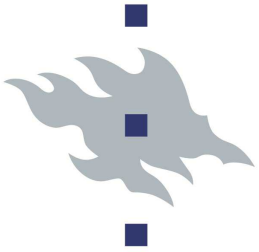
Voivatko globaalit analyysit ja aineistot tarjota pohjaa maankäytön suunnittelulle? Esimerkkejä suojelusuunnittelusta

Tuuli Toivonen
Geotieteiden ja maantieteen laitos



UNIVERSITY OF HELSINKI

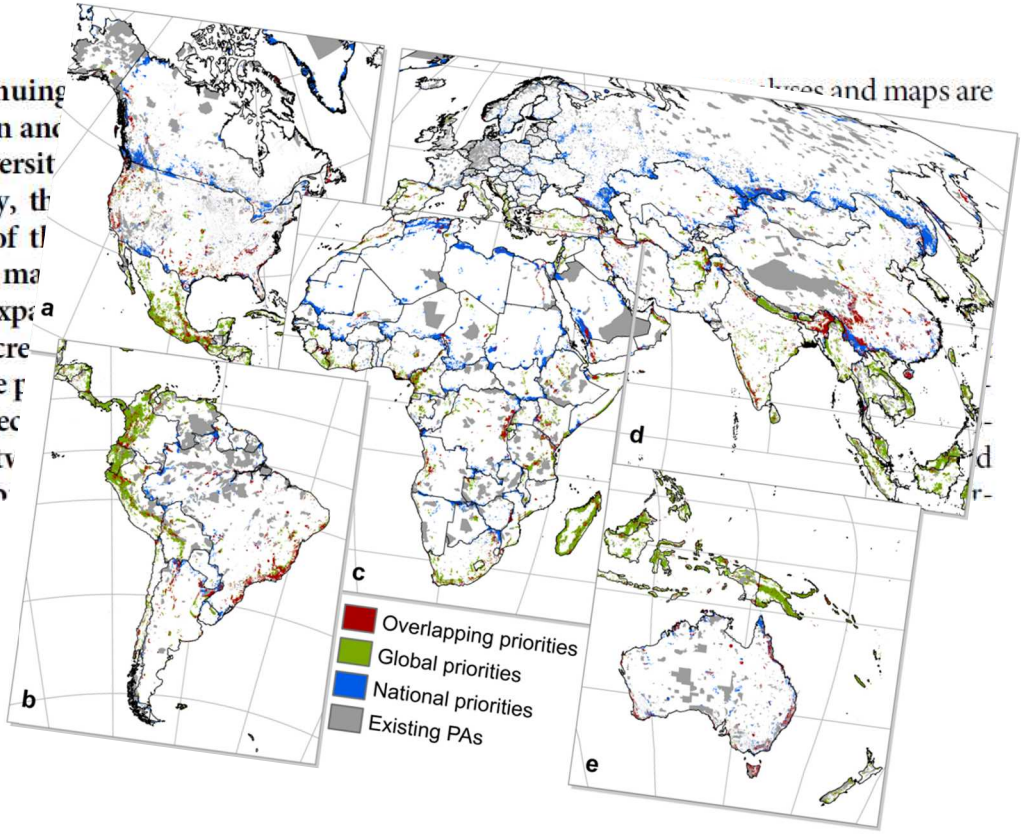
LETTER nature

doi:10.1038/nature14032

Global protected area expansion is compromised by projected land-use and parochialism

Federico Montesino Pouzols[1]†*, Tuuli Toivonen[1,2]*, Enrico Di Minin[1,3], Aija S. Kukkala[1], Peter Kullberg[1], Johanna Kuusterä[1,4], Joona Lehtomäki[1], Henrikki Tenkanen[2], Peter H. Verburg[5] & Atte Moilanen[1]

Protected areas are one of the main tools for halting the continuing global biodiversity crisis[1–4] caused by habitat loss, fragmentation and other anthropogenic pressures[5–8]. According to the Aichi Biodiversity Target 11 adopted by the Convention on Biological Diversity, the protected area network should be expanded to at least 17% of the terrestrial world by 2020 (http://www.cbd.int/sp/targets). To maximize conservation outcomes, it is crucial to identify the best expansion areas. Here we show that there is a very high potential to increase protection of ecoregions and vertebrate species by expanding the protected area network, but also identify considerable risk of ineffective outcomes due to land-use change and uncoordinated actions between countries. We use distribution data for 24,757 terrestrial verteb



Tavoite 17% suojelusta:
Hukataanko mahdollisuus maankäytön muutokseen ja yhteistyön vähyyteen?

UNIVERSITY OF HELSINKI

Tavoite 17% suojelusta:
Hukataanko mahdollisuus hyvien
aineistojen puutteeseen?

UNIVERSITY OF HELSINKI

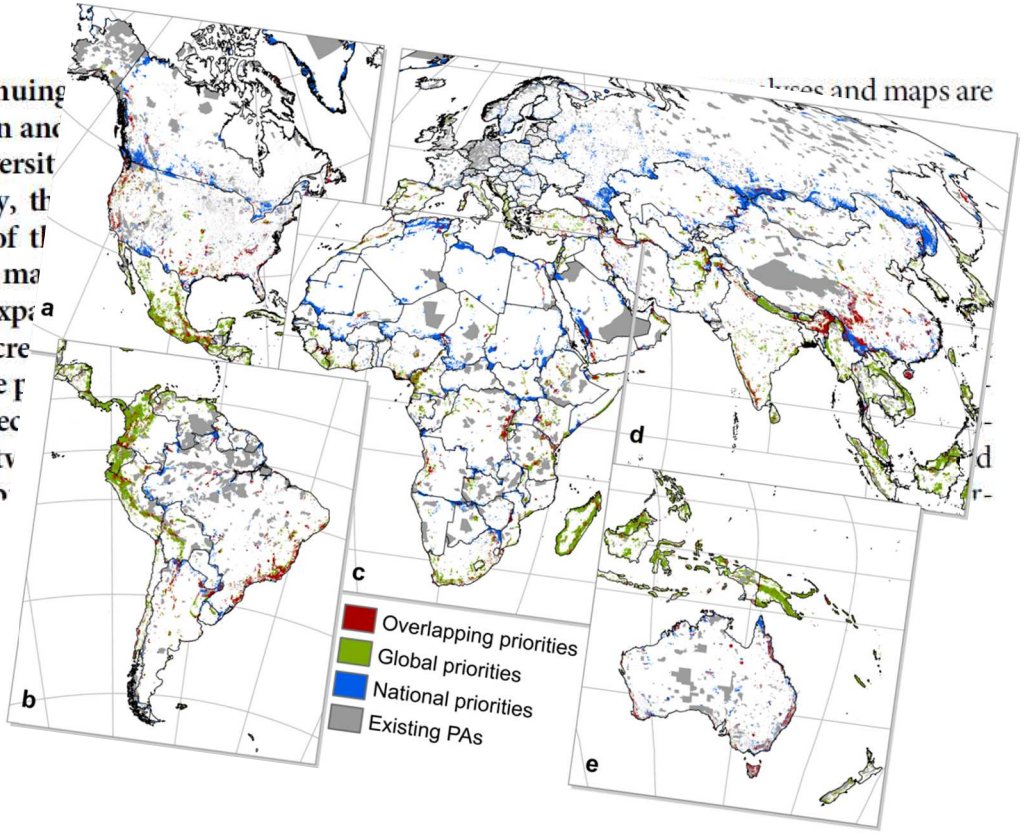
LETTER nature

doi:10.1038/nature14032

Global protected area expansion is compromised by projected land-use and parochialism

Federico Montesino Pouzols[1]†*, Tuuli Toivonen[1,2]*, Enrico Di Minin[1,3], Aija S. Kukkala[1], Peter Kullberg[1], Johanna Kuusterä[1,4], Joona Lehtomäki[1], Henrikki Tenkanen[2], Peter H. Verburg[5] & Atte Moilanen[1]

Protected areas are one of the main tools for halting the continuing global biodiversity crisis[1–4] caused by habitat loss, fragmentation and other anthropogenic pressures[5–8]. According to the Aichi Biodiversity Target 11 adopted by the Convention on Biological Diversity, the protected area network should be expanded to at least 17% of the terrestrial world by 2020 (http://www.cbd.int/sp/targets). To maximize conservation outcomes, it is crucial to identify the best expansion areas. Here we show that there is a very high potential to increase protection of ecoregions and vertebrate species by expanding the protected area network, but also identify considerable risk of ineffective outcomes due to land-use change and uncoordinated actions between countries. We use distribution data for 24,757 terrestrial verteb



Työryhmä

Fede

Tuuli

Atte

Enrico

Aija

Peter

Johanna

Joona

Peter


❶Maankäytön muutos:
Yksi biodiversiteettikriisin tärkeimmistä syistä
Mm. *Schipper et al 2008, Butchart et al 2010, Hoffmann et al 2010, Gibson et al 2011, Laurance et al 2012*

❷**Suojelualueet:** Yksi tärkeimmistä keinoista estää lajien häviäminen

e.g. *Rodrigues et al 2004, Butchart et al 2012, Thomas et al 2012, LeSaout et al 2013*

❸ CBD Aichi Target 11

By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, **are conserved through** effectively and equitably managed, ecologically representative and well connected **systems of protected areas** and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

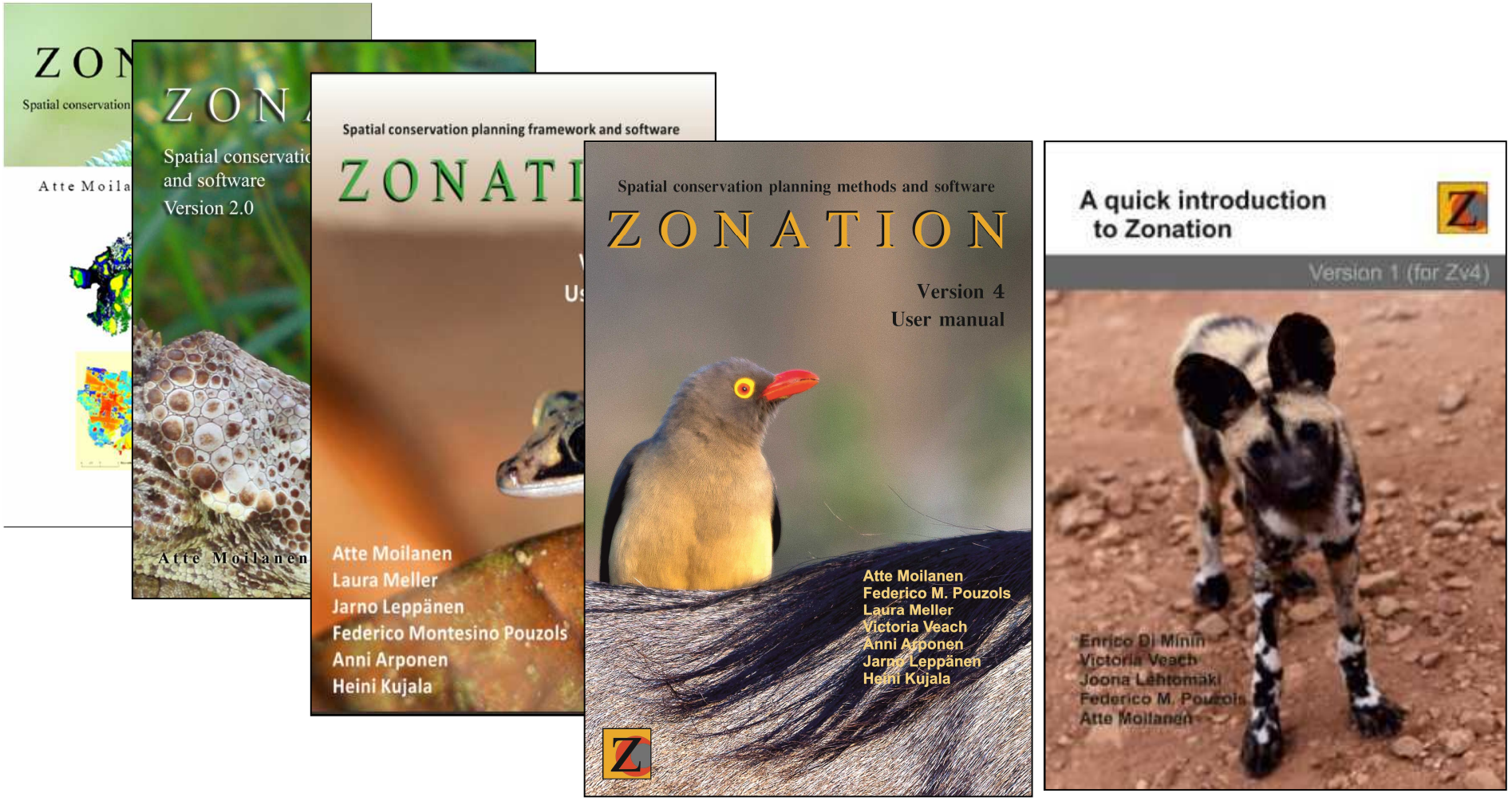
Convention on Biological Diversity

Kysymykset

- Kuinka paljon suojelualueverkon laajennus voisi parantaa lajien suojelutasoa
- Mikä vaikutus maankäytön muutoksella on suojelun mahdollisuuksiin?
- Kuinka paljon kansallisella tasolla toimiminen vaikuttaa tuloksiin?

- (Voidaanko kysymyksiä lähestyä globaalisti ja silti paikallisesti mielekkäällä tarkastelutasolla?)

Zonation ohjelmisto



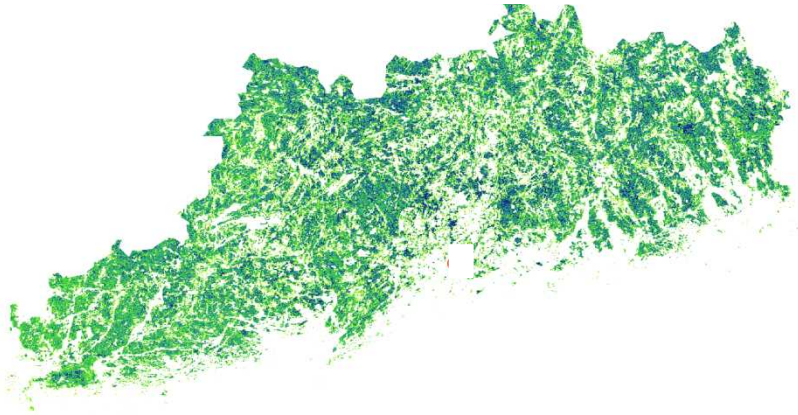
C-BIG Conservation Biology Informatics Group

University of Helsinki, Department of Biosciences

http://cbig.it.helsinki.fi

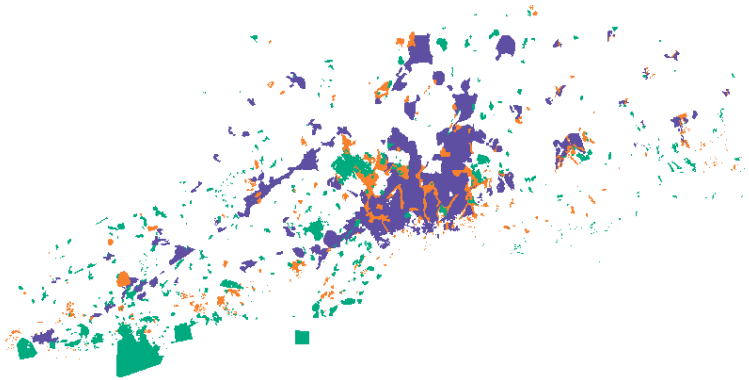
Aineiston tyypit

Jatkuvaa dataa

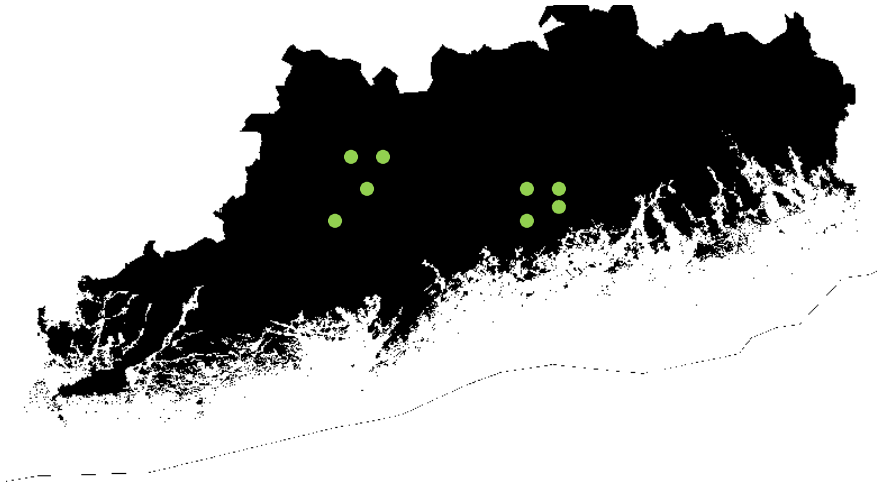


Binääridataa

Kategorista dataa

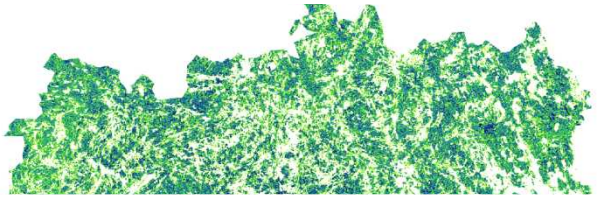


Pistedataa



Aineiston tyypit

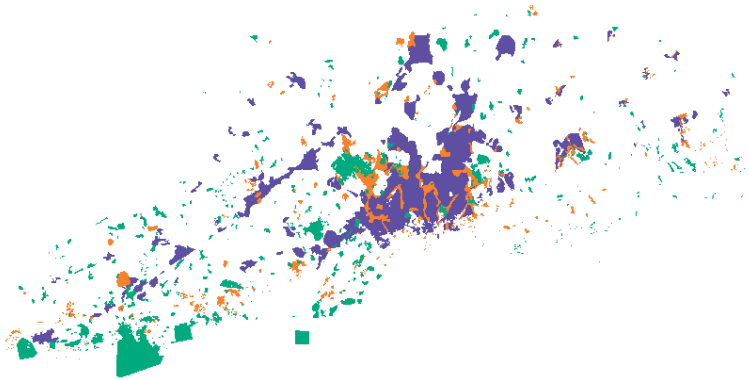
Jatkuvaa dataa



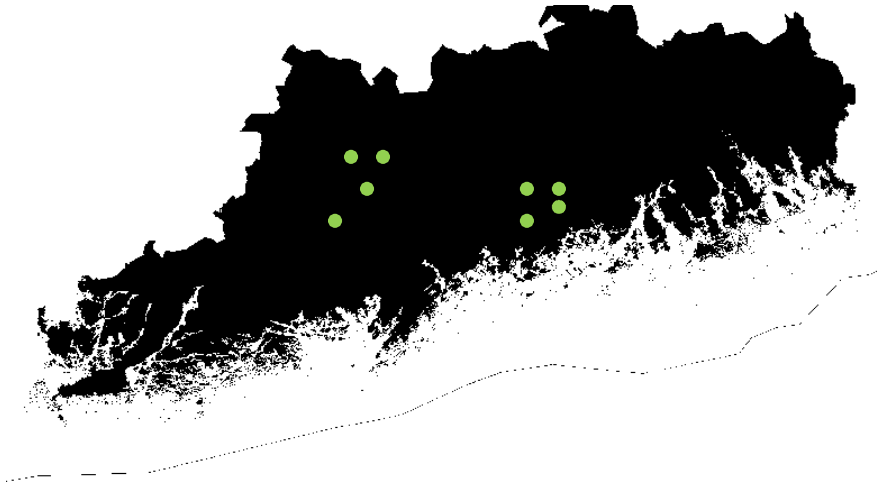
Binääridataa

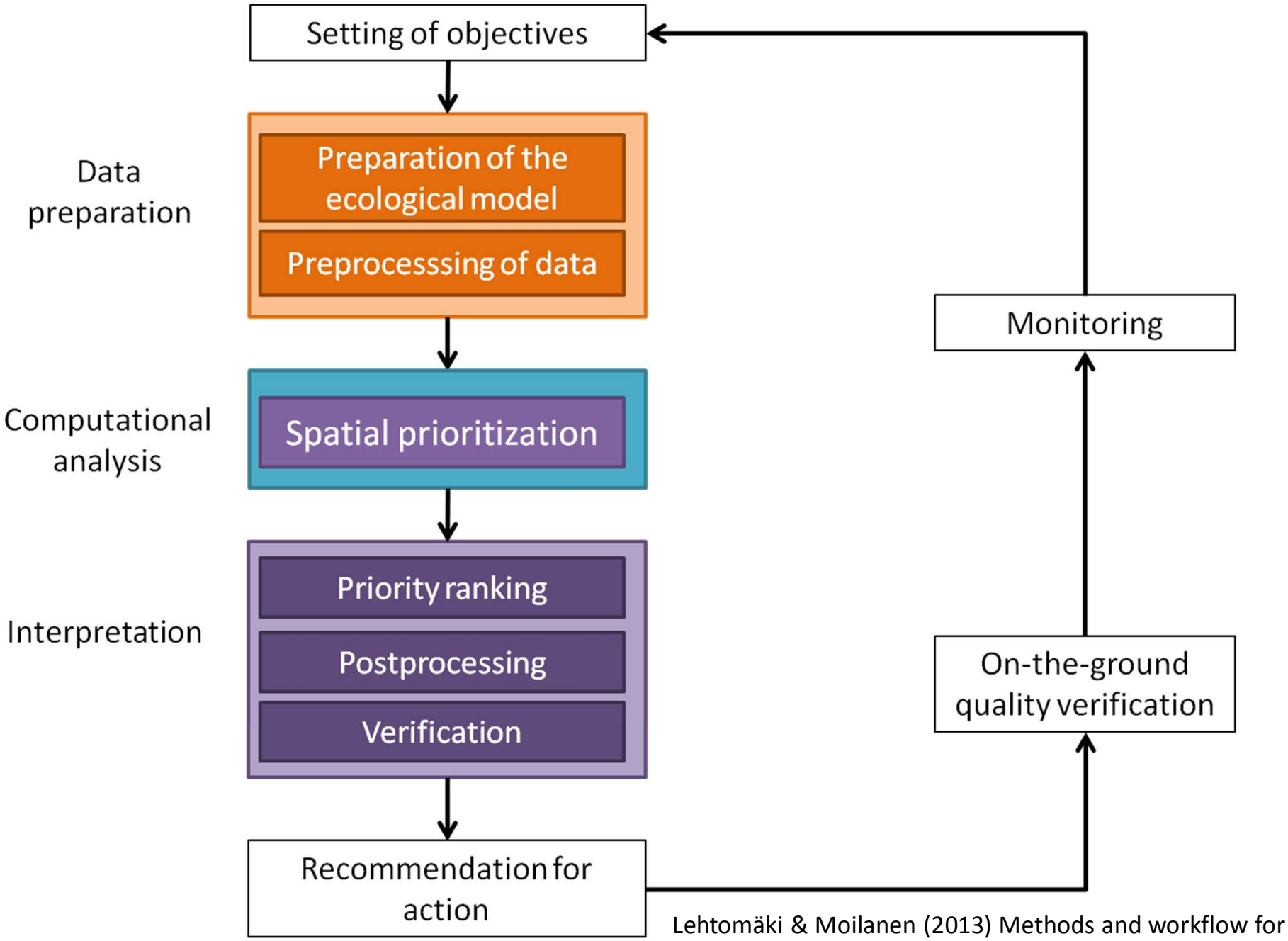
Harmonisoituina rasteritiedostoina

Kategorista dataa



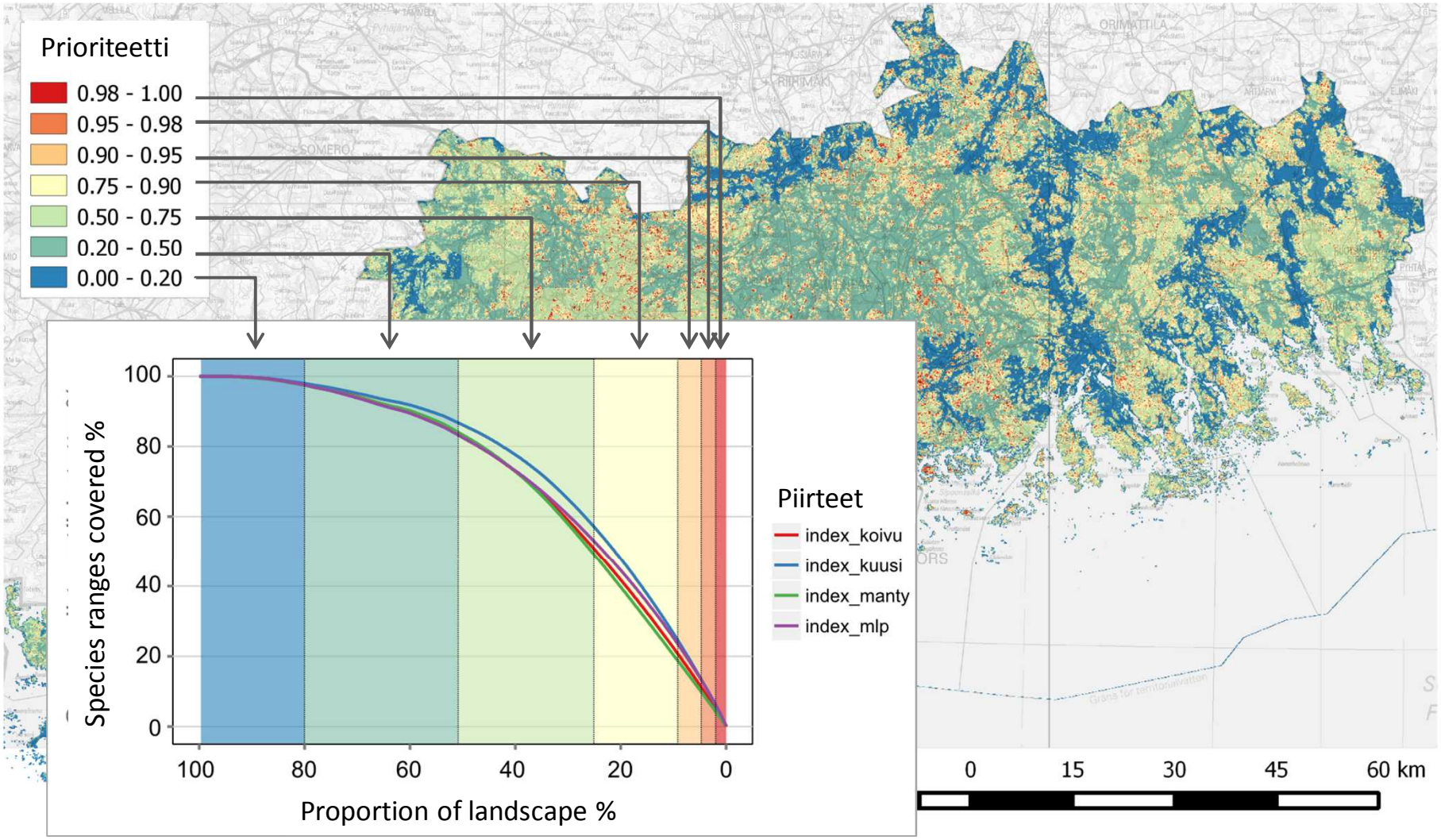
Pistedataa



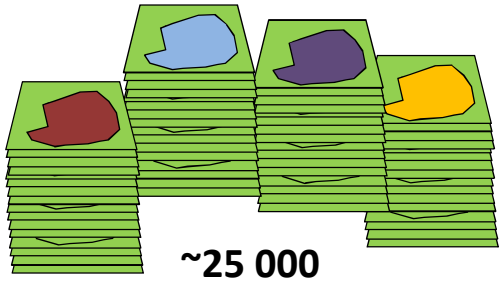


Lehtomäki & Moilanen (2013) Methods and workflow for spatial conservation prioritization using Zonation

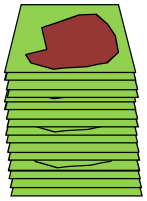
Zonation-tulokset



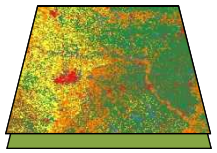
Analyysiprosessi



~25 000
Lajien levinneisyyttä

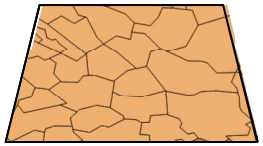


827
ecoregionia



Maankäyttö
- nykyisin
- Tulevaisuudessa (2040)

Suojelualueverkko



Valtioitten rajat

Global land use change scenarios

Global Change Biology

Global Change Biology (2012) **18**, 3125–3148, doi: 10.1111/j.1365-2486.2012.02759.x

A Land System representation for global assessments and land-use modeling

SANNEKE VAN ASSELEN and PETER H. VERBURG

Institute for Environmental Studies, VU University Amsterdam, De Boelelaan 1087, 1081 HV, Amsterdam, The Netherlands

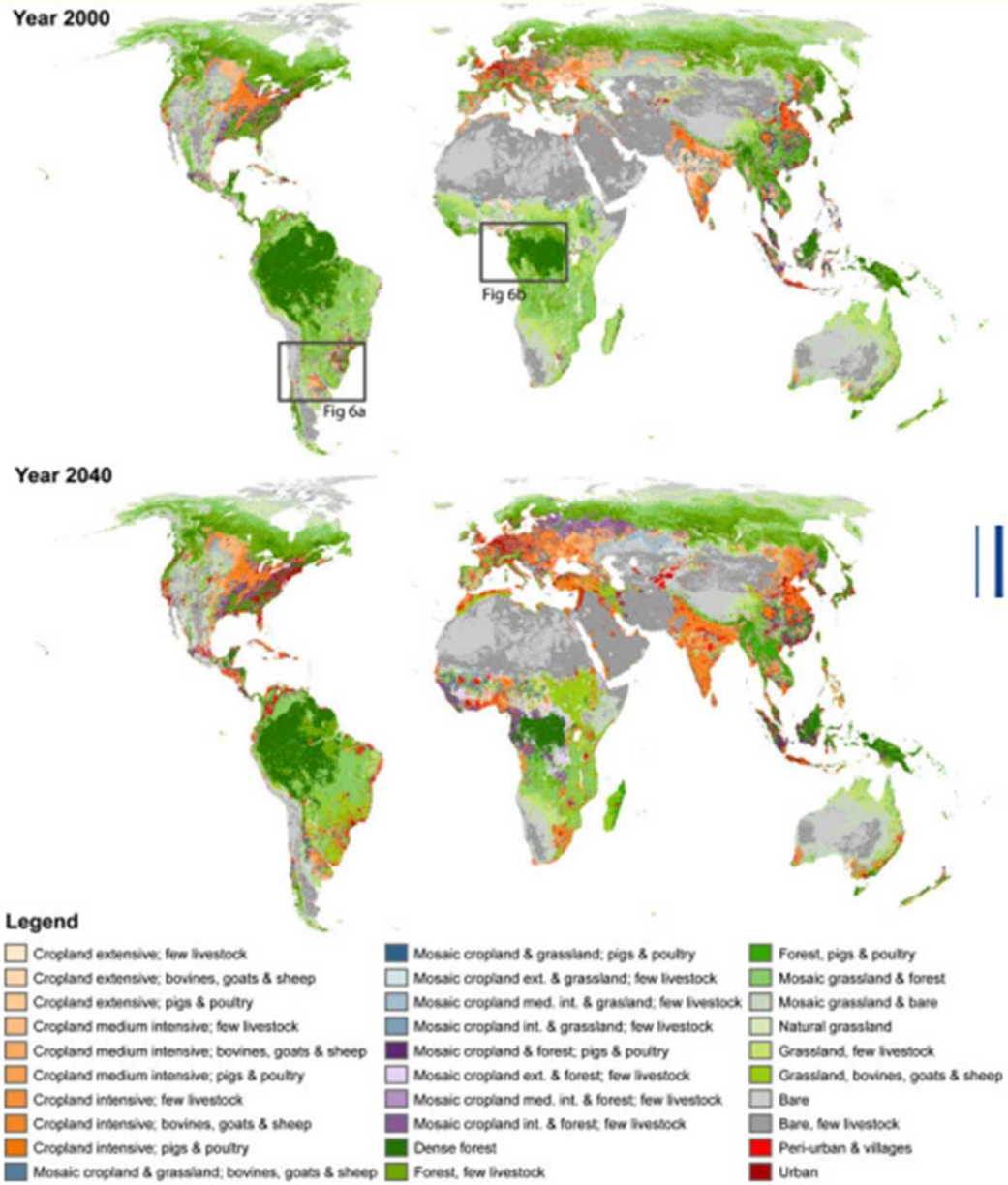
h:

Abstract

Current global scale land-change models used for integrated assessments and climate modeling are based on classifications of land cover. However, land-use management intensity and livestock keeping are also important aspects of land use, and are an integrated part of land systems. This article aims to classify, map, and to characterize Land Systems (LS) at a global scale and analyze the spatial determinants of these systems. Besides proposing such a classification, the article tests if global assessments can be based on globally uniform allocation rules. Land cover, livestock, and agricultural intensity data are used to map LS using a hierarchical classification method. Logistic regressions are used to analyze variation in spatial determinants of LS. The analysis of the spatial determinants of LS indicates strong associations between LS and a range of socioeconomic and biophysical indicators of human-environment interactions. The set of identified spatial determinants of a LS differs among regions and scales, especially for (mosaic) cropland systems, grassland systems with livestock, and settlements. (Semi-)Natural LS have more similar spatial determinants across regions and scales. Using LS in global models is expected to result in a more accurate representation of land use capturing important aspects of land systems and land architecture: the variation in land cover and the link between land-use intensity and landscape composition. Because the set of most important spatial determinants of LS varies among regions and scales, land-change models that include the human drivers of land change are best parameterized at sub-global level, where similar biophysical, socioeconomic and cultural conditions prevail in the specific regions.

Keywords: global, human-environment interactions, land cover, land system, land-change models, spatial determinants

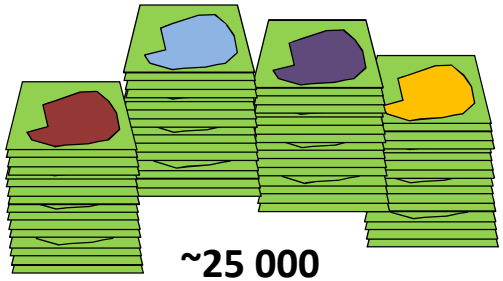
Global land use change scenarios



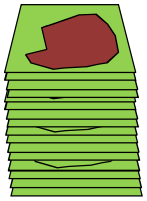
In collaboration with:

IVM Institute for Environmental Studies

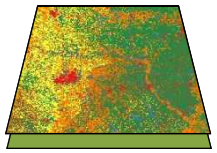
Analyysiprosessi



~25 000
Lajien levinneisyyttä

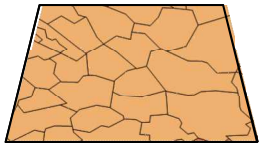


827
ecoregionia



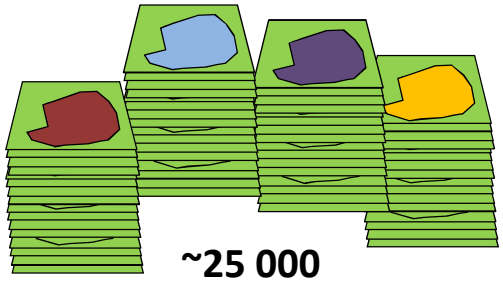
Maankäyttö
- nykyisin
- Tulevaisuudessa (2040)

Suojelualueverkko

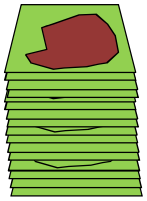


Valtioitten rajat

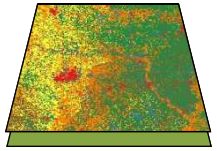
Analyysiprosessi



~25 000
Lajien levinneisyyttä

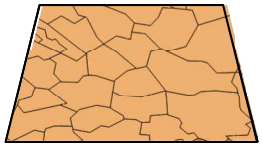


827
ecoregionia



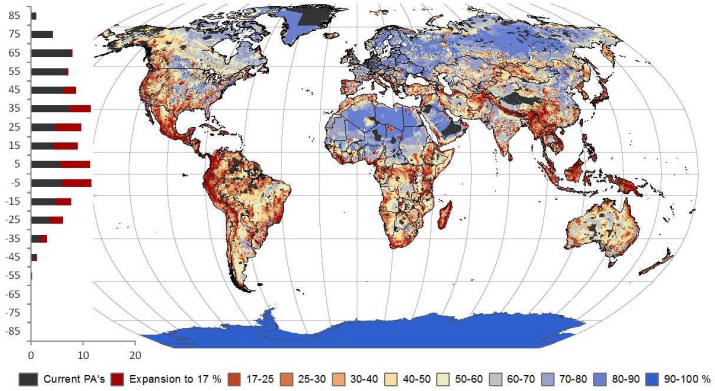
Maankäyttö
- nykyisin
- Tulevaisuudessa (2040)

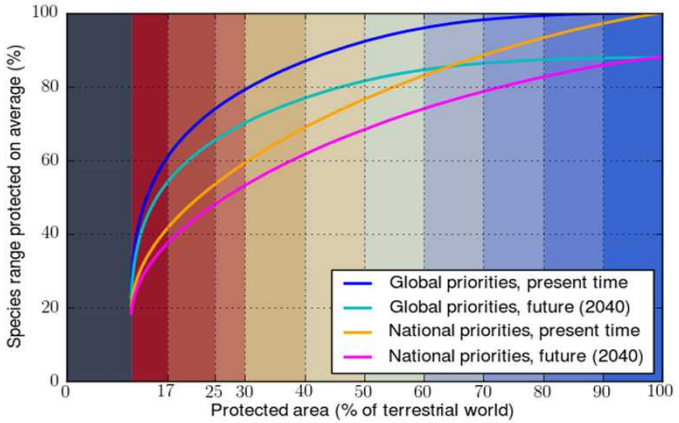
Suojelualueverkko



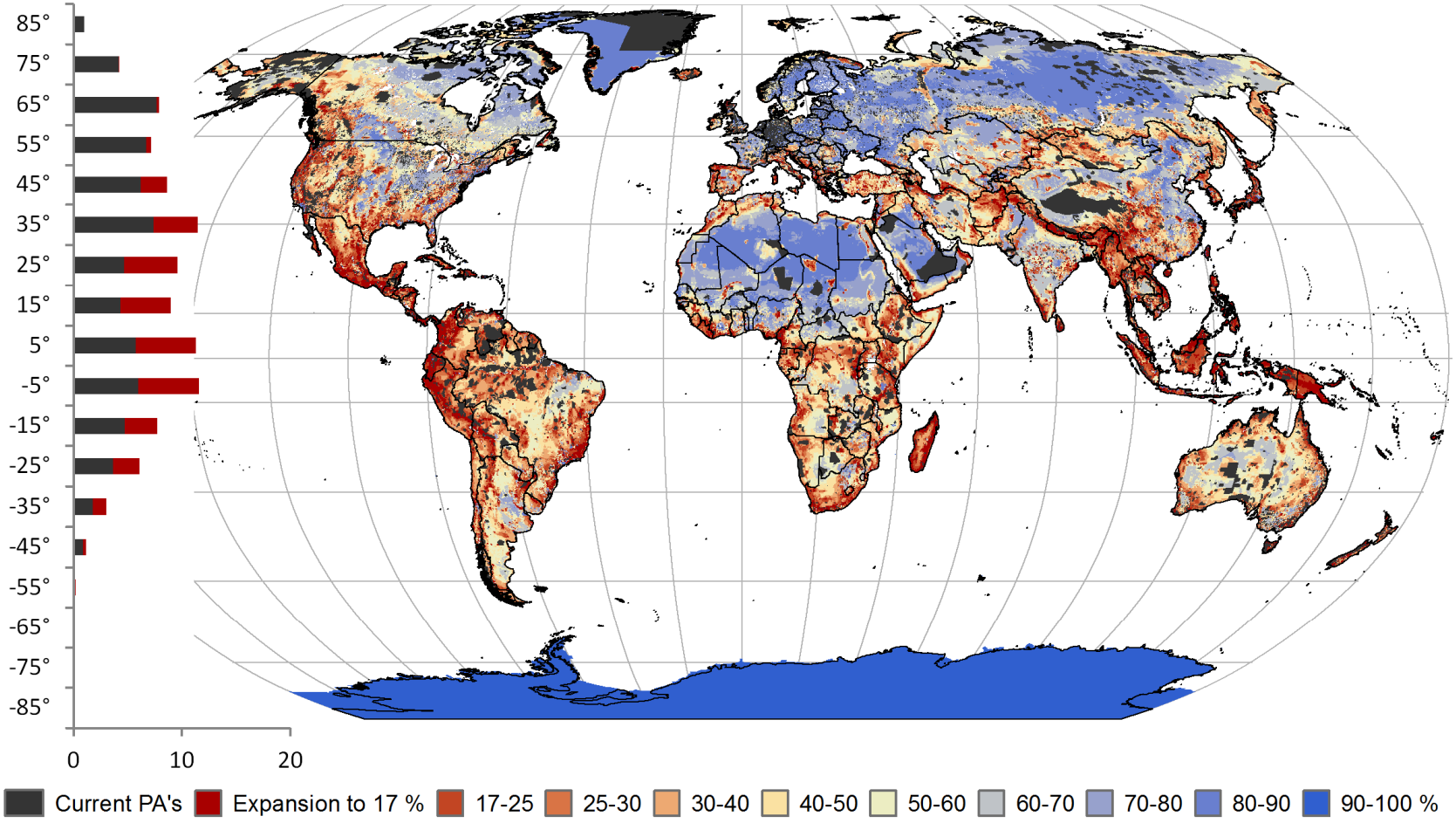
Valtioitten rajat

ZONATION
Conservation planning software



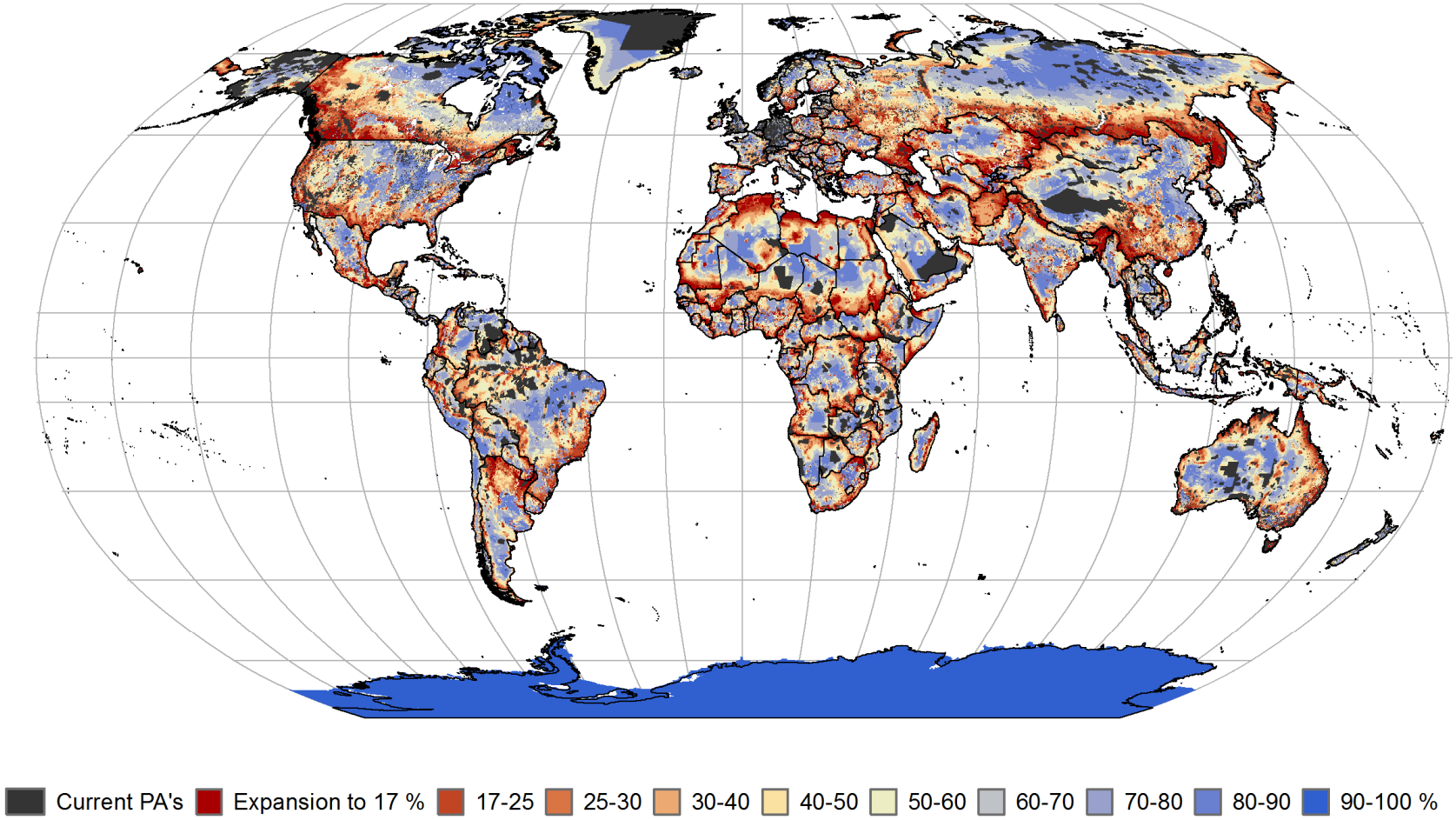


Prioriteetit 2040

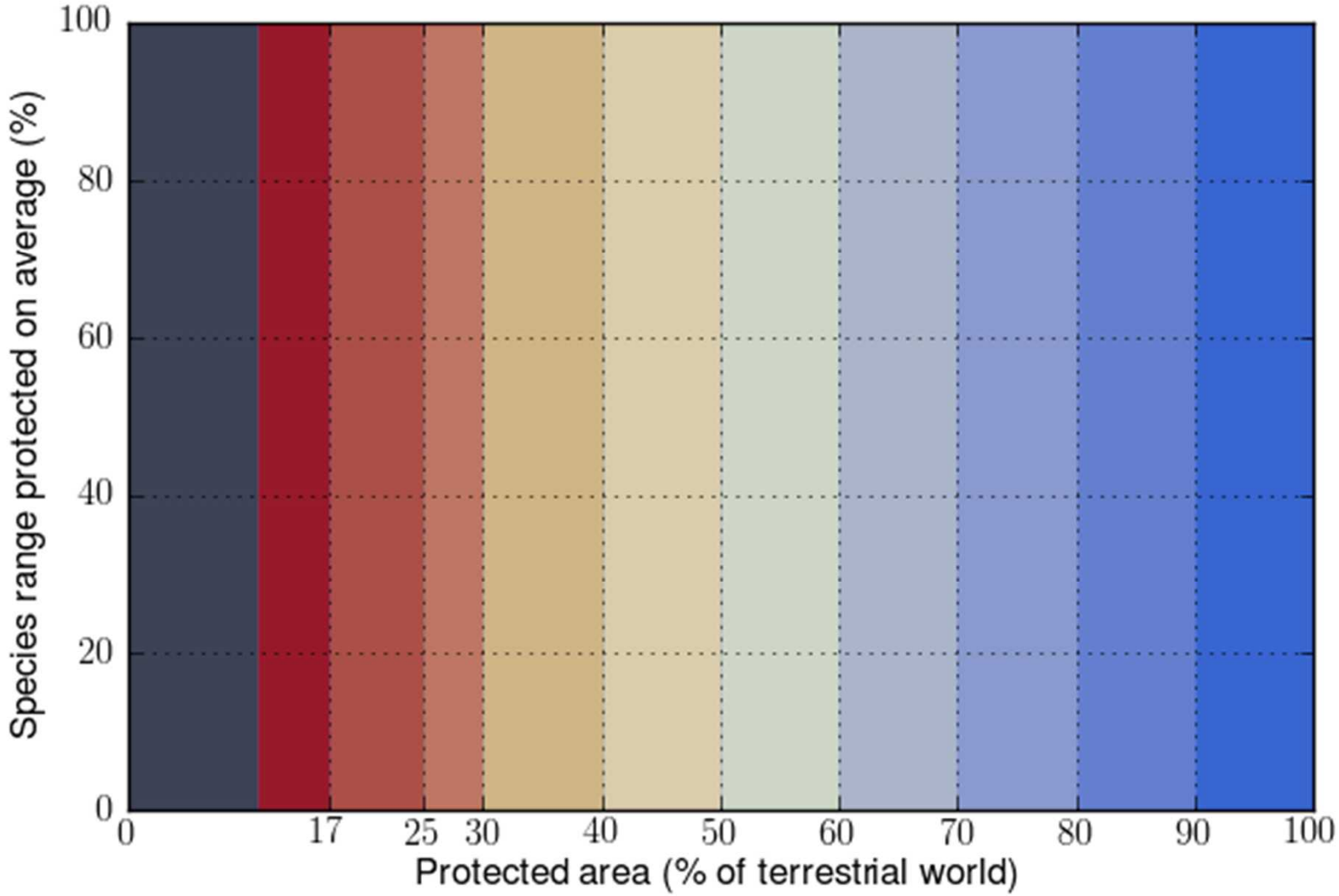


Include reference to Nature paper

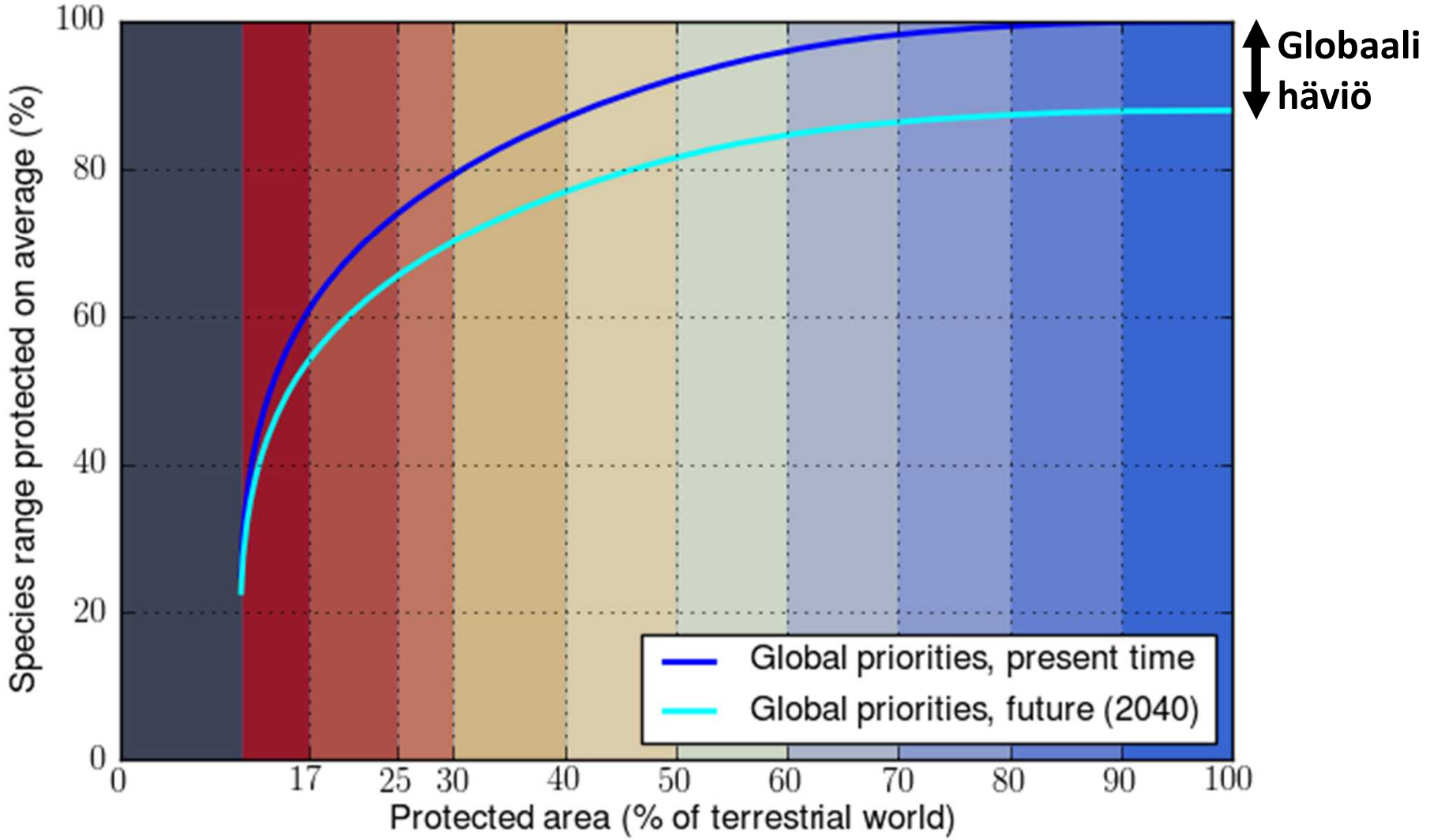
Kansalliset prioriteetit



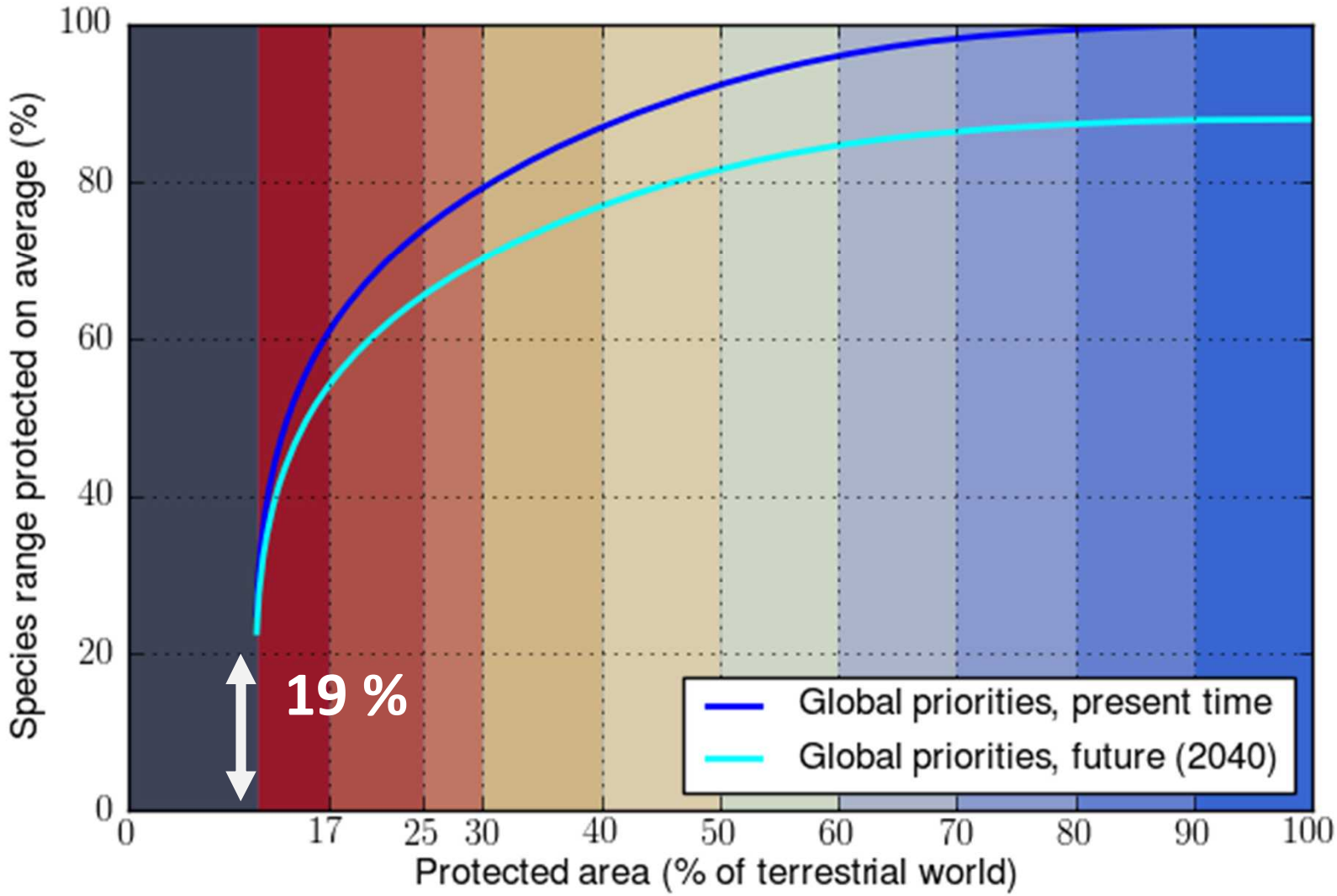
Suoriutuvuuskäyrät



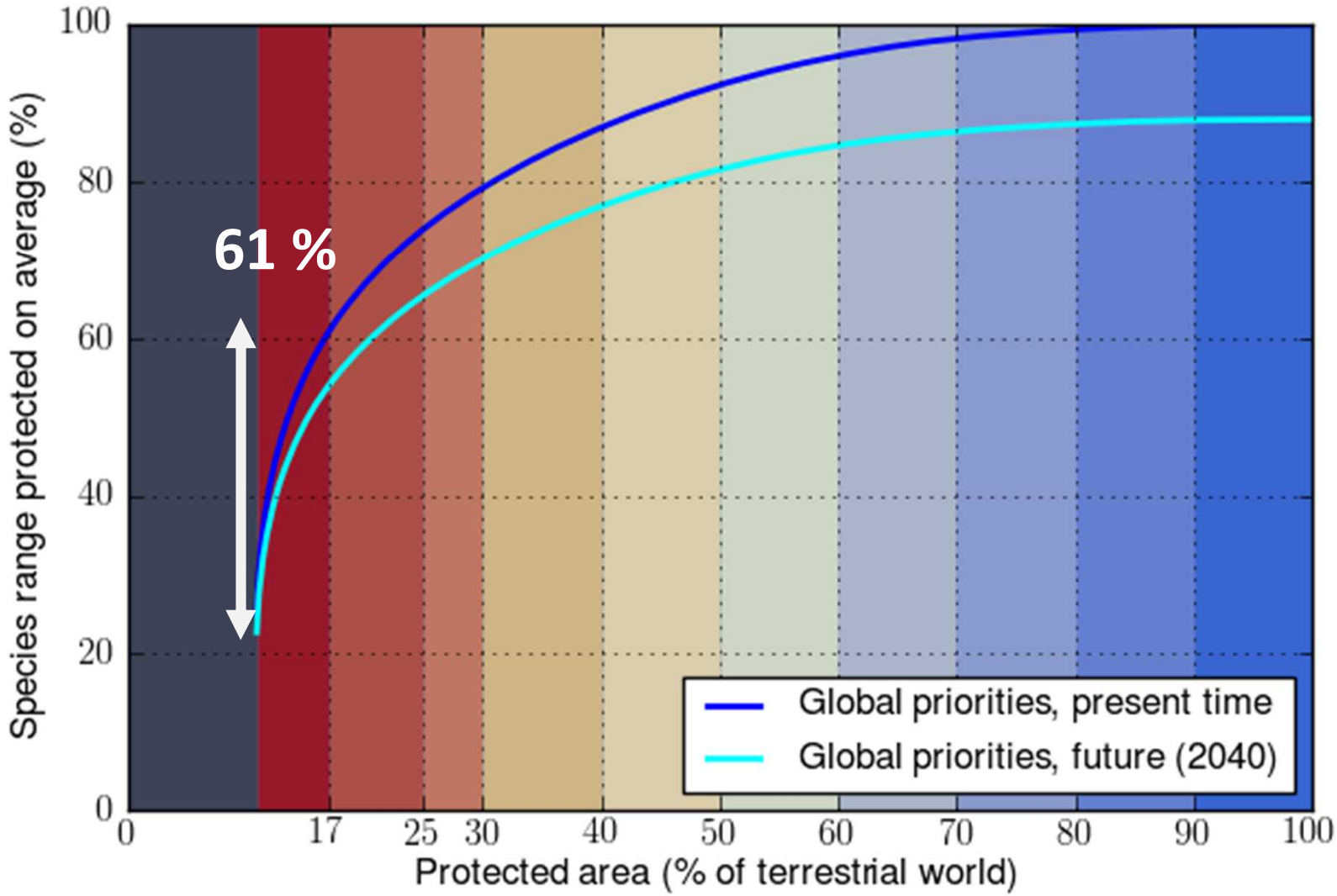
Suoriutuvuuskäyrät



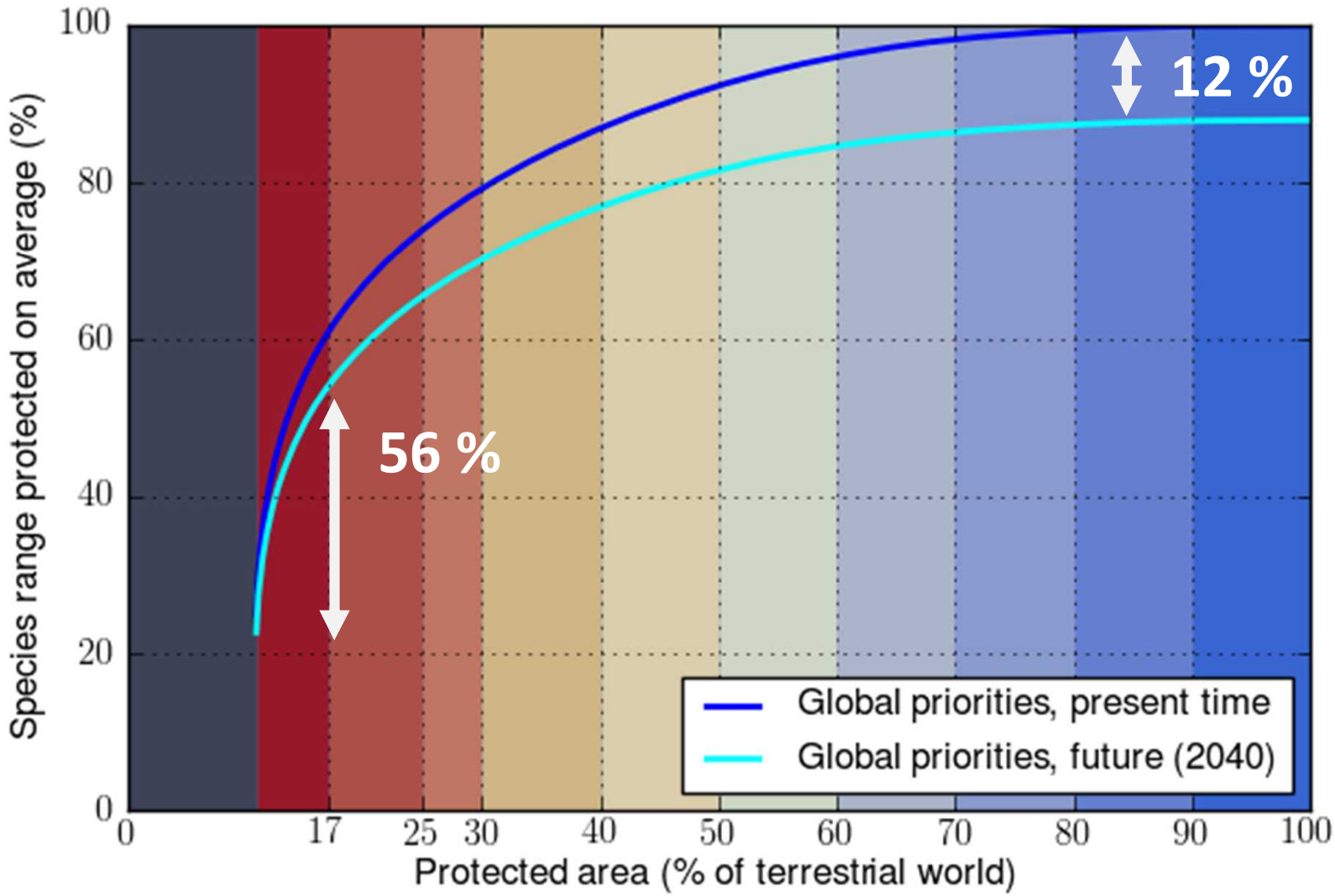
Suoriutuvuuskäyrät



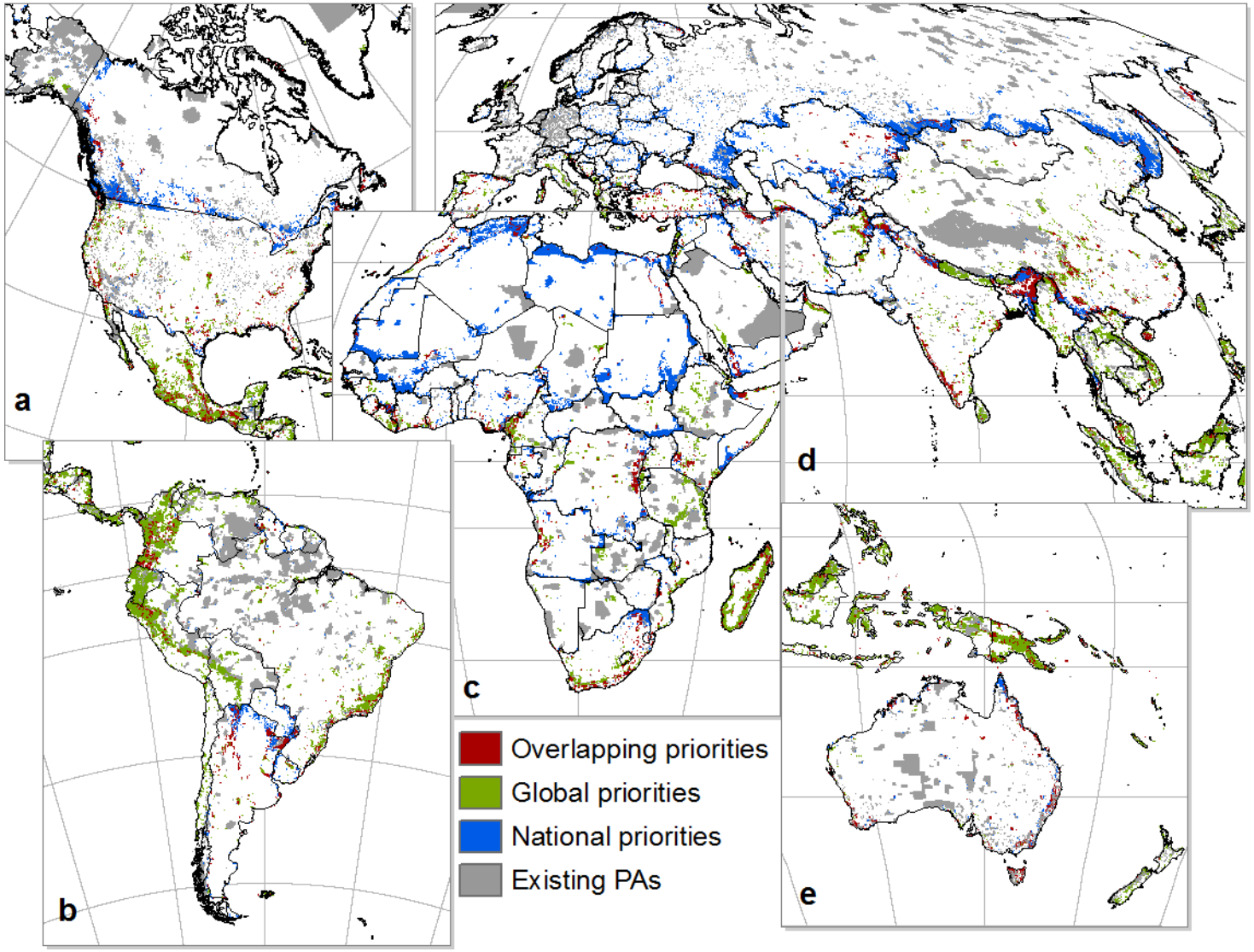
Suoriutuvuuskäyrät



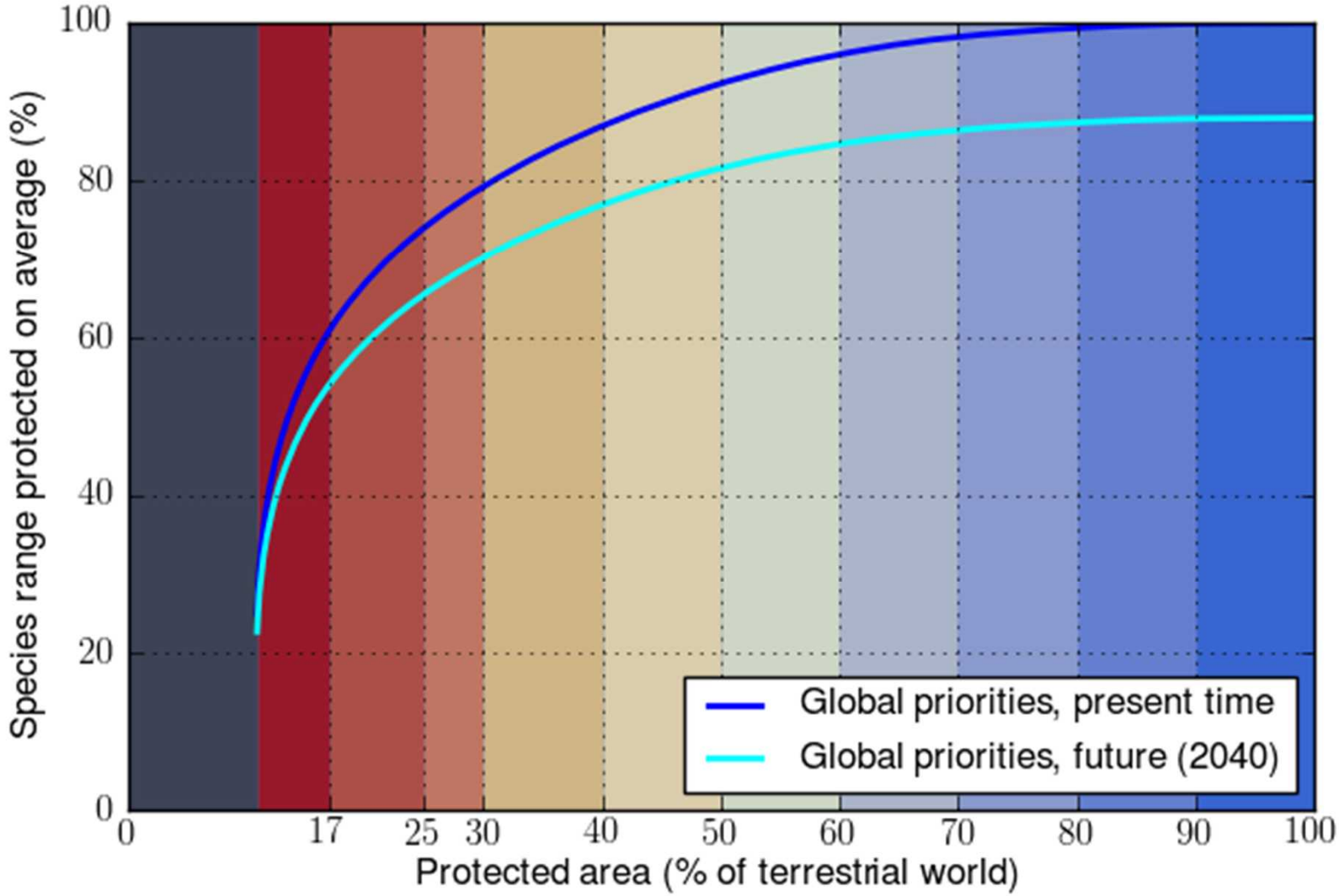
Suoriutuvuuskäyrät



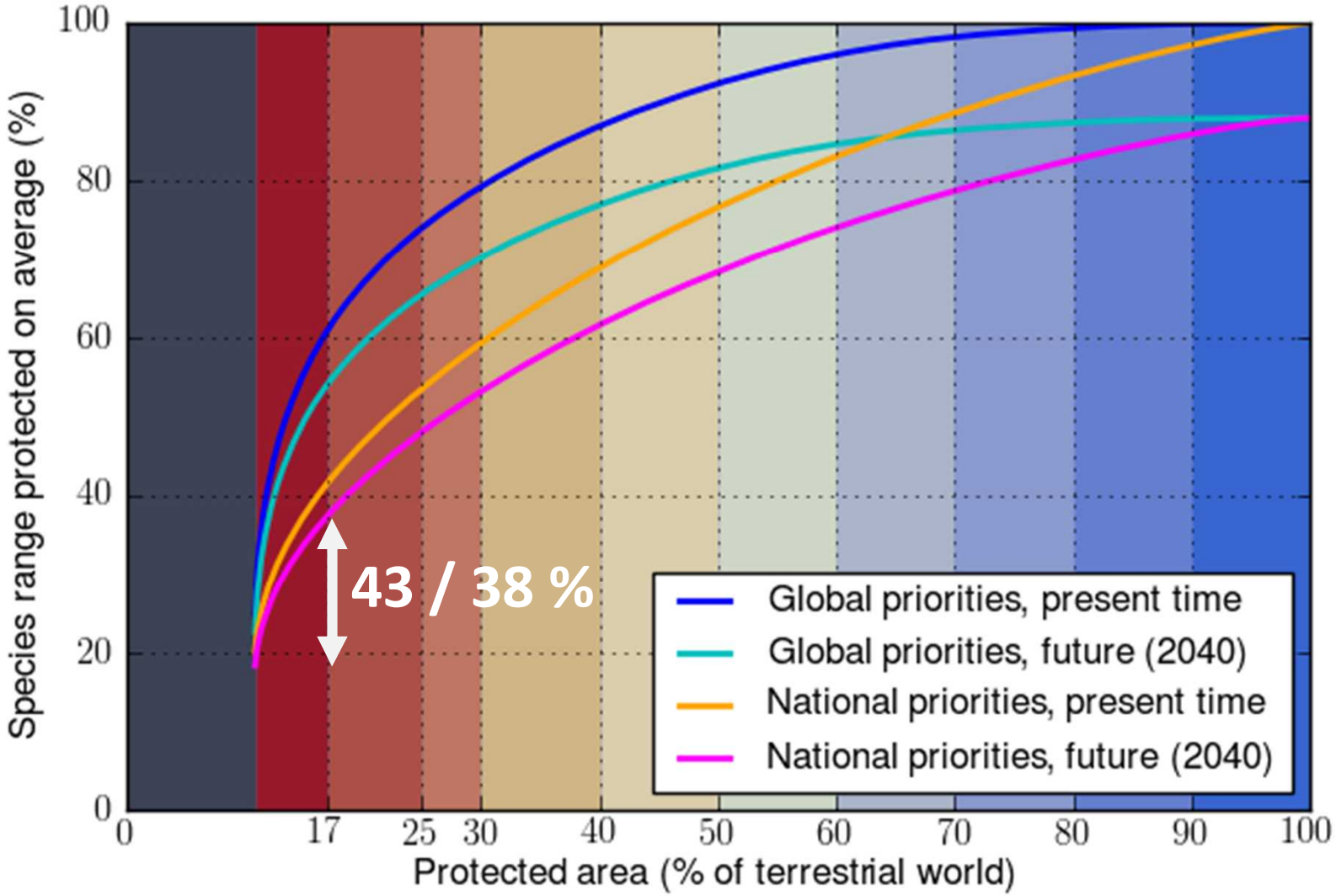
Kansallinen vai kansainvälinen?



Suoriutuvuuskäyrät



Suoriutuvuuskäyrät



Yhteenveto tuloksista

- **17 % expansion target has great potential**
- **Land use change may change conservation needs**
- **International collaboration is vital**
- **Additional conservation actions are needed**
- **Alueellisia**

- http://avaa.tdata.fi/web/cbig/gpan

Yhteenveto tuloksista

- **Tulokset ovat paikallisesti kyseenalaisia**
- **Menetelmät sallisivat alueellisesti relevantit analyysit globaalistikin – datassa puutteita**
- **Monet keskeiset aineistokokonaisuudet ilman pysyvää rahoitusta**
- **Datan jakaminen sallii tutkiskelun, tarkennukset ja kritiikin**

- http://avaa.tdata.fi/web/cbig/gpan

Global Protected Area Expansion: Creating More than Paper Parks

ENRICO DI MININ AND TUULI TOIVONEN

Aichi target 11 of the Convention of Biological Diversity promotes the expansion of the global protected area network to cover 17 percent of all terrestrial land and 10 percent of coastal and marine areas by 2020 (*www.cbd.int/sp/targets*). At the recent World Parks Congress, organized by the International Union for Conservation of Nature (IUCN) in Sydney, Australia, 12 innovative approaches were promoted as part of the "Promise of Sydney" to help transform decision-making, policy, capacity, and financing for protected areas in the next decade (*http://ic.aibs.org/syd*). The first of such approaches includes a list of 20 important recommendations to help reach conservation goals. Many of these recommendations are provided for single countries to take action individually. In addition, the final recommendation advocates that a more ambitious target of protection (50 percent global protection) should be promoted to more adequately conserve biodiversity. Both points are problematic: recent research shows that facilitating international collaboration among countries is crucial to identifying and implementing a well-connected system of protected areas that can better represent threatened biodiversity, and setting unrealistic and politically challenging global protection targets is unneeded. This Viewpoint presents three main themes of the recommendations that would benefit from greater emphasis and the promotion of the importance of international collaborations.

Improve data resources

Although sophisticated methods for identifying priority sites for protected [illegible] mostly inadequate. Identifying the best areas for protected area expansion or management actions requires comprehensive, up-to-date spatial information about species, ecosystems, and ecosystem services. Such information is often incomplete, unreliable, missing altogether, or simply unavailable at a scale that is useful for informing real-world decisionmaking. The cost and capacity needed for collecting reliable data and keeping them up to date are extremely high, particularly for less known taxonomic groups, such as invertebrates, and the marine environment. As a result, there is an immediate need to further increase funding for biodiversity data collection and capacity building, particularly in biodiversity-rich, data-poor tropical countries (see, e.g., *www.gbif.org/page/80492*). In addition, it is important that the scientific community continues to seek new ways to use novel data sources such as high-resolution remotely sensed data, citizen-science projects, and geosocial media content (Dickinson et al. 2012). Because comprehensive data are needed across administrative borders, it is of paramount importance to ensure data flow between organizations operating at different administrative levels. In addition, the long-term continuity of international data-sharing platforms, such as the Protected Planet, the IUCN Red List, the Global Biodiversity Information Facility (GBIF), and the Map of Life, should be ensured. Finally, even high-quality data sets are worthless if they are not accessible. Therefore, international funders should make sure that all relevant data sources are made openly available so that they can be [illegible]

Embrace quality

Percentage targets for protected area expansion are important to commit policymakers to biodiversity conservation. Over the last years, the global protected area estate was expanded to cover 12.5 percent of all terrestrial land and 3 percent of marine environments (Watson et al. 2014). However, 85 percent of all threatened species are still not adequately protected. Key biodiversity areas, which are the most important sites for biodiversity conservation worldwide, are also poorly represented in existing protected areas (Butchart et al. 2015). This representation crisis is even worse for marine biodiversity. A recent study, however, concluded that expanding the terrestrial protected area network to 17 percent of all terrestrial land could triple (from 19 percent to 61 percent) the coverage of all terrestrial vertebrate species listed by the IUCN if planning were carefully conducted (Montesino Pouzols et al. 2014). This would require that countries collaborate in the identification of new protected areas—as opposed to acting independently at a national scale. International collaboration would also support the creation of a well-connected system of protected areas that could facilitate species movements across landscapes and help enhance ecosystem functioning and adaptation to climate change. Importantly, identifying new protected areas internationally would make it possible to maximize species representation without having to meet additional—often unrealistic—area targets, such as protecting 30 to 50 percent of terrestrial land. The Convention on Biological Diversity [illegible]

Uudenmaan liitto
Nylands förbund

Uudenmaan viherrakenteen analysointi Zonation-menetelmällä

Uudenmaan liiton julkaisuja E 145 - 2015

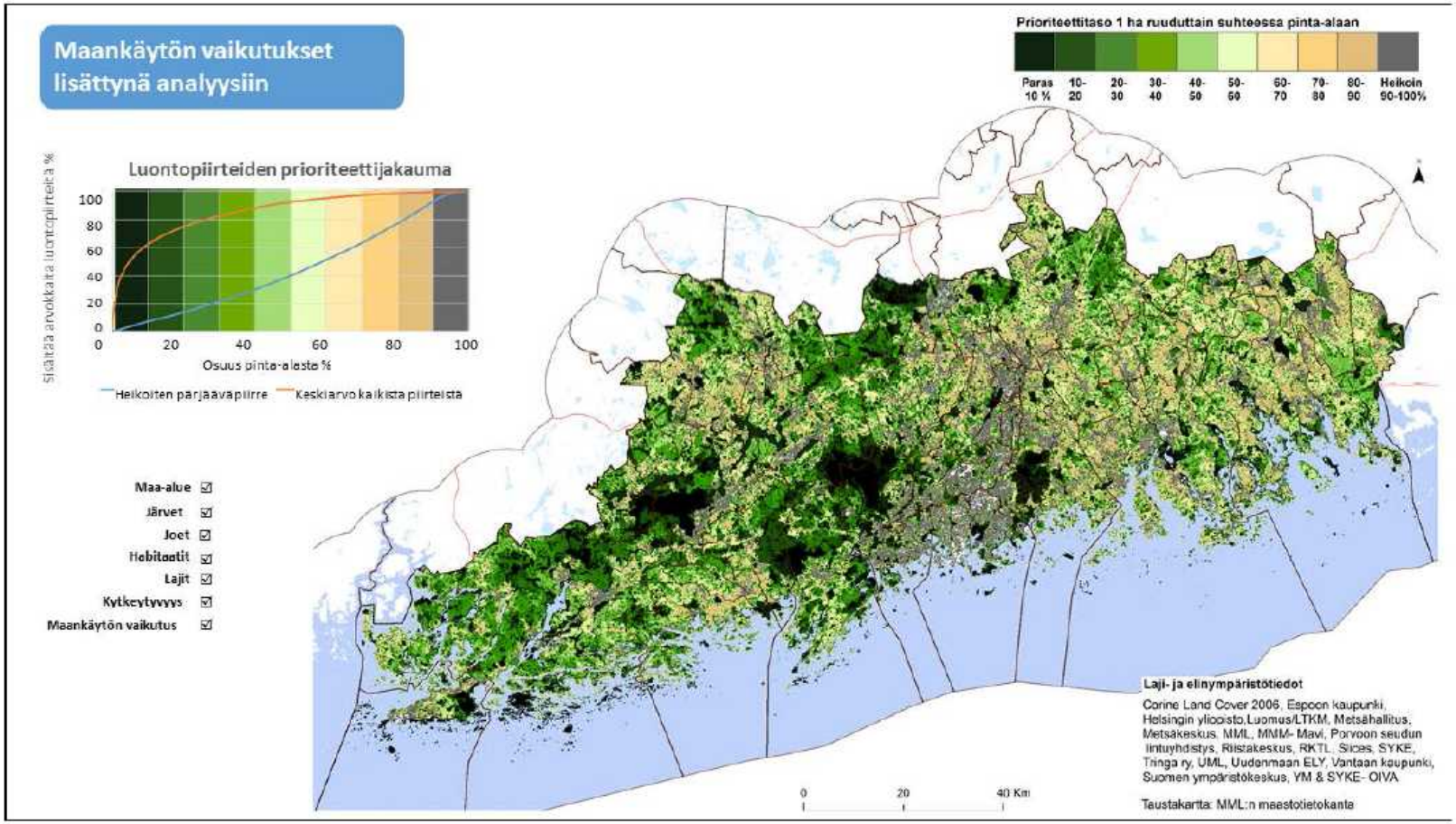
Uudenmaan liitto
Nylands förbund

Uudenmaan viherrakenteen analysointi Zonation-menetelmällä

Uudenmaan liiton julkaisuja E 145 - 2015

Vaihemaa-kuntakaavassa tärkeää tietää:

Missä arvokkaimmat viheralueet Uudellamaalla?

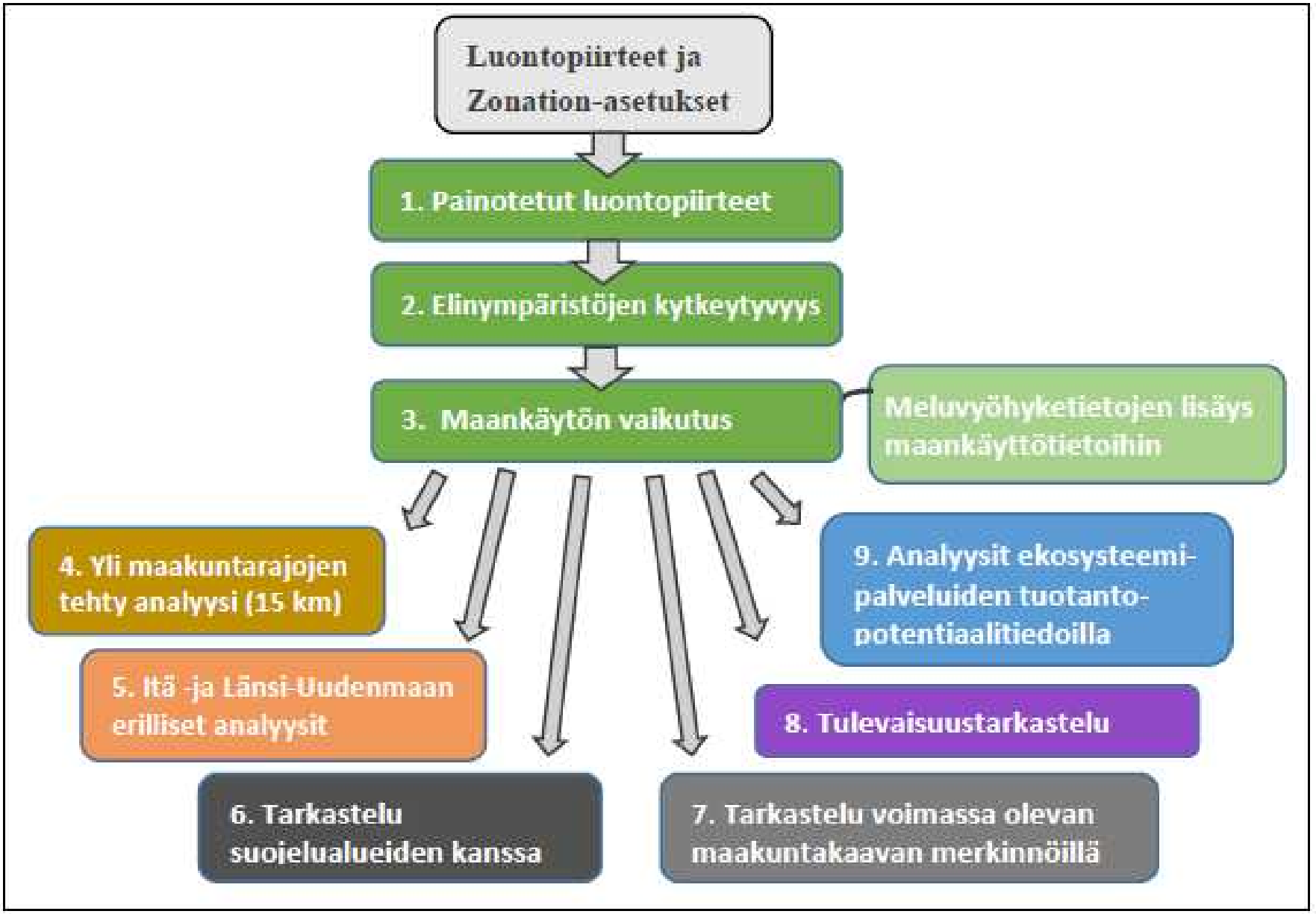


Kuva 16. Maankäytön ja kytkeytyvyyden huomioiva prioriteettitulos.

Uudenmaan viherrakenteen analysointi Zonation-menetelmällä

ZONATION
Conservation planning software

Uudenmaan liiton julkaisuja E 145 - 2015

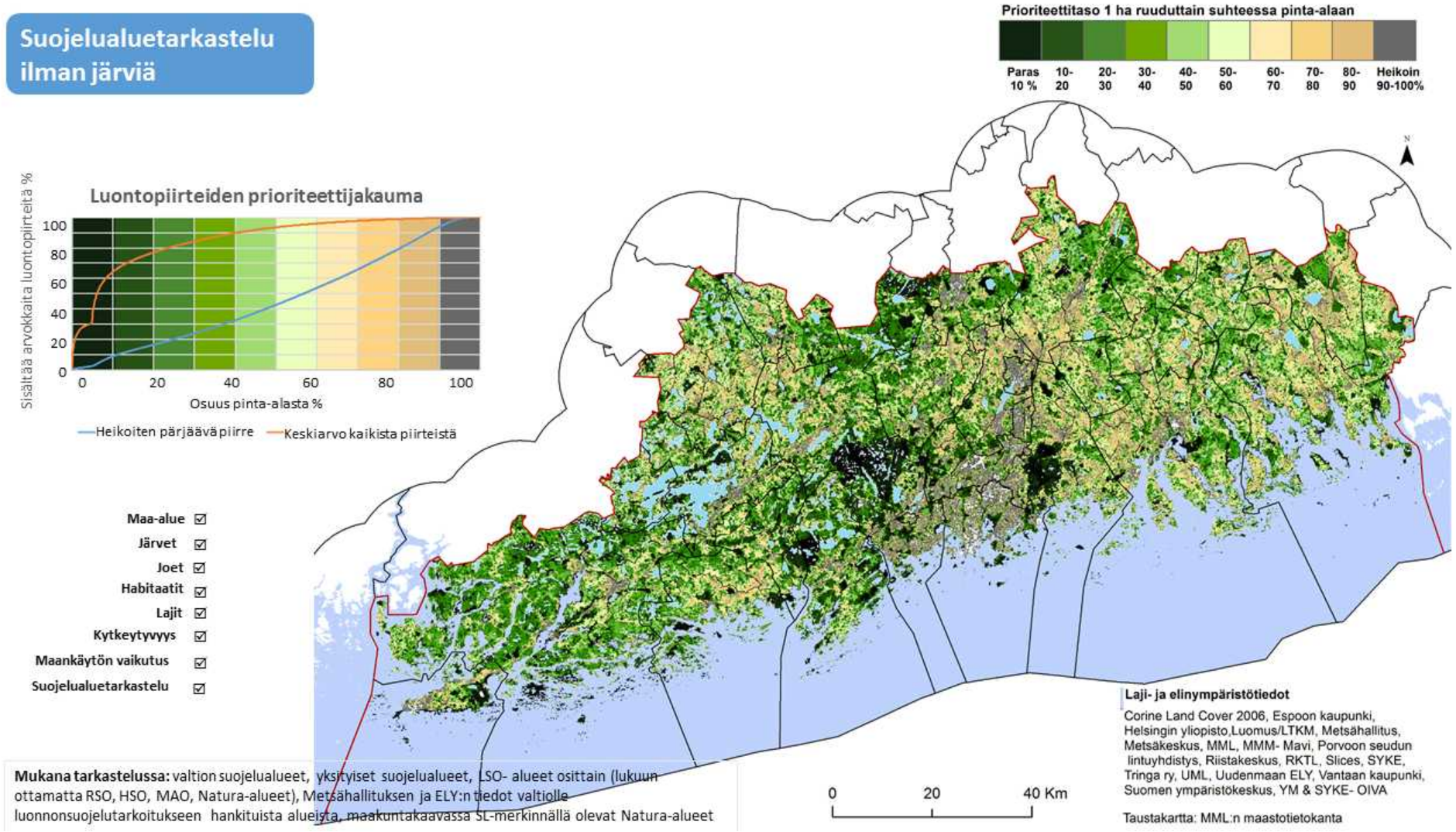


Kuva 11. Uudenmaan Zonation-analyysit.

Taulukko 2. Lähtötiedot.

1. ELINYMPÄRISTÖT	2. LAJIT
Metsäalueet • Metsävara- ja monilähde VMI -aineistoista prosessoidut indeksiaineistot, METE- kohteet, arvokkaat metsäkohteet (Metsäkeskus, Metsähallitus, Metla) **Geodiversiteetti** • Arvokkaat moreenimuodostumat, tuuli- ja rantamuodostumat ja kallioalueet (OIVA), rantahietikot ja dyynialueet (Corine Land Cover 2006, MML) • Luontotyyppitieto kallioperän kalkkiesiintymistä (SYKE) **Arvokkaat luontotyypit ja harjualueet** • Lajirikkaat harjut (SYKE) • Inventointitiedot luonnonsuojelulain luontotyypeistä (SYKE) **Maatalousalueet** • Perinnebiotoopit (ELY) • Ruohostomaat ja peltopientareet (MML:n Slices, Corine Land Cover, Mavi/MMM) • Ympäristötukialueet, maankäyttötiedot (Mavi/MMM) **Suot, vesistöt, kosteikot** • Ojittamattomat ja ojitetut suot (SYKE), suolaikkuaineisto (SYKE), soistumat (MML) • Kosteikot, lähteet, tulvamaa (Corine Land Cover, MML) • Vesistöjen ekologinen tila-luokitus (ELY) • Sisävesityyppien uhanalaisuus (ELY) • Laguunit, jokisuistot, kapeat murtovesilahdet, laajat matalat lahdet (SYKE)	**Uhanalaiset lajit** • Ympäristöhallinnon Eliölajit-tietojärjestelmän tiedot uhanalaisista lajeista IUCN-luokituksilla: "Yhden hehtaarin lajit", perhoset, liito-orava (sis. ELY:n aineistoa) • Liito-oravan pesintä- ja levähdysalueet (ELY, SYKE) **Linnut** • Maakunnallisesti, kansallisesti ja kansainvälisesti arvokkaat lintualueet (Tringa ry ja Porvoon seuran lintuyhdistys, FINIBA-ja IBA- aineistot) • Lintujen rengastusrekisteritiedot (LTKM, ELY) **Rannikko** • Merimetsokoloniat rannikkoalueella (SYKE) • Harmaa hylkeen pesintäluodot (RKTL) • Lintujen talvehtimisalueet ja muuttolintualueet (SYKE) • Zostera- merenrantaniityt (SYKE) **Suurpedot, riistatiedot** • Suurpetotiedot (RKTL) • Hirvieläinten maalaskenta-tiedot (Suomen riistakeskus Uusimaa): hirvi, valkohäntäpeura, kuusipeura, metsäkauris **Vesistölajit** • Koekalastusrekisterin uhanalaisista kalalajeista(RKTL,ELY) • Kalataloudellisesti tärkeät vesistöt ja niiden kalakanta-esiintymät, taimenjoet ja -järvet (RKTL,ELY) • Saukkotiedot (ELY, SYKE)
3. NYKYISET SUOJELUALUEET & EKOSYSTEEMIPALVELUT	**4. MAANKÄYTTÖ**
Suojelualueet ja -ohjelmat • Natura-alueet, valtion suojelualueet ja yksityiset suojelualueet (OIVA, Metsähallitus, ELY) • Luonnonsuojeluohjelma-alueet (OIVA) • Luontotyyppisuojelupäätökset (ELY) • valtiolle hankitut METSO-ohjelman alueet (Metsähallitus, ELY) **Ekosysteemipalvelut** • GreenFrame-aineistot ekosysteemipalveluiden tuotantopotentiaalista (SYKE)	**Maankäyttötiedot** • Rakennetut alueet, liikennealueet, kaatopaikat, maa-aineksen otto, turpeenotto (Corine 2006 ym. aineistot) • Ekologiselta tilalta heikot sisävesistöt (ELY) • Ympäristömelu-selvityksen paikkatietoaineisto(UML 2014) **Muu huomioitava aineisto** • Maasto- ja vesiliikenteen rajoitusalueet (OIVA) • Pohjavesien suoja-alueet (ELY) • Vihersillat, eläinten yli- ja alikulkukäytävät (ELY) **Tieto maankäytön kehittymisestä pitkällä aikavälillä** • Taajama-alueaineisto 2035 (UML)

Suojelualuetarkastelu ilman järviä



Mukana tarkastelussa: valtion suojelualueet, yksityiset suojelualueet, LSO- alueet osittain (lukuun ottamatta RSO, HSO, MAO, Natura-alueet), Metsähallituksen ja ELY:n tiedot valtiolle luonnonsuojelutarkoitukseen hankituista alueista, maakuntakaavassa SL-merkinnällä olevat Natura-alueet

Ajatuksia Uudenmaan analyysistä

- Suomessa on valtavasti ympäristöä koskevaa (paikka)tietoa, mutta edelleen se on:
  - Hajallaan eri organisaatioissa
  - Laadultaan vaihtelevaa
  - Heikosti kuvailtua
  - Sopimuskäytännöiltään hankalaa
- Tästä syystä
  - Aikaa kuluu valtavasti aineistoja etsiessä, peratessa, odottaessa ja muokatessa
  - Analyyseissä ei voida käyttää parhaita mahdollisia aineistoja
  - Menetelmiä on, aineiston järjestämisessä työtä edelleen

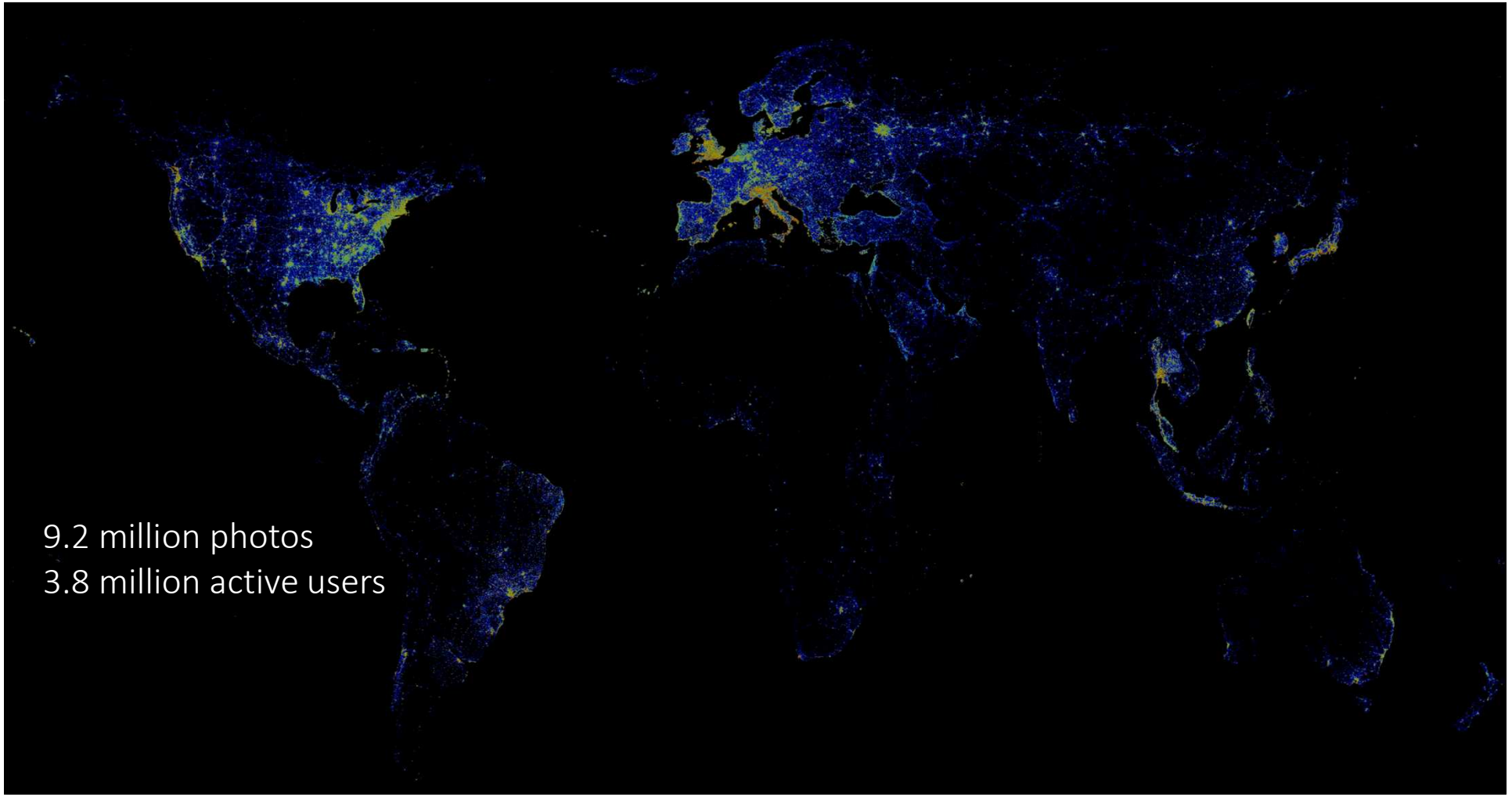
www.helsinki.fi/science/accessibility

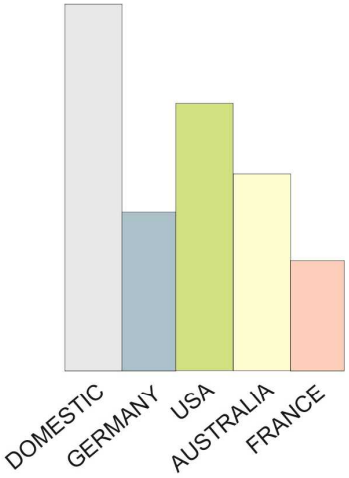
Yksi (uusi) näkökulma:
Paikallisesti kiinnostavaa aineistoa globaalilla kattavuudella:
Sosiaalinen media

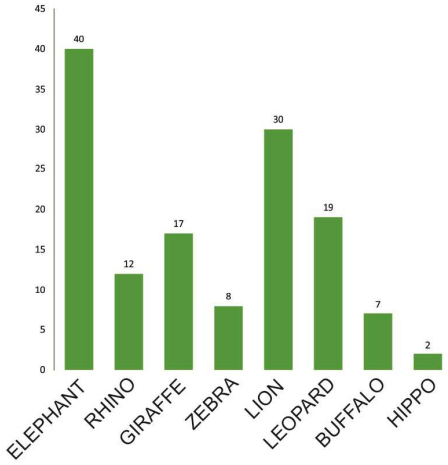
Suunnittelussa tietoa tarvitaan

Instagram

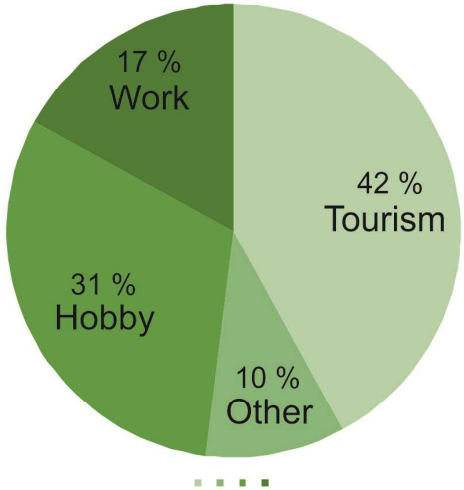
Ihmistoiminnan intensiteetin indikaattori?



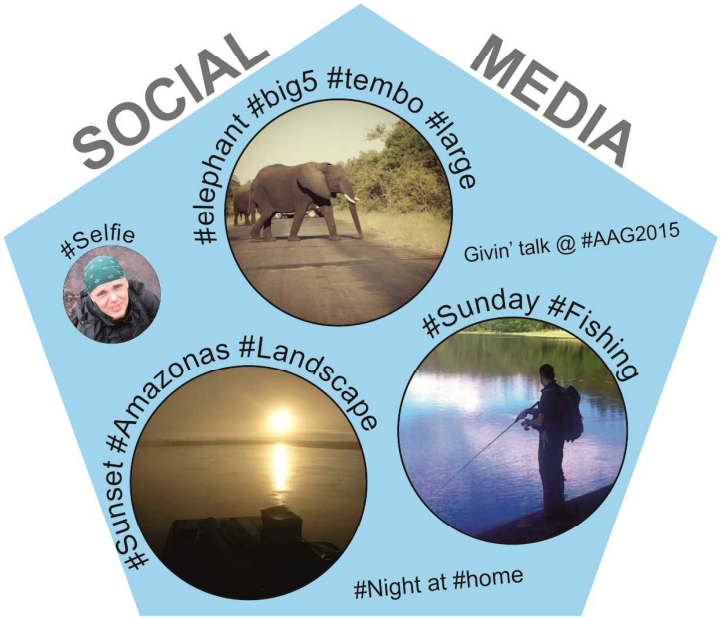




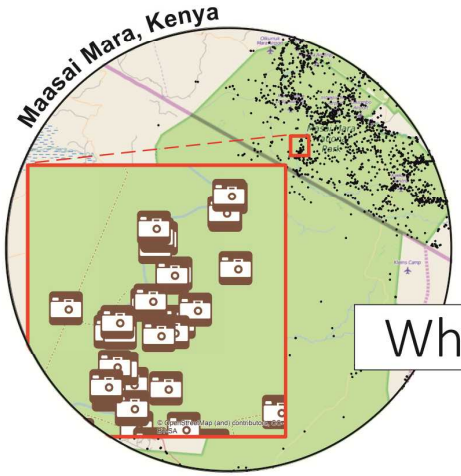
What?



Who?

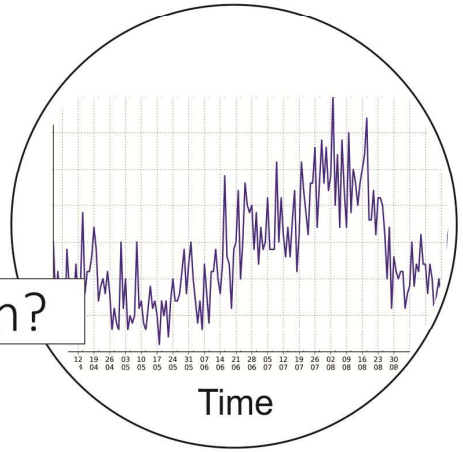


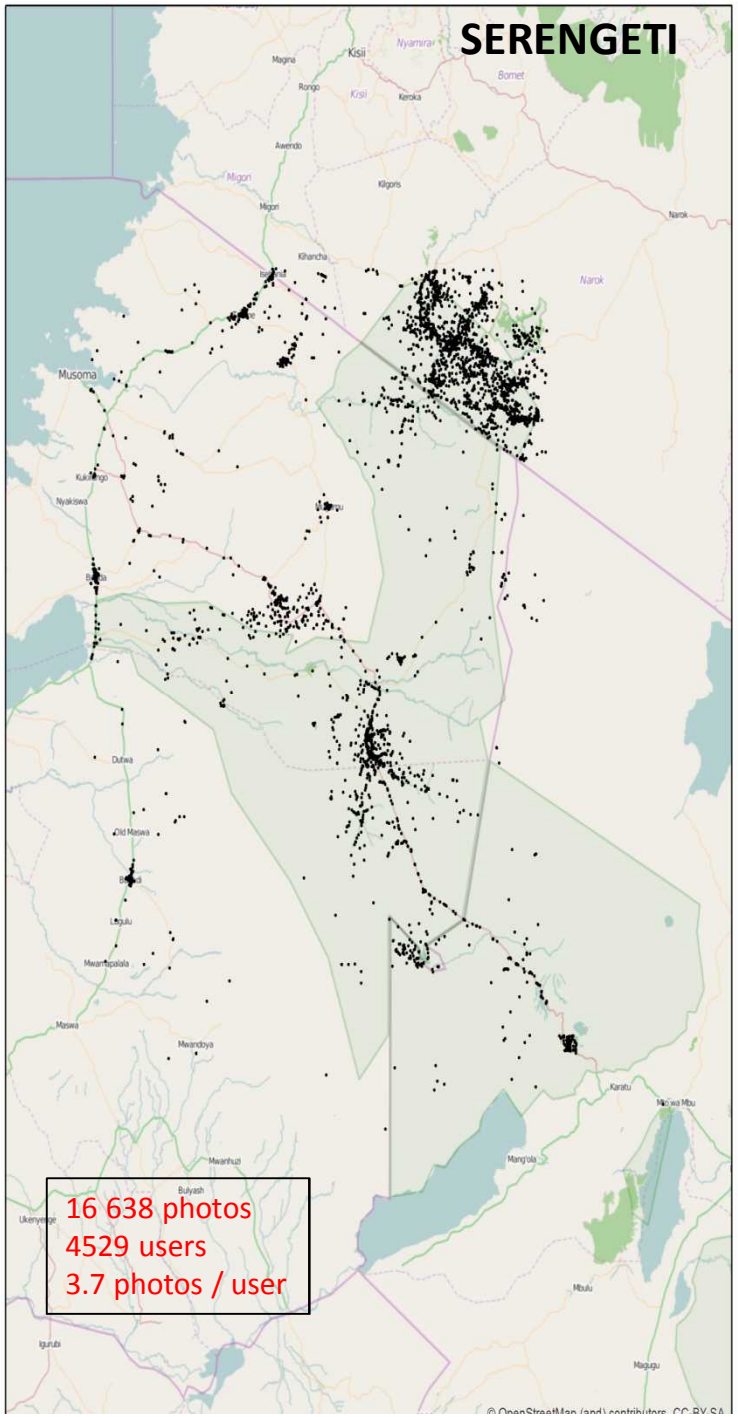
Why?

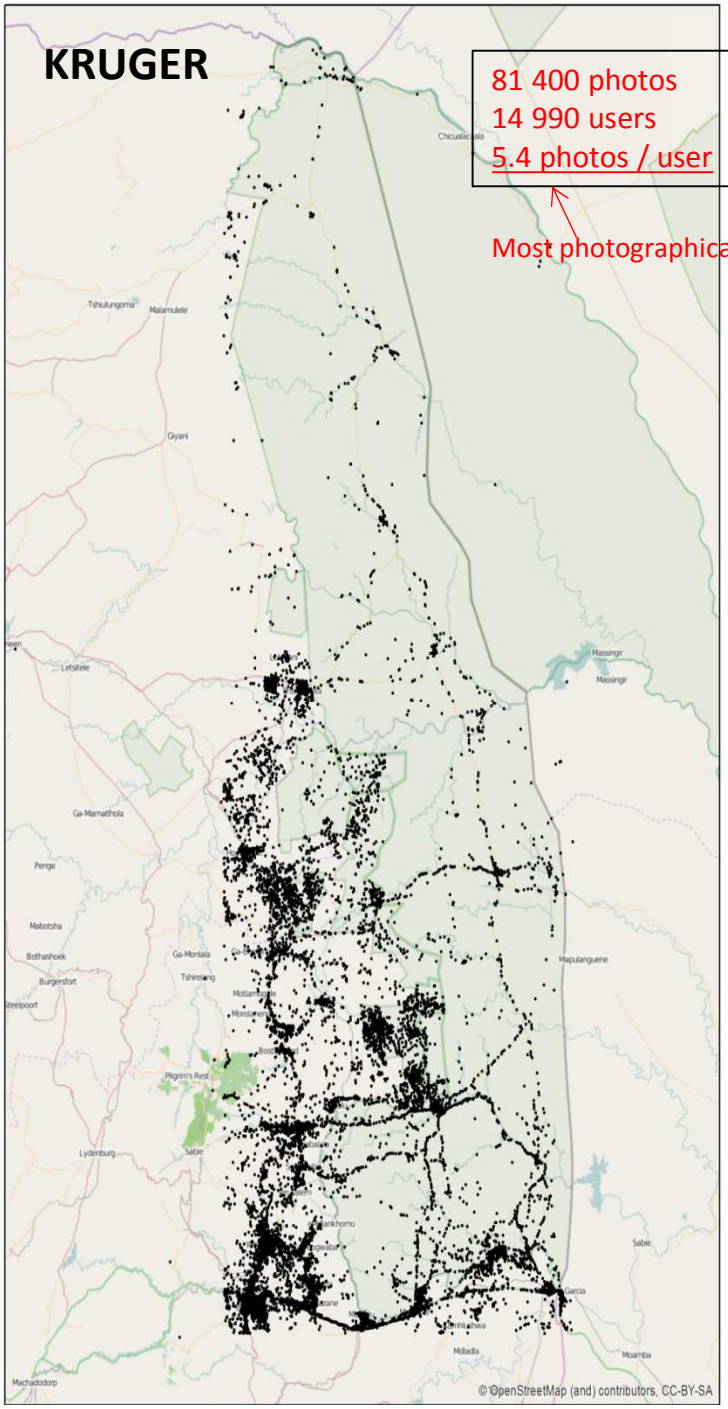


Where?

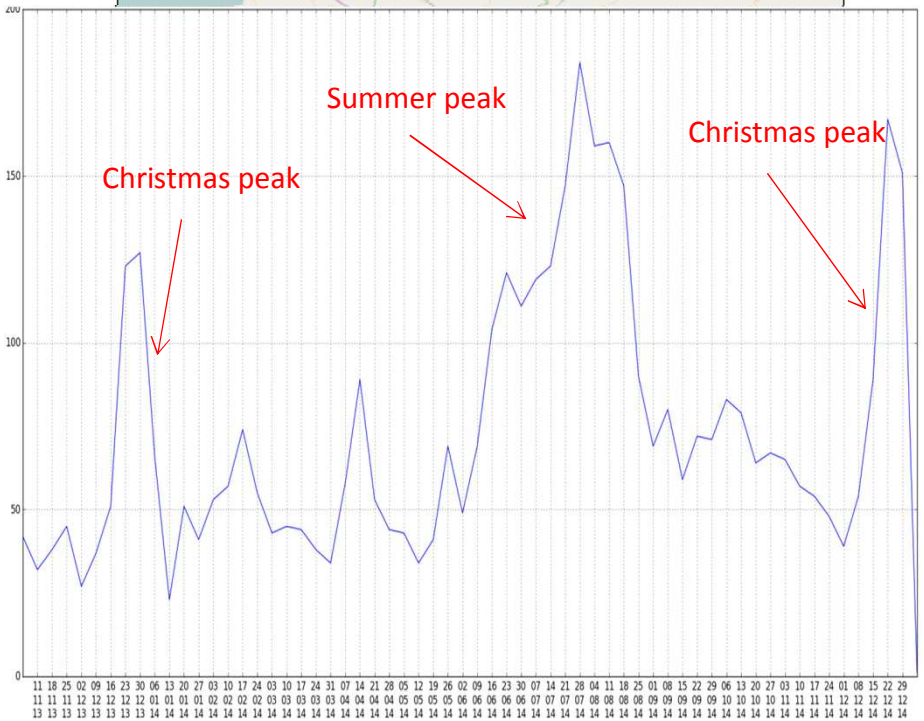
When?

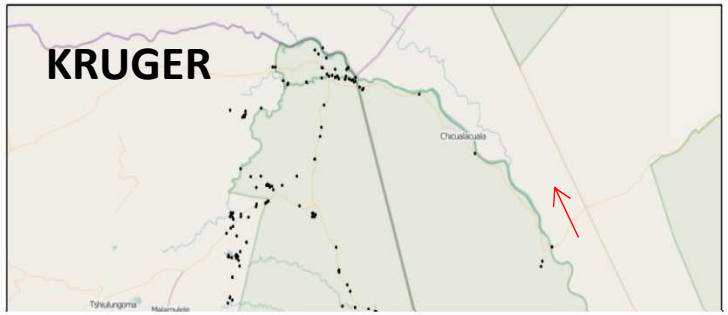


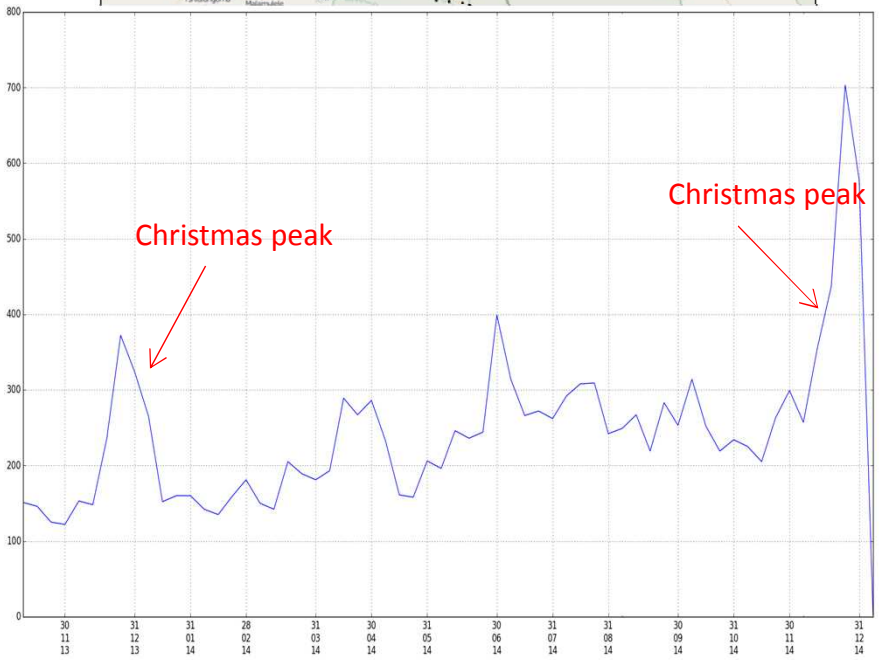

SERENGETI
16 638 photos
4529 users
3.7 photos / user

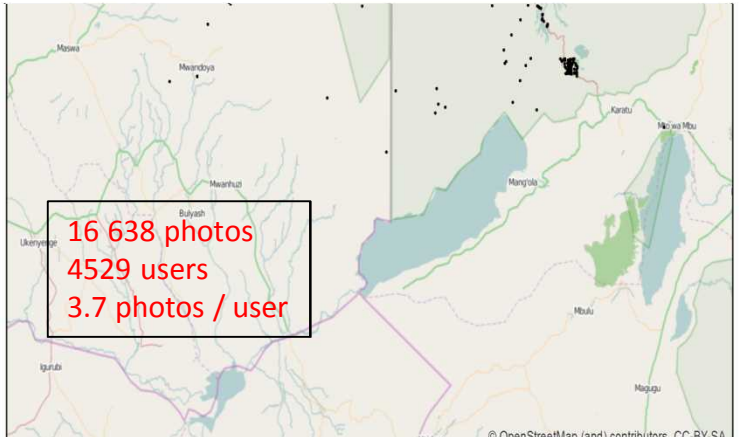

KRUGER
81 400 photos
14 990 users
5.4 photos / user
Most photographical!
© OpenStreetMap (and) contributors, CC-BY-SA

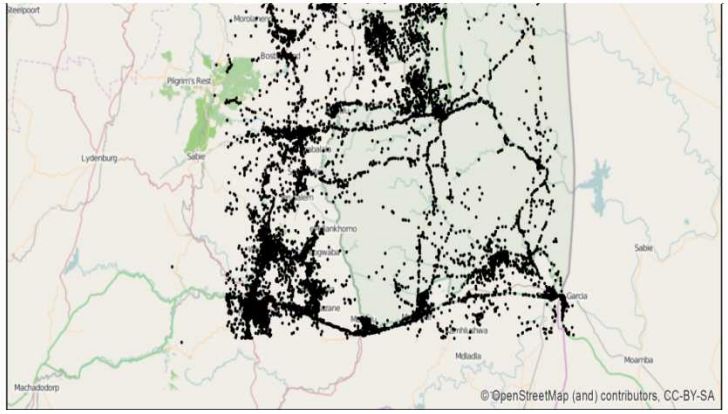

SERENGETI
Kisii
Nyamira
Bomet
Kericho
Migori
Kilgoris
Narok


Summer peak
Christmas peak
Christmas peak

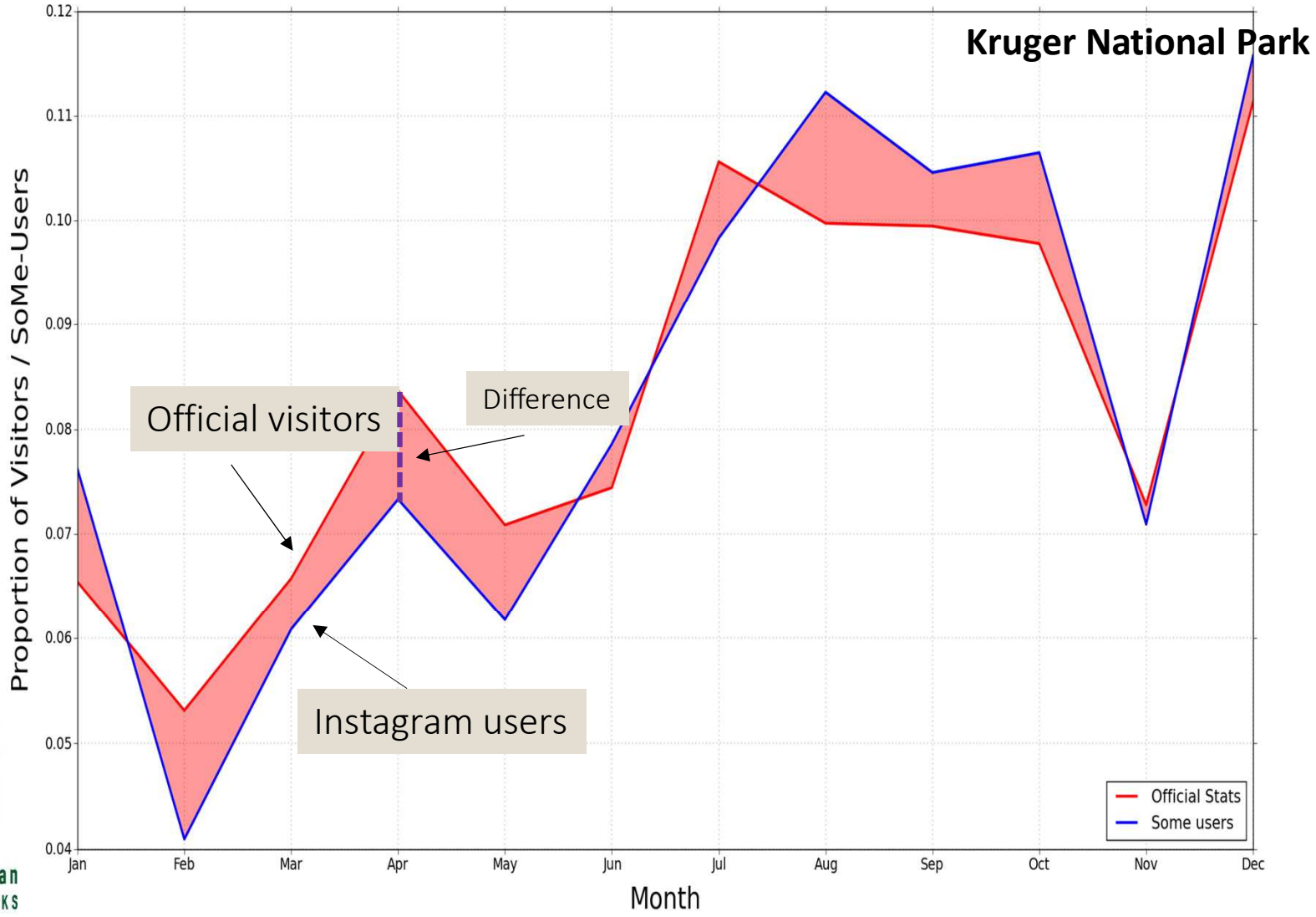

KRUGER
Chicualacuala
Tshiulungoma


Christmas peak
Christmas peak


16 638 photos
4529 users
3.7 photos / user
Maswa
Mwandoya
Karatu
Mwanhuzi
Bulyash
Mangola
Mbulu
Magugu

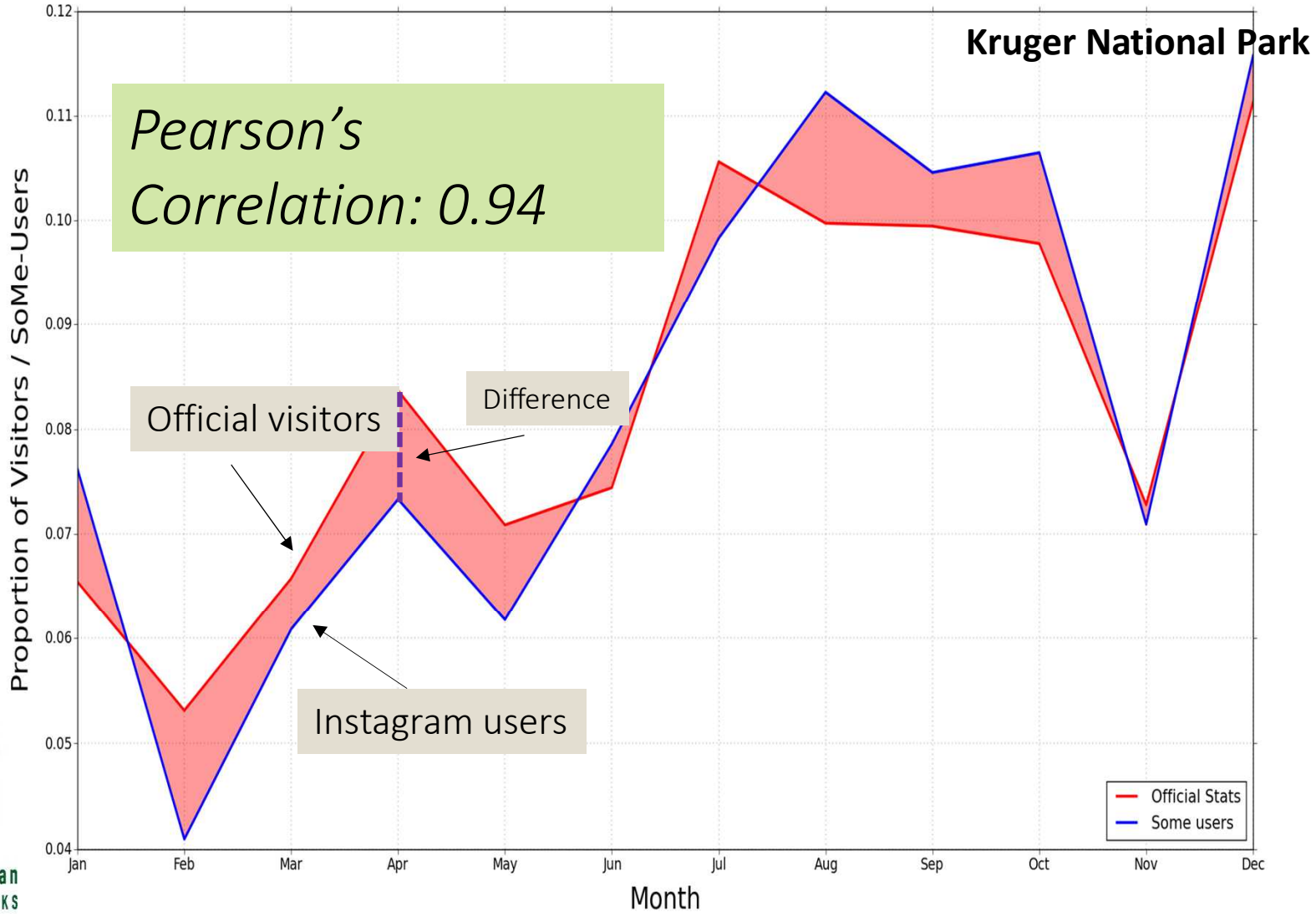

Pilgrim's Rest
Lydenburg
Sabie
Hoedspruit
Phalaborwa
Mbombela
Machadodorp
© OpenStreetMap (and) contributors, CC-BY-SA

Kuinka edustavaa data on?



South African
NATIONAL PARKS

Kuinka edustavaa data on?



South African NATIONAL PARKS

Voidaanko ihmisen toiminnan syitä ymmärtää sosiaalisen median avulla?

SOCIAL MEDIA

VS

VS

Animal Conservation

ZSL LIVING CONSERVATION

Animal Conservation. Print ISSN 1367-9430

Understanding heterogeneous preference of tourists for big game species: implications for conservation and management

E. Di Minin[1,2], I. Fraser[3,4], R. Slotow[5] & D. C. MacMillan[1]

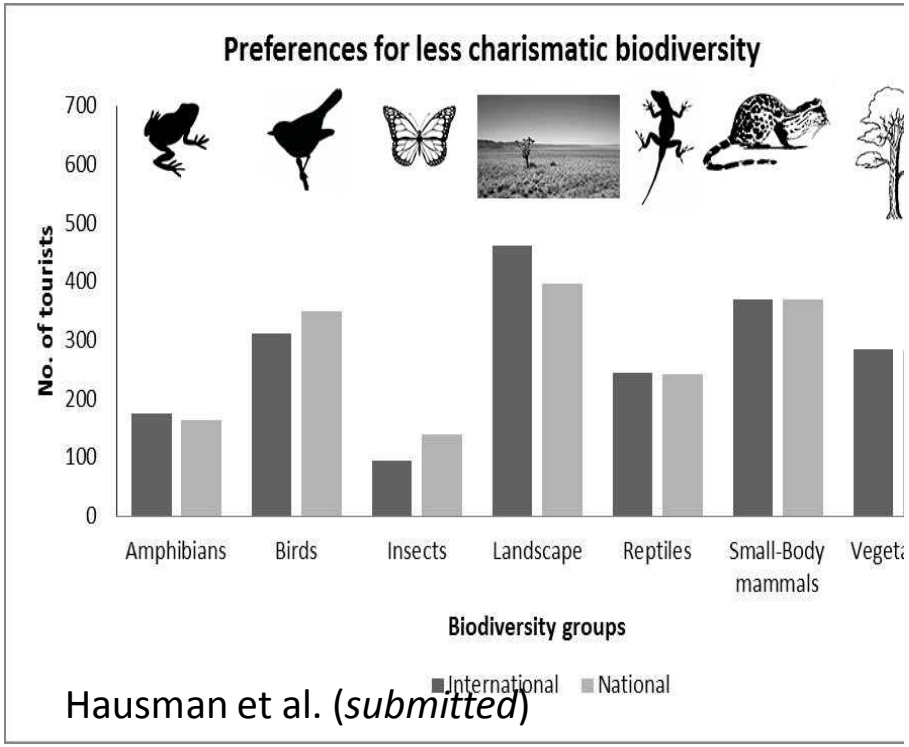
1 Durrell Institute of Conservation and Ecology, School of Anthropology and Conservation, University of Kent, Canterbury, UK
2 Finnish Centre of Excellence in Metapopulation Biology, Department of Biosciences, University of Helsinki, Finland
3 School of Economics, University of Kent, Canterbury, UK
4 School of Economics, La Trobe University, Melbourne, Vic., Australia
5 Amarula Elephant Research Programme, School of Life Sciences, University of KwaZulu-Natal, Durban, South Africa

Keywords
Big Five; charismatic; choice experiment; latent class model; marketing; nature-based tourism; segment.

Correspondence
Enrico Di Minin. Current address: Finnish Centre of Excellence in Metapopulation Biology, Department of Biosciences, PO Box 65, FI-00014 University of Helsinki, Finland.
Email: enrico.di.minin@helsinki.fi

Abstract

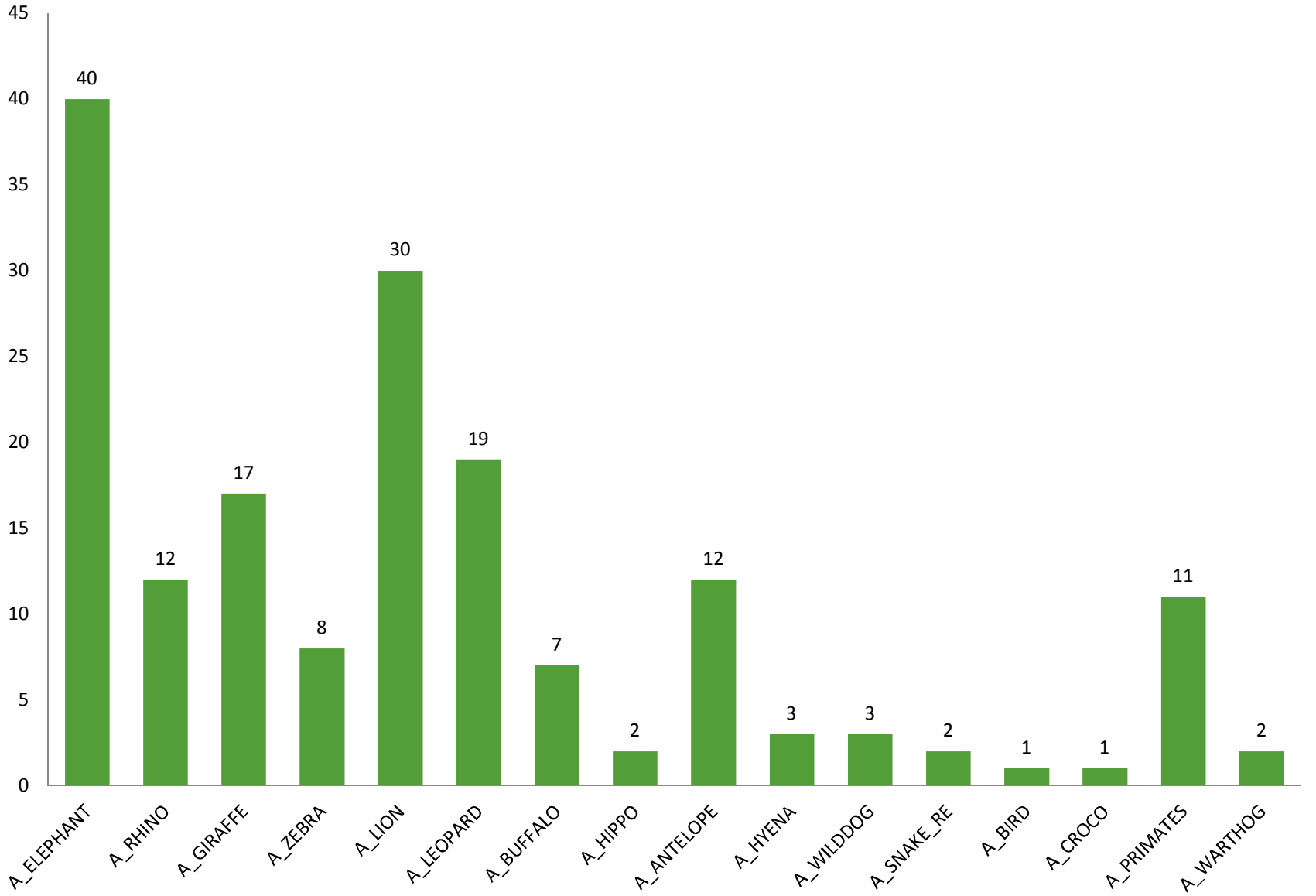
The 'Big Five' charismatic megafauna concept is considered key for financial competitiveness of protected areas in South Africa. However, this Western colonial concept is also leading to an underappreciation of wider biodiversity and the recovery of other endangered species. This study assessed the heterogeneity of tourist preferences for big game species in KwaZulu-Natal, South Africa, using a choice experiment approach, employing latent class modelling, in order to identify tourists' segments not necessarily drawn to the Big Five. The latent class segmentation identified two segments for both international and national tourists, largely defined by socio-economic characteristics. Less experienced and wealthier tourists were mostly interested in charismatic megafauna, while more experienced, but lower income tourists showed preferences for a broader range of species. Explor-



Hausman et al. (*submitted*)

+1000 haastattelua kansallispuistoissa

Suosikkeja?


45
40
35
30
25
20
15
10
5
0
40
12
17
8
30
19
7
2
12
3
3
2
1
1
11
2
A_ELEPHANT
A_RHINO
A_GIRAFFE
A_ZEBRA
A_LION
A_LEOPARD
A_BUFFALO
A_HIPPO
A_ANTELOPE
A_HYENA
A_WILDDOG
A_SNAKE_RE
A_BIRD
A_CROCO
A_PRIMATES
A_WARTHOG

Lopuksi

- Maankäytön suunnittelun työkalut ovat datanälkäisiä ja informatiivinen lopputulos edellyttää hyviä aineistoja
- Hyvät globaalit aineistot voisivat tukea päätöksentekoa myös paikallisemmin
- Uudet aineistolähteet saattavat tarjota jotakin uutta monella mittakaavatasolla, mutta vaativat kapasiteettia
- Datan avausten ja infrastruktuuriprosessien aikakaudellakin aineistot ovat edelleen pullonkaula, myös Suomessa


Kiitos!
SAA
OTTAA!
www.helsinki.fi/science/accessibility/