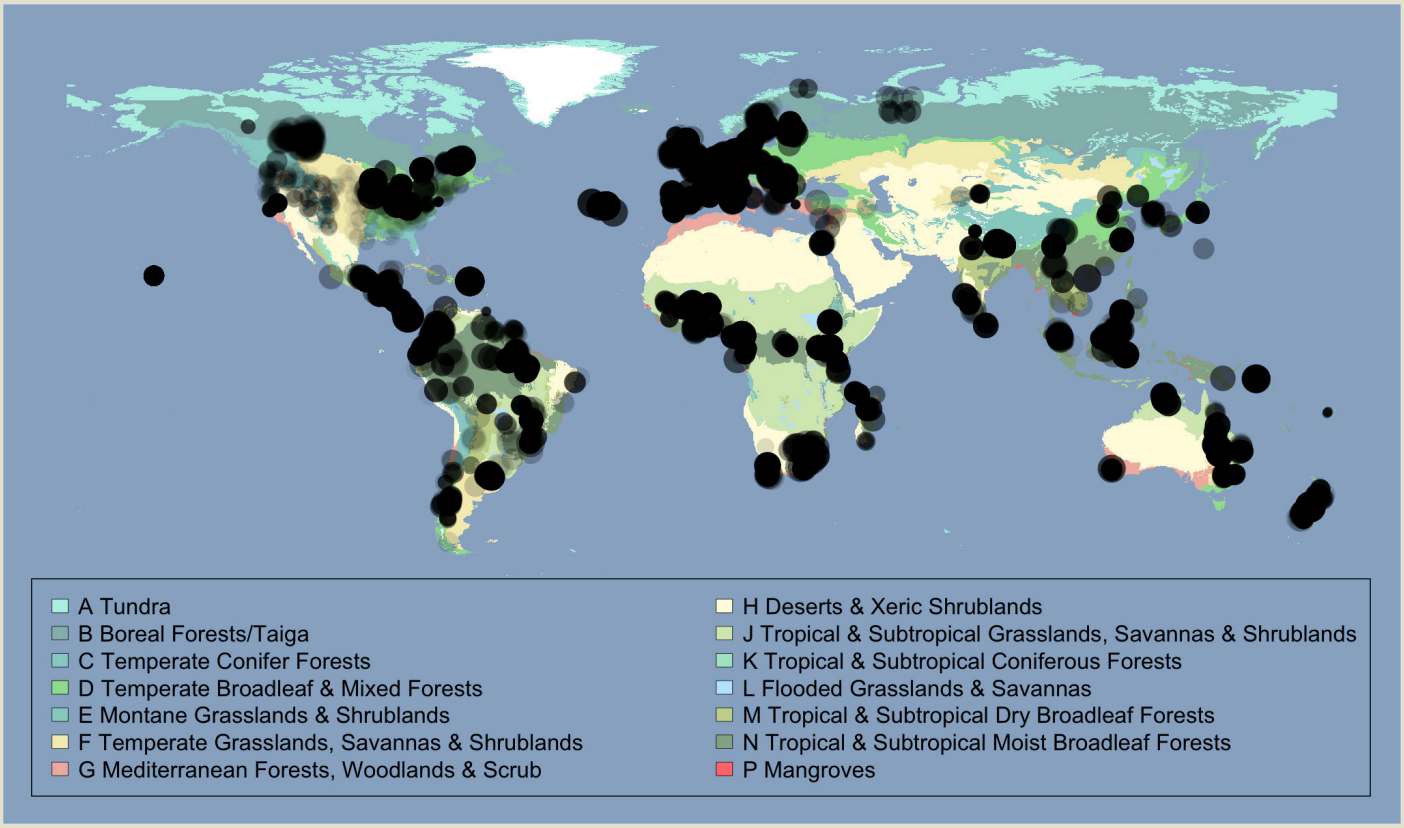

Figure: The map shows sampling locations data in the PREDICTS database in early February 2015. Colours indicate biomes, taken from The Nature Conservancy's (2009) terrestrial ecoregions of the world dataset (http://maps.tnc.org/gis_data.html), shown in a geographic (WGS84) projection. Circle radii are proportional to $\log_{10}$ of the number of samples at that location. All circles have the same degree of partial transparency.

New PREDICTS MRes students

Welcome to Benno Simmons and Charlotte Chng, who have started MRes projects at Imperial College London related to PREDICTS. Here's what the students have to say about their ongoing project work:

***Benno Simmons**, MRes Ecology, Evolution and Conservation at Imperial College London*

PREDICTS, and other modelling approaches, tend to assume that biodiversity responses to land-use change are the same in all locations. However, this assumption is potentially dangerous: if hyper-diverse regions are more sensitive to human pressures than the more commonly studied temperate realm, models could be underestimating the damage being done to biodiversity. My project tests whether the biota of the world's 35 biodiversity hotspots are particularly sensitive to land-use change — as might be expected given the very high levels of species endemicity. I am also assessing how responses differ among hotspots and taxonomic groups.

This project represents one of the most geographically and taxonomically comprehensive analyses to date of the vulnerability of biodiversity hotspots to land-use change.

***Charlotte Chng**, MRes Ecology, Evolution and Conservation at Imperial College London*

New Zealand has a highly endemic biota as a result of its long isolation as small oceanic islands. It is also one of the last major landmasses to be colonized by humans, and has experienced much more recent and dramatic land use changes in the past century than other temperate regions such as western Europe. My project aims to collect data on New Zealand's biodiversity from authors, where the data will be used to model empirically the effects of land use on New Zealand's biodiversity and compare with that in other temperate regions. The data will also be used to project future trends in New Zealand's biodiversity under the four Representative Concentration Pathways.

"PREDICTS Mark II" – new funding for the PREDICTS framework

The UK's Natural Environment Research Council (NERC) has funded a new 3-year project that develops the PREDICTS framework. Entitled, "How does global land-use change reshape ecological assemblages?", the new project will focus on temporal, rather than spatial comparisons. We will be looking for published "before-and-after" comparisons of how sites' ecological assemblages changed when land use changed. We'll also compile information on species' functional ecology and phylogeny, integrating this with the assemblage data to ask such questions as:

- Which happens first: loss of current diversity or gain of new diversity?
- Which facets of assemblage structure and function are most sensitive to land-use change?
- Do spatial and temporal comparisons agree about land-use change?

This new grant will start in the summer, with a call-out to anyone who has suitable data sets they'd be willing to share. We're especially interested in studies that have a Before-After-Control-Impact design, and where sites were sampled at multiple times after land use changed.

***Prof Andy Purvis**, Natural History Museum*

Global models of diversity – London workshop, January 2015

On 20th January, the PREDICTS team held a workshop at the Natural History Museum jointly with the team behind a very different approach to modelling global biodiversity – the Madingley model. We were joined by around 20 British and European biodiversity researchers representing a very wide array of systems and approaches. This group gave us really useful and constructive critiques and suggestions of how the two approaches could be developed separately and ways they might be able to move towards integration. There was a real buzz about the day, and we hope that we – and the broader community – are able to build on it to increase the profile of global biodiversity modelling.

Picture: Drew Purves of Microsoft Research introduces the range of approaches for modelling biodiversity.

#Predictsproject

Contact email: enquiries@predicts.org.uk

Thanks to Domenico Tozzi for producing the PREDICTS logo.