DESIGN BOOK

B. ALEXANDER SIMMONS, PH.D.

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About Me

Before I was a scientist, I was an artist, known as "Blooke." Inspired by Stina Persson, Salvador Dalí, and Leonardo da Vinci, I loved merging the abstract and the figurative through mixed media. At just 13 years old, I was lucky enough to have one of my drawings featured in the Nelson-Atkins Museum of Art in Kansas City, Missouri. Prior to university, however, I had a difficult decision to make: do I pursue a career in art or in science? Ultimately, the thought of a more reliable income propelled me to pursue life as a scientist, with art as an enjoyable hobby.

Life as a traveling researcher, however, made it difficult to find time, money, and space that I could allocate to this passion of mine. After living out of two suitcases for four years, I realized that I could satisfy my artistic cravings while delivering more accessible creations that could actually prove useful for the scientific community – through graphic design.

Art & Science

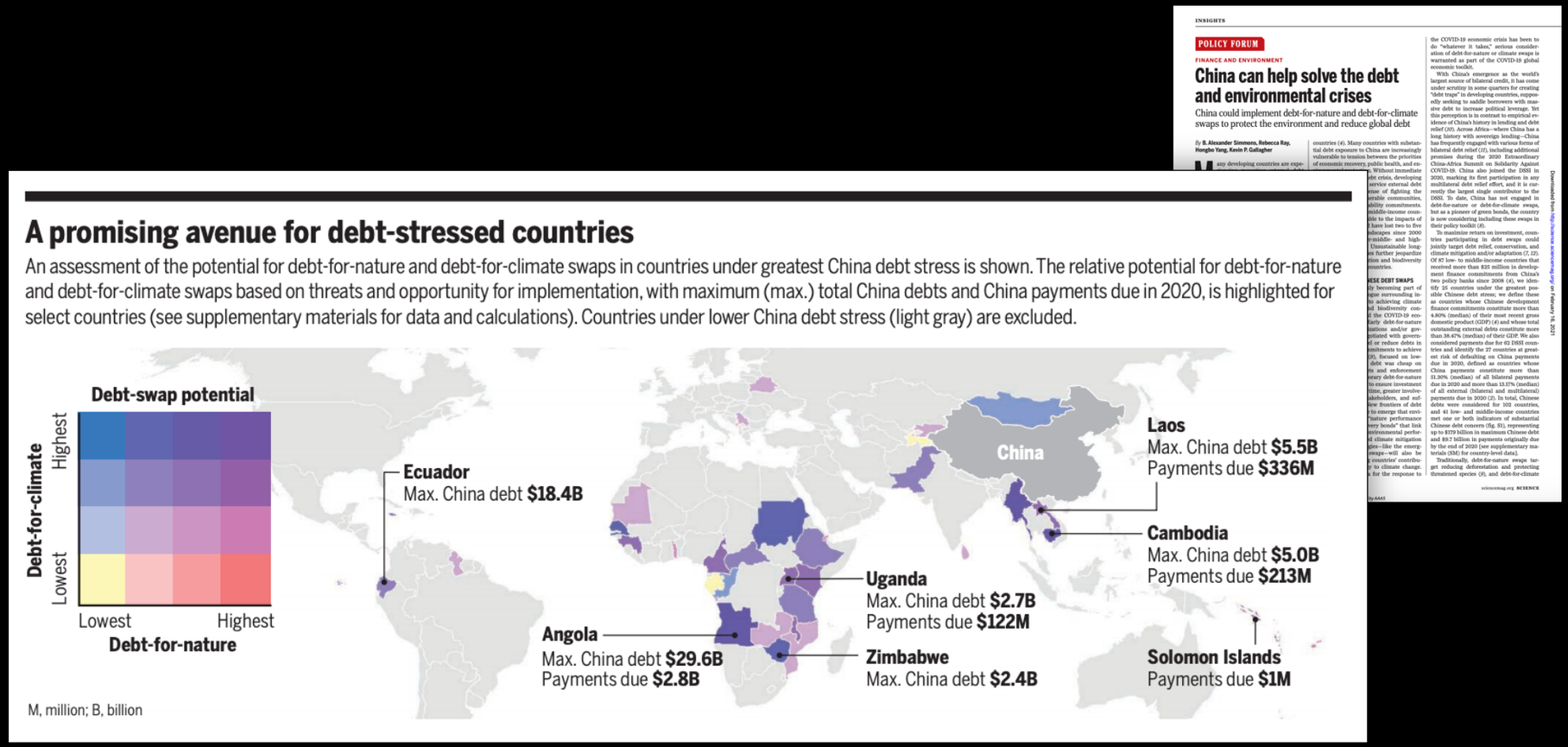
Art plays an important and frequently undervalued role in science. As any student of molecular biology will tell you, a good visualization can dramatically enhance comprehension of even the most complex phenomena. With so many people classified as visual learners, we must take our visualizations of scientific data seriously to maximize reader engagement, comprehension, and ultimately the impact of our research.

As both an artist and a scientist, I work with researchers around the world to design high-impact figures based upon the most basic tenet of art: storytelling. From color theory to instrumentalism, I use my knowledge to help researchers:

1. Emphasize their message;
2. Clarify their message;
3. Simplify their message; and
4. Present their message effectively

Featured Publications

My designs have been featured in dozens of academic journals, including *Science*, *Nature Communications*, *Nature Ecology & Evolution*, and the inaugural issue of *One Earth*. My knowledge of publication-quality figure formats, sizing, and resolutions will help you cut down on the post-acceptance stress from figure preparation.



nature COMMUNICATIONS

COMMENT

https://doi.org/10.1038/s41467-020-15870-0 OPEN

Opportunities for big data in conservation and sustainability

Rebecca K. Runting[1,2], Stuart Phinn[2], Zunyi Xie[2], Oscar Venter[3] & James E. M. Watson[2,4]

Big data reveals new, stark pictures of the state of our environments. It also reveals 'bright spots' amongst the broad pattern of decline and—crucially—the key conditions for these cases. Big data analyses could benefit the planet if tightly coupled with ongoing sustainability efforts.

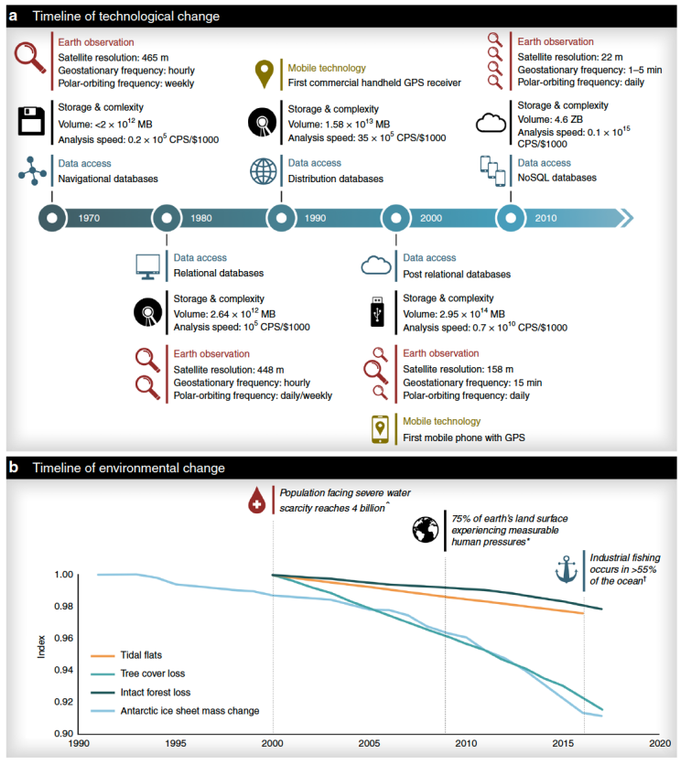


Fig. 1 Timeline of selected technological and environmental changes. (**a**) The volume of data produced has grown exponentially and is expected to soon reach 40 Zettabytes (40 trillion Gigabytes). Such data generation is only possible due to the concurrent growth in data storage and computing speed, which has moved from the floppy disk (~1 calculations per second per $1000) to cloud-based storage (>10^{15} calculations) in last 30 years[1]. Despite this exponential growth in technological capacity, and increasing environmental applications, our planet is still facing serious environmental declines (**b**). All environmental declines shown are sourced from prior studies (as detailed below) and are indexed relative to their state in the first year plotted (i.e., dividing by the first value in each time series), with the exception of Antarctic ice sheet mass change[2], which was indexed against expected (BAU) loss by 2100 (81 cm sea-level rise equivalent[3]). Tidal flats represent the overall decline across the globe for time period, and does not show annual fluctuations[4]. Intact Forest Landscapes and tree cover loss does not take into account gains[5,6]. Note the index on the *y*-axis is only shown for the range 0.9–1. †Data from Global fishing watch[7]. *Based on the global human footprint[8]. ^For at least 1 month a year over the period 1996–2005[9].

nature ecology & evolution PERSPECTIVE https://doi.org/10.1038/s41559-018-0490-x

The exceptional value of intact forest ecosystems

James E. M. Watson[1,2,15]*, Tom Evans[2,15], Oscar Venter[3], Brooke Williams[1,2], Ayesha Tulloch[1,2], Claire Stewart[1], Ian Thompson[4], Justina C. Ray[5], Kris Murray[6], Alvaro Salazar[7], Clive McAlpine[7], Peter Potapov[8], Joe Walston[9], John G Robinson[9], Michael Painter[9], David Wilkie[9], Christopher Filardi[9], William F. Laurance[10], Richard A. Houghton[11], Sean Maxwell[1], Hedley Grantham[1,2], Cristián Samper[9], Stephanie Wang[9], Lars Laestadius[11], Rebecca K. Runting[1], Gustavo A. Silva-Chávez[12], Jamison Ervin[13] and David Lindenmayer[14]

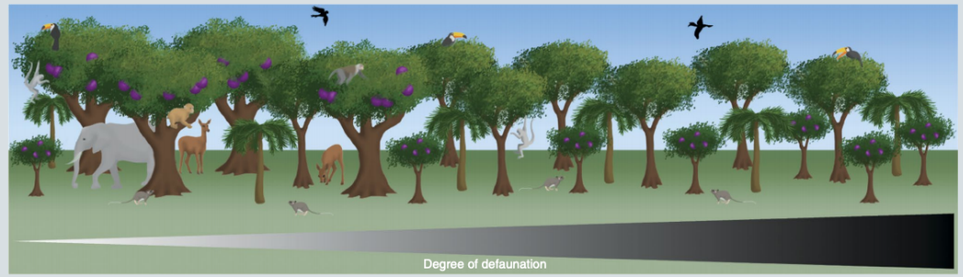
As the terrestrial human footprint continues to expand, the amount of native forest that is free from significant damaging human activities is in precipitous decline. There is emerging evidence that the remaining intact forest supports an exceptional confluence of globally significant environmental values relative to degraded forests, including imperilled biodiversity, carbon sequestration and storage, water provision, indigenous culture and the maintenance of human health. Here we argue that maintaining and, where possible, restoring the integrity of dwindling intact forests is an urgent priority for current global efforts to halt the ongoing biodiversity crisis, slow rapid climate change and achieve sustainability goals. Retaining the integrity of intact forest ecosystems should be a central component of proactive global and national environmental strategies, alongside current efforts aimed at halting deforestation and promoting reforestation.

Box 2 | The effect of defaunation on carbon storage and sequestration in intact forests

Even where forests have not been cleared, many are not functioning as they once were[166]. Species such as the Asian and South American tapirs (*Tapirus* spp.), forest elephant (*L. cyclotis*) and the great apes have disappeared across much of their ranges. Habitat degradation and fragmentation are major causes of this defaunation, as many large-bodied species depend on great expanses of high-quality forest to sustain viable populations[5,192]. Increased human accessibility to forests is another, with unsustainable hunting now affecting greater areas of tropical forest than the combined extent of deforestation, selective logging and wildfires[193]. Wildlife species are not equally affected by hunting, with stronger impacts of hunting pressure on larger-bodied primates and ungulates compared with smaller-bodied vertebrates such as birds and rodents[31,75,194].

Defaunation significantly erodes key ecosystem services and functions through direct and indirect cascading effects on species diversity and trophic webs[195–197]. There is evidence for negative effects on pollination, seed dispersal, pest control, nutrient cycling, decomposition, water quality and soil erosion[192,198]. Studies across the African and Atlantic tropical forests indicate that the disappearance of large frugivores and subsequent loss of seed dispersal reduces recruitment and natural regeneration of large-seeded hardwood plant species, which are key contributors to carbon storage[199–201]. By simulating the local extinction of trees that depend on large frugivores in 31 Atlantic forest communities, one study[29] found that defaunation has the potential to significantly erode carbon storage even when only a small proportion of large-seeded trees are extirpated. This is because of strong functional relationships between seed diameter, wood density and tree height, which are traits related to carbon storage[202]. Similar results have been shown for the Amazon[31] and other parts of the tropics[203].

There is also likely to be another link between defaunation and lowered carbon storage in tropical forests; lower herbivory rates in defaunated forests allow fast-growing herbivore-sensitive plants to outcompete slower-growing animal-dispersed trees that have better defence mechanisms against hunted frugivores[31,204,205]. In defaunated forests, carbon storage is potentially reduced when these fast-growing carbon-poor plants replace an equal basal area of carbon-rich animal-dispersed trees[206] — a process that may be irreversible once the seed stock is lost.



Schematic representation of the transition (from left to right) of a non-hunted, faunally intact tropical forest to an overhunted, defaunated forest. Shown is the degree to which large arboreal or terrestrial forest frugivores such as elephants and apes decline in abundance and, with these declines, the associated replacement of large-fruited high-biomass trees by smaller-fruited and wind-dispersed trees that have lower biomass and carbon storage. Credit: Blake Alexander Simmons.

One Earth
Perspective

Shortfalls in Conservation Evidence: Moving from Ecological Effects of Interventions to Policy Evaluation

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https://doi.org/10.1016/j.oneear.2019.08.017

Conservation of biodiversity and ecosystem services in natural environments requires careful management choices. However, common methods of evaluating the impact of conservation interventions can have contextual shortcomings. Here, we make a call for counterfactual thinking—asking the question "what would have happened in the absence of an intervention?"—with the support of rigo
more thoughtful consideration of human dimensions and behavior. We revie
ation approaches and highlight the advantages of counterfactual approa
We also illustrate how even robust estimates of ecological impact can fail to
policy interventions. The latter depend importantly on human preferences a
incentives that cannot be captured by studies of ecological impact. We prop
that all evaluations can implement now to immediately improve their credib

Introduction

As summarized by the IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) global assessment report on biodiversity and ecosystem services, nature embodies a variety of concepts including biodiversity, ecosystems, and systems of life.[1] Collectively, it is agreed that nature and nature's contributions to human life (e.g., food, water, and clean air) are vital to human life and well-being. However, indicators show that biodiversity and ecosystem services are globally in decline,[2] demonstrating an urgent need for increased conservation efforts. To address these declines, varied conservation efforts are needed[3] that can address diverse causes of decline. This includes efforts to address protection of nature as well as restoration of degraded habitats. Understanding the conservation context and selecting an appropriate intervention to address biodiversity declines broadly requires stating a goal, understanding the threats, and identifying an intervention that reduces these threats to achieve the goal.[4] However, threats to biodiversity are varied, so required interventions are equally diverse. They include protection, restoration, law and policy, incentive programs, and education and awareness campaigns.[5] An improved understanding of the impact of conservation interventions is needed so that limited conservation funds can be better targeted to maximize biodiversity outcomes. This can be achieved by building a clear evidence base of what conservation interventions have worked, then translating the evidence into new contexts to design effective future interventions.

The first calls for empir
tion investments are mor
evaluations in other fiel
routinely apply counterfa
of quasi-experimental m
Counterfactual analysis
causal inference by aski
absence of an interven
mechanisms underlying t
comes and considering
tions, including bias in pa
partners are like for lik
analysis requires consid
to ecological studies, e
from and anticipating ho
identification of confoun
vention failure or exagge
ecological studies. This h
to consider heterogeneo
most appropriate interve
between strict or less str
Conservation of Nature I
fected areas"). Once thes
theory of change or caus
design approaches, such
first and intervention sam
Traditional evaluation s
evidence for the benefits
repeated projects in simi

One Earth
Perspective

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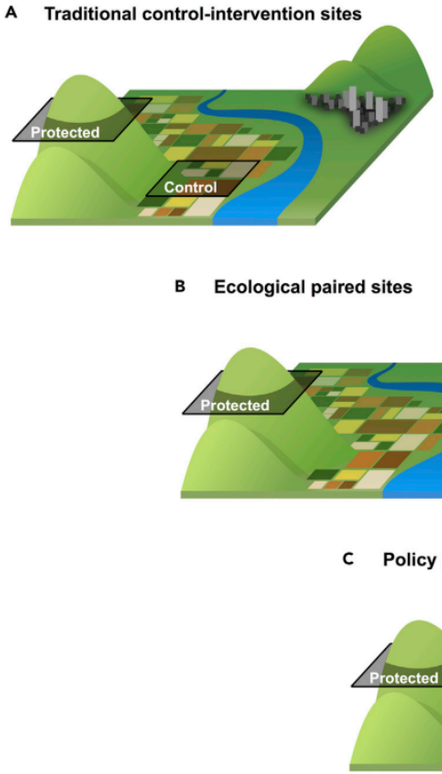


Figure 1. Comparison of a Traditional Control-Intervention Design with a Matched Ecological Design and Matched Policy Evaluation Design for Measuring the Impact of a Protected Area in Avoiding Clearing

For a Figure360 author presentation of this figure, see https://doi.org/10.1016/j.oneear.2019.08.017. Figure360▷

(A) A traditional control-intervention design would select spatially adjacent sites to account for environmental confounding factors (e.g., exposure to climate conditions, shared biophysical traits). For example, historical studies have selected adjacent sites within a 10 km buffer of protected areas.[21,29] This approach includes obvious sources of bias. For example, spatially adjacent sites do not necessarily share social confounding factors; for example, adjacent unprotected sites might be flatter and thus more exposed to clearing, resulting in an overestimate of the impact of the protected area.[21,29]

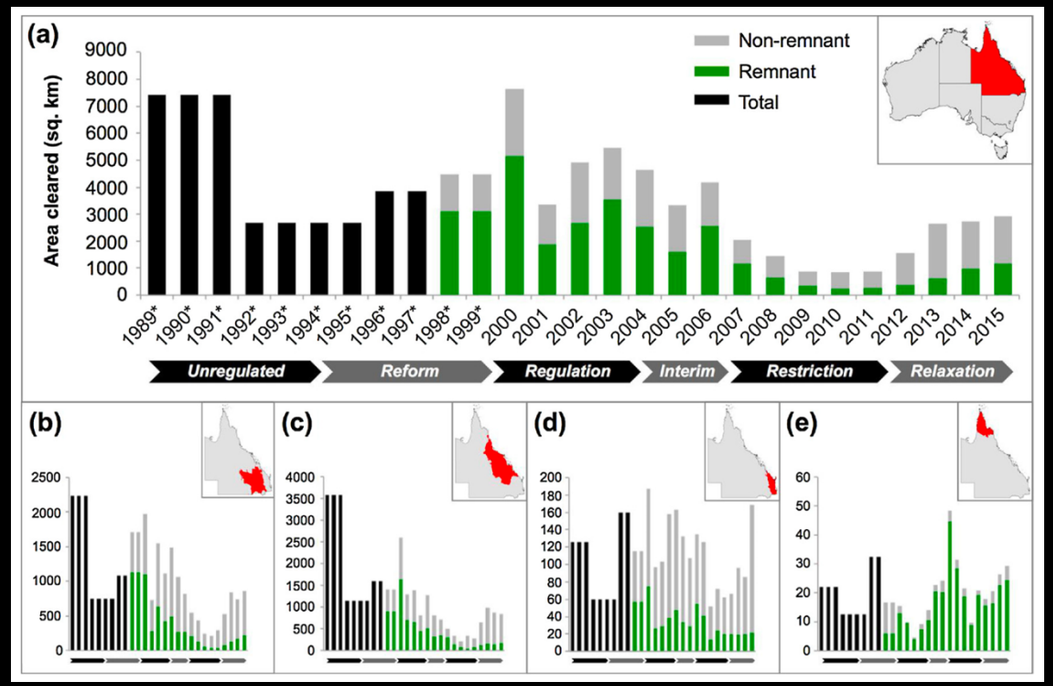
(B) Ecological evaluation approach using counterfactual thinking includes considerations of ecological confounding factors such as vegetation type and slope, thereby selecting spatially distant sites that control for these factors but still retain obvious social bias.

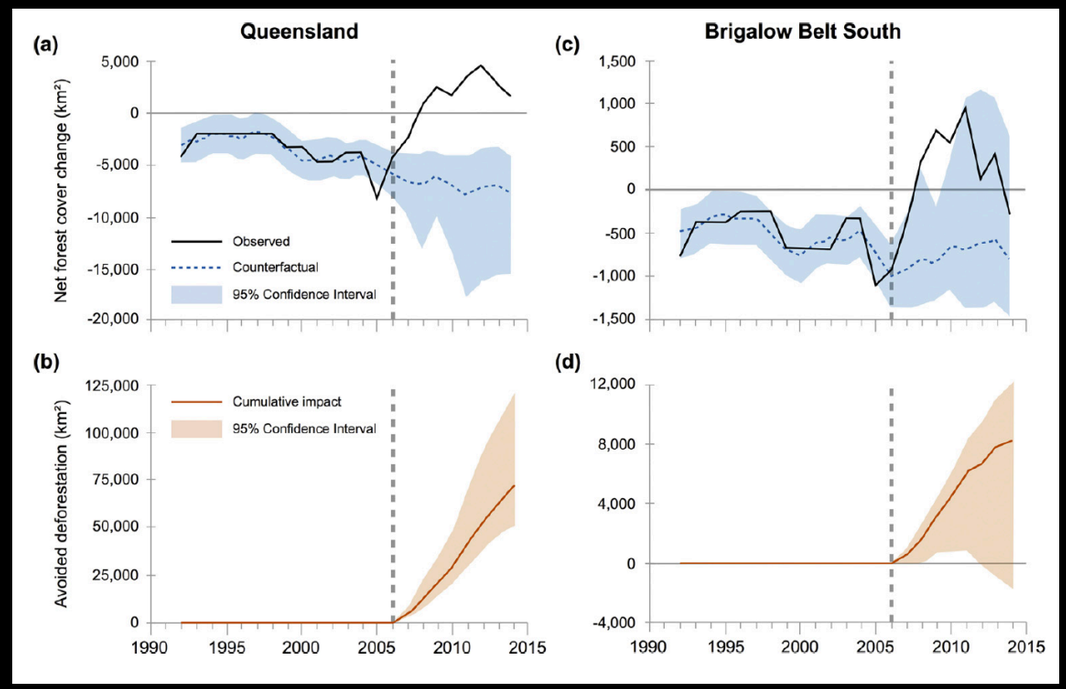
(C) Policy evaluation approaches using counterfactual thinking include considerations of social confounding factors, thus selecting sites that match both environmental and social factors.

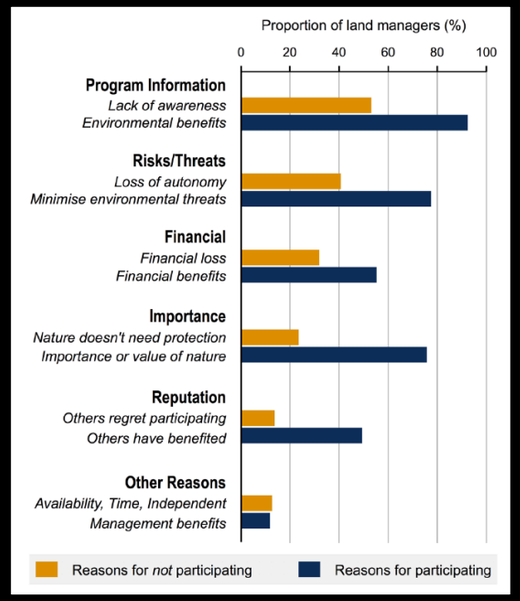
by interdisciplinary groups or applied economists.[7,14–22] The majority of evaluations in practice still rely on simple before-after or control-intervention approaches (discussed in detail in the

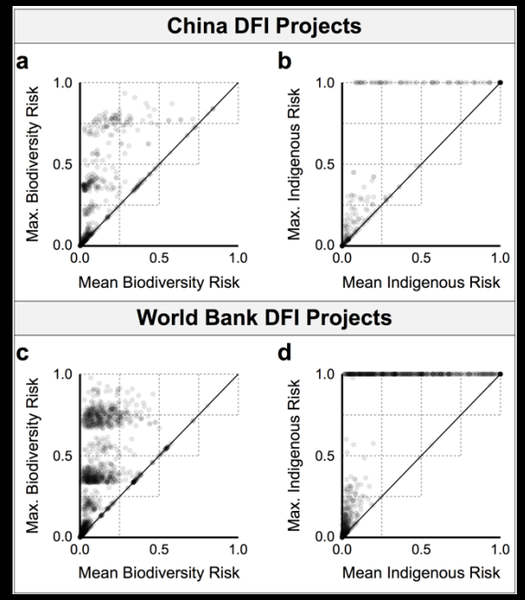
Graphs

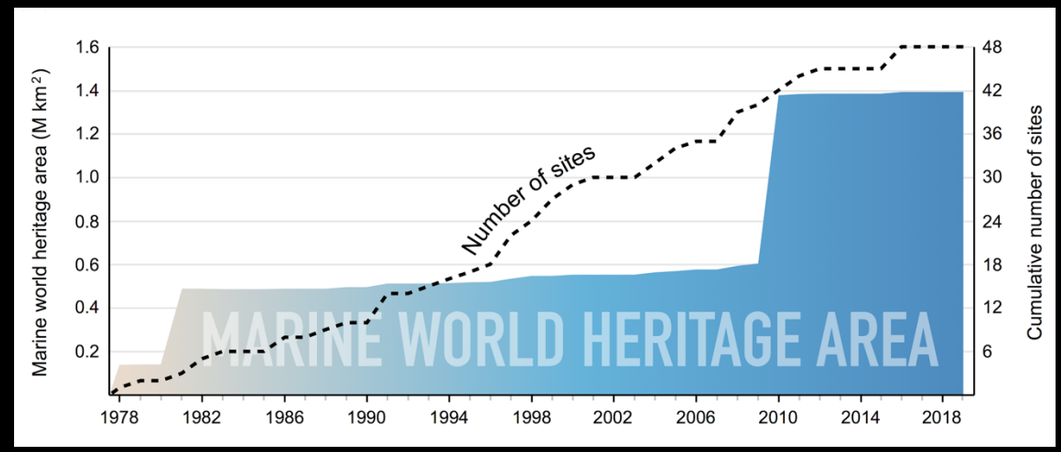
Designing graphs, plots, and charts that are clean, sleek, engaging, and informative can be a challenge. These figures are the most common in research, yet they are often the least attractive to an audience (especially the general public). While most researchers are skilled in generating their own graphs in R, Excel, or Matlab, many are looking for ways to enhance those default outputs. I work with clients to determine which type of graphs will best highlight their results and deliver the clearest message, as well as how to maximize visual appeal to captivate a broader audience.

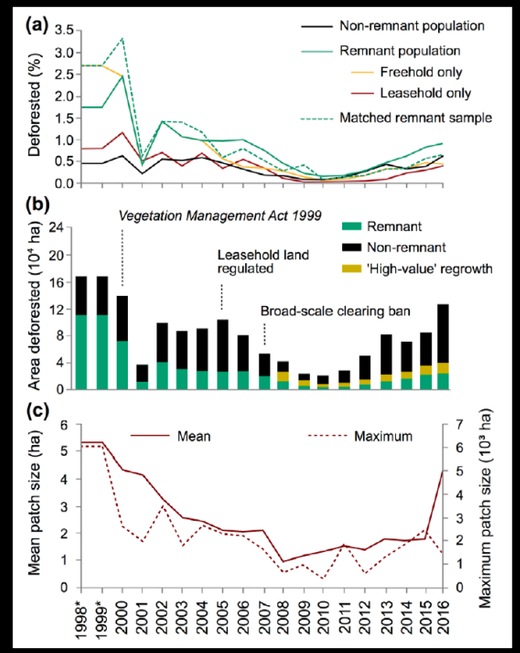


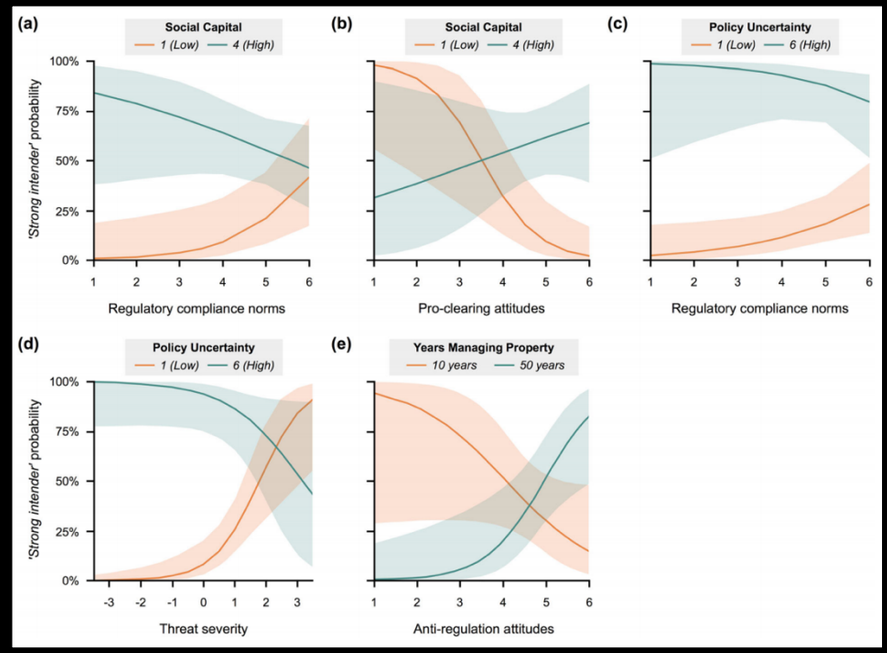


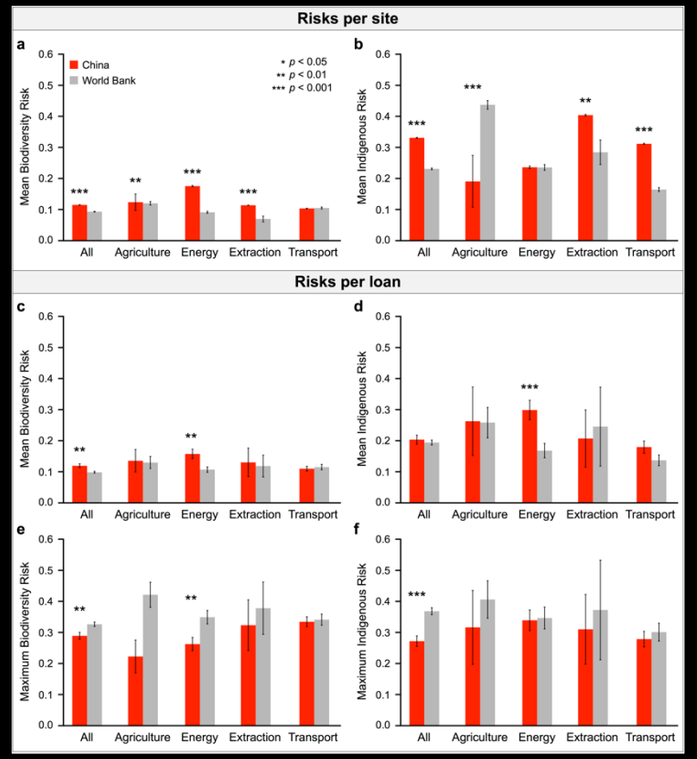

Proportion of land managers (%)
0
20
40
60
80
100
Program Information
Lack of awareness
Environmental benefits
Risks/Threats
Loss of autonomy
Minimise environmental threats
Financial
Financial loss
Financial benefits
Importance
Nature doesn't need protection
Importance or value of nature
Reputation
Others regret participating
Others have benefited
Other Reasons
Availability, Time, Independent
Management benefits
Reasons for not participating
Reasons for participating


China DFI Projects
a
b
Max. Biodiversity Risk
Mean Biodiversity Risk
Max. Indigenous Risk
Mean Indigenous Risk
World Bank DFI Projects
c
d
0.0
0.5
1.0


Marine world heritage area (M km²)
Cumulative number of sites
Number of sites
MARINE WORLD HERITAGE AREA
1978
1982
1986
1990
1994
1998
2002
2006
2010
2014
2018

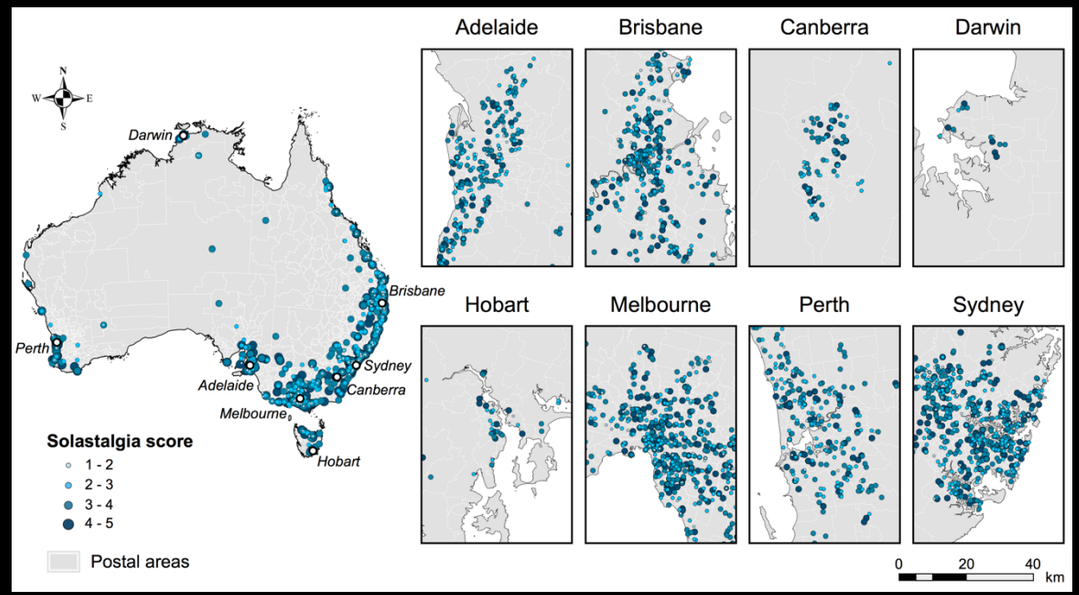

(a)
Deforested (%)
Non-remnant population
Remnant population
Freehold only
Leasehold only
Matched remnant sample
(b)
Vegetation Management Act 1999
Leasehold land regulated
Broad-scale clearing ban
Area deforested (10⁴ ha)
Remnant
Non-remnant
'High-value' regrowth
(c)
Mean patch size (ha)
Maximum patch size (10³ ha)
Mean
Maximum
1998*
1999*
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

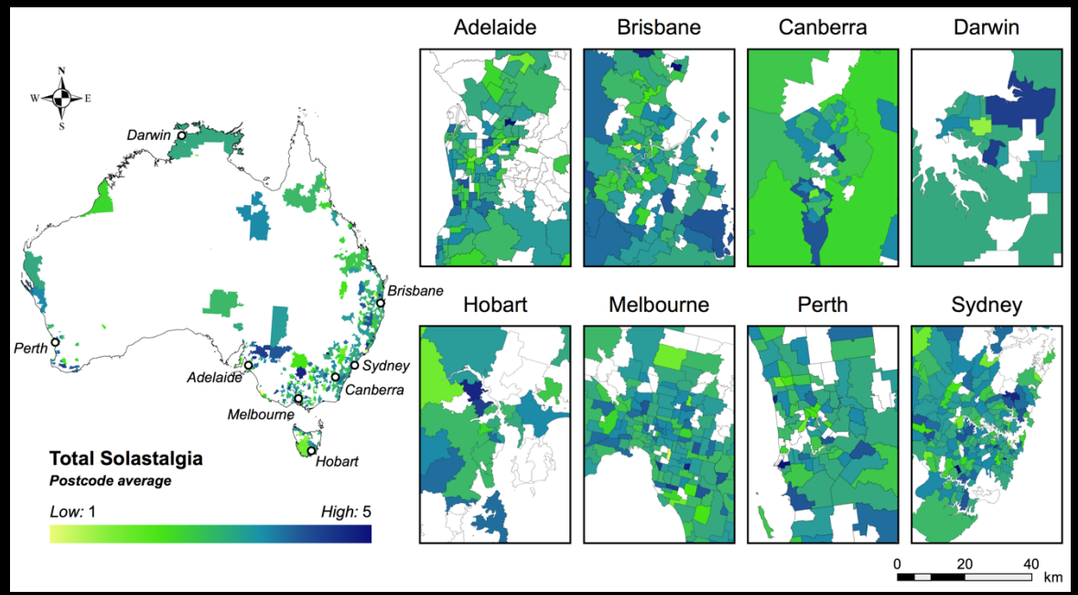

(a)
Social Capital
1 (Low)
4 (High)
'Strong intender' probability
Regulatory compliance norms
(b)
Social Capital
Pro-clearing attitudes
(c)
Policy Uncertainty
1 (Low)
6 (High)
Regulatory compliance norms
(d)
Policy Uncertainty
Threat severity
(e)
Years Managing Property
10 years
50 years
Anti-regulation attitudes

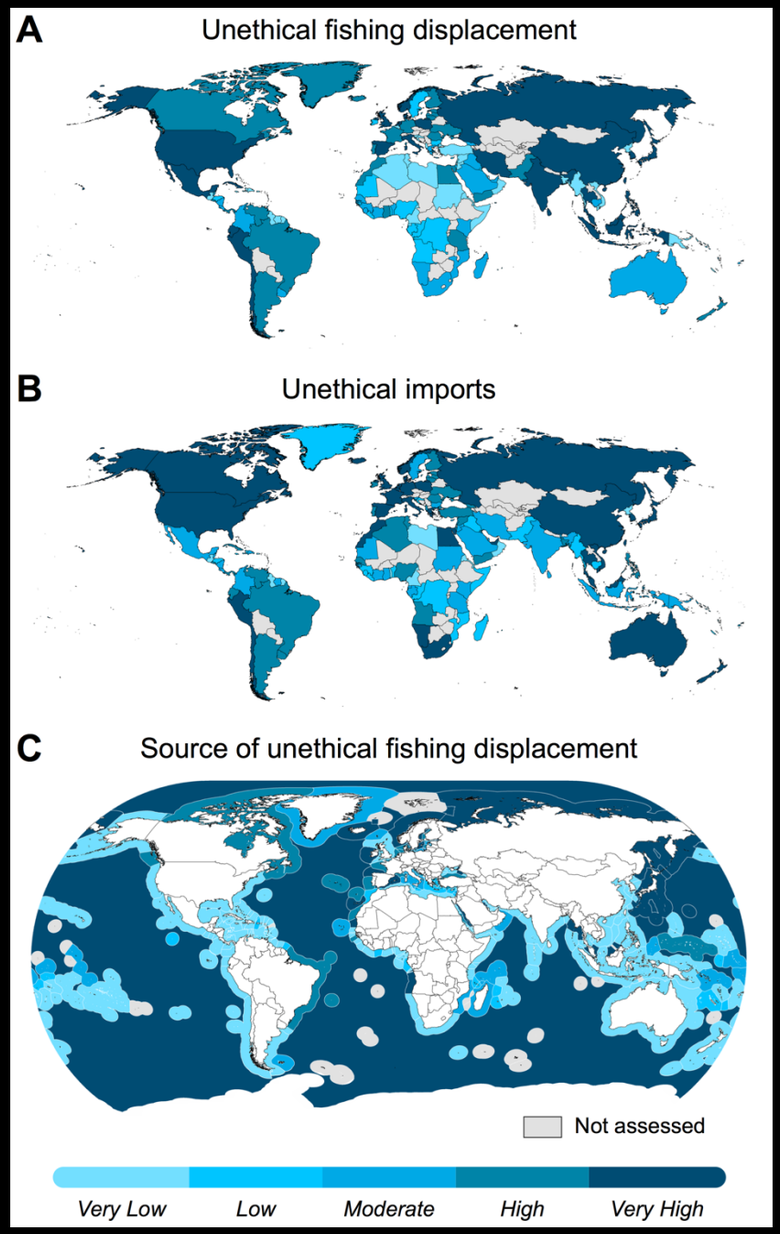

Risks per site
a
b
China
World Bank
* p < 0.05
** p < 0.01
*** p < 0.001
Mean Biodiversity Risk
Mean Indigenous Risk
Risks per loan
c
d
e
f
Maximum Biodiversity Risk
Maximum Indigenous Risk
All
Agriculture
Energy
Extraction
Transport

Maps

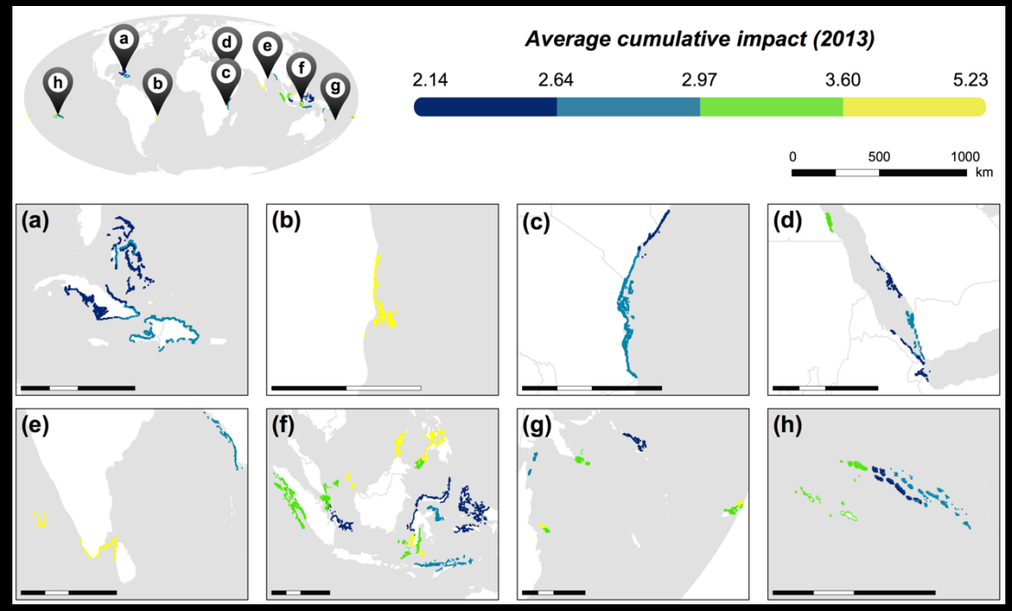
My favorite projects to work on involve mapping spatial data. Luckily for me, this is one of the most common requests I get as a designer, as a smaller proportion of researchers have been trained in geographic information system (GIS) software, like ArcGIS or QGIS, and those who struggle with coding have difficulty using the spatial features of other software, like R or Google Earth Engine. Of course, some skilled mappers still struggle with designing engaging and informative maps. I work with clients of all experience levels to design maps that can best communicate observable spatial patterns and intrigue an audience.

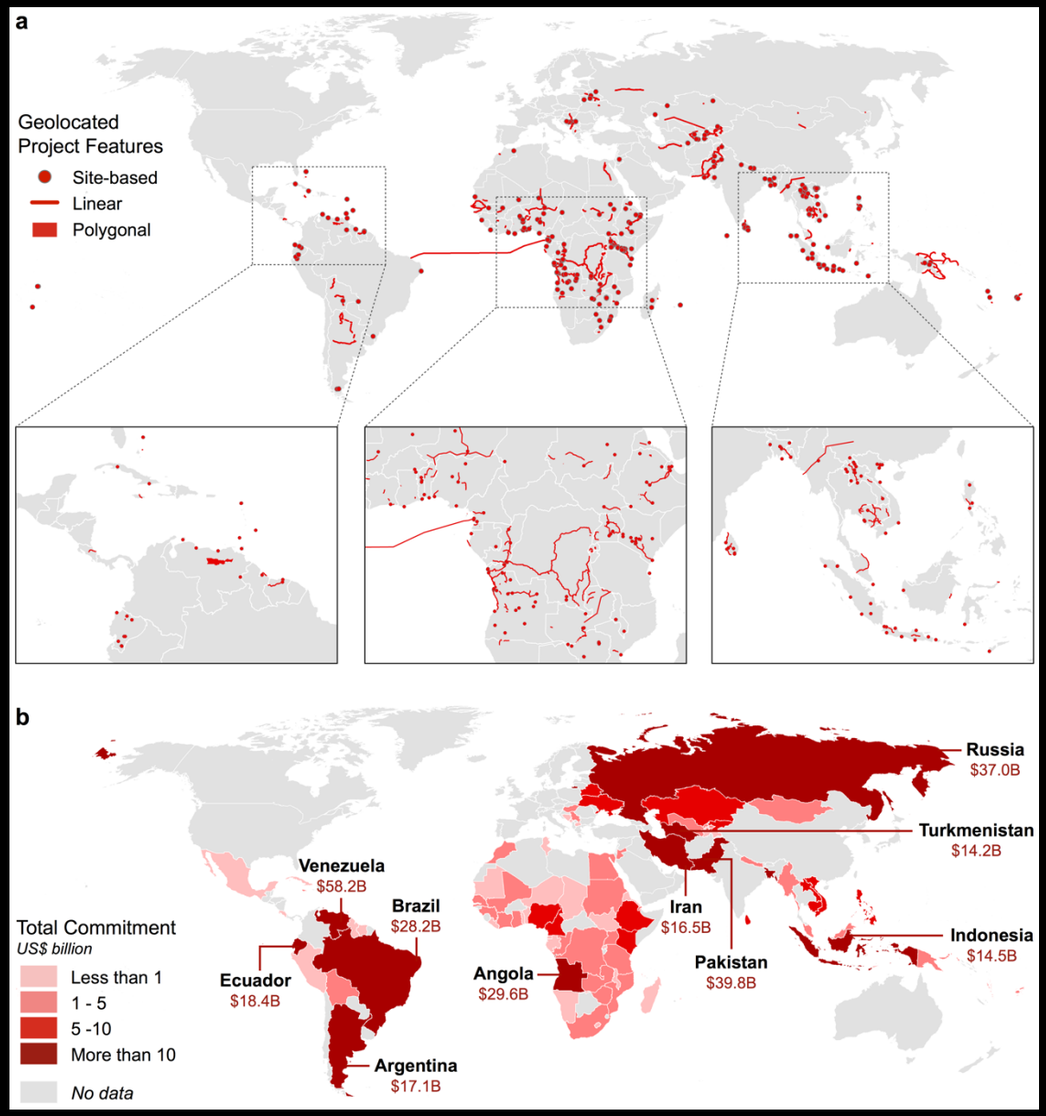


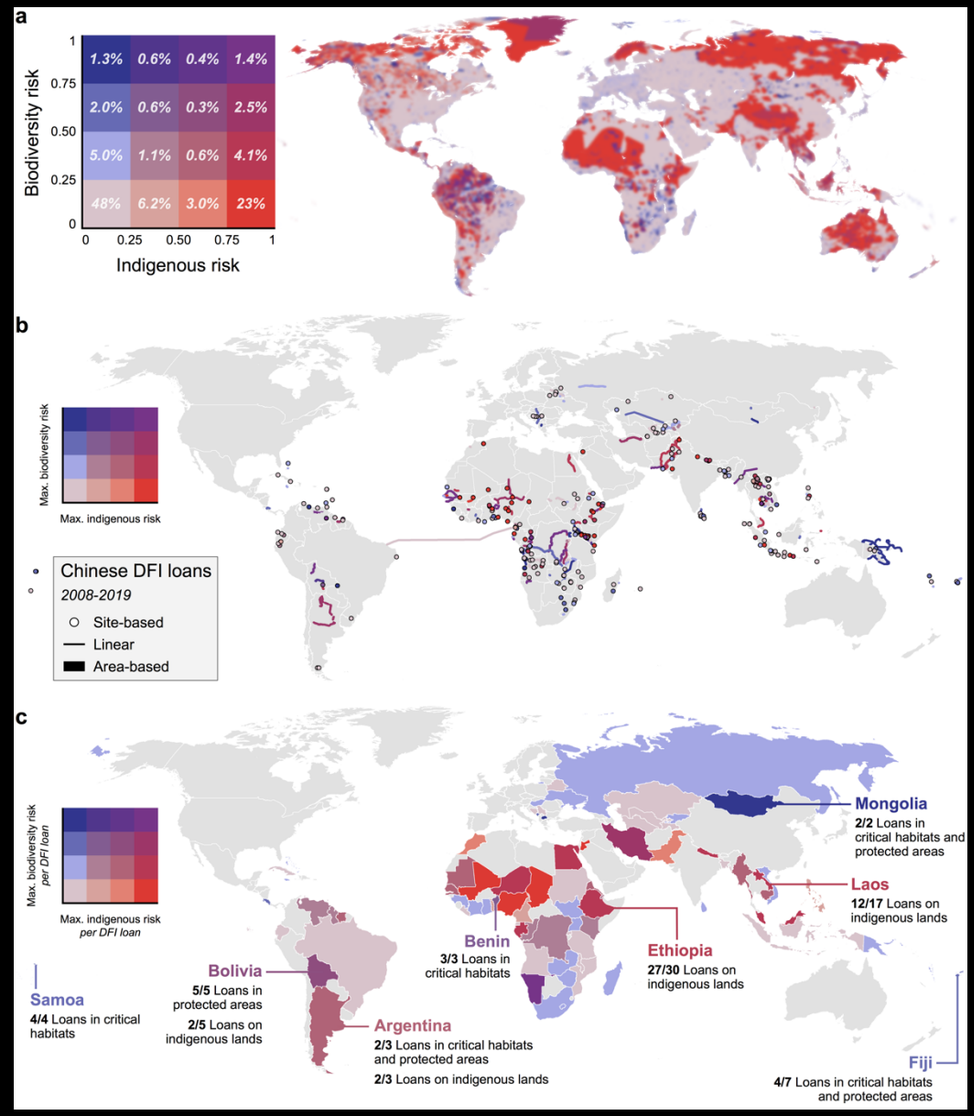



A
Unethical fishing displacement
B
Unethical imports
C
Source of unethical fishing displacement
Not assessed
Very Low
Low
Moderate
High
Very High


CANADA
ST. KITTS & NEVIS
SURINAME
COLOMBIA
BRAZIL
ARGENTINA
MAPUTALAND
ADRIATIC SEA
SEYCHELLES
CORAL TRIANGLE
MONGOLIA
PAPUA NEW GUINEA
GREAT BARRIER REEF
MARXAN
conservation solutions

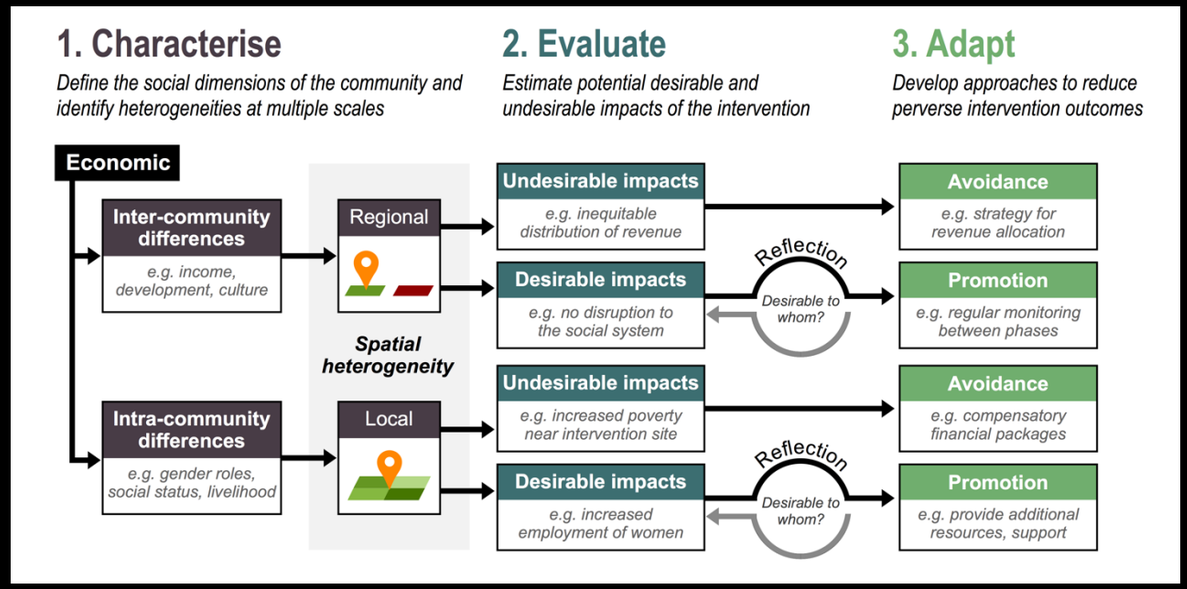

Average cumulative impact (2013)
2.14
2.64
2.97
3.60
5.23
0
500
1000
km
(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)

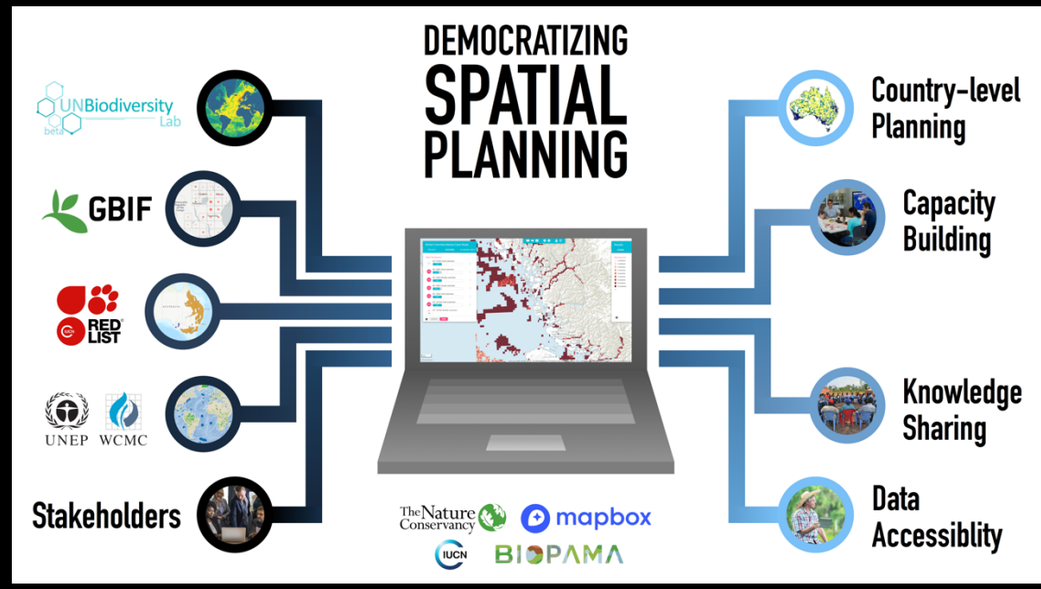

a
Geolocated
Project Features
Site-based
Linear
Polygonal
b
Total Commitment
US$ billion
Less than 1
1 - 5
5 -10
More than 10
No data
Venezuela
$58.2B
Brazil
$28.2B
Ecuador
$18.4B
Argentina
$17.1B
Angola
$29.6B
Iran
$16.5B
Pakistan
$39.8B
Russia
$37.0B
Turkmenistan
$14.2B
Indonesia
$14.5B

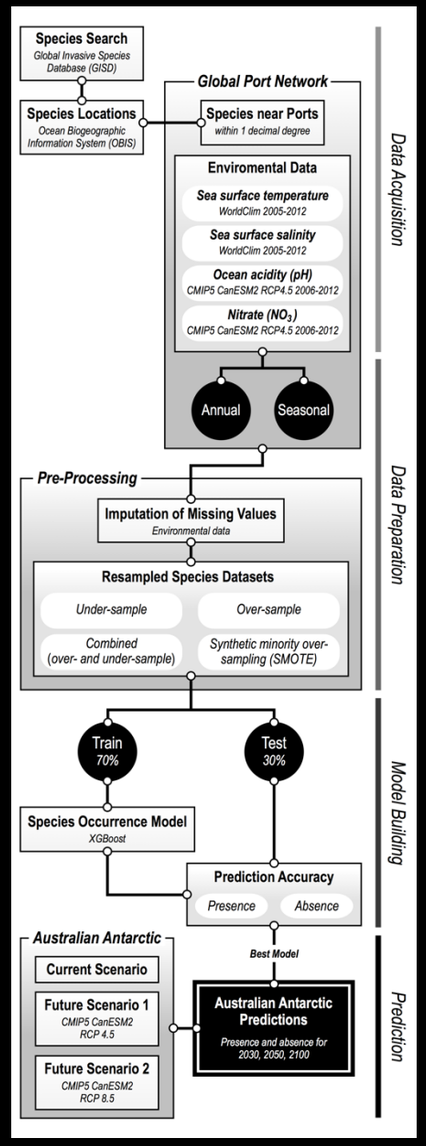

a
Biodiversity risk
Indigenous risk
1.3% 0.6% 0.4% 1.4%
2.0% 0.6% 0.3% 2.5%
5.0% 1.1% 0.6% 4.1%
48% 6.2% 3.0% 23%
b
Max. biodiversity risk
Max. indigenous risk
Chinese DFI loans
2008-2019
Site-based
Linear
Area-based
c
Max. biodiversity risk per DFI loan
Max. indigenous risk per DFI loan
Mongolia
2/2 Loans in critical habitats and protected areas
Laos
12/17 Loans on indigenous lands
Benin
3/3 Loans in critical habitats
Ethiopia
27/30 Loans on indigenous lands
Samoa
4/4 Loans in critical habitats
Bolivia
5/5 Loans in protected areas
2/5 Loans on indigenous lands
Argentina
2/3 Loans in critical habitats and protected areas
2/3 Loans on indigenous lands
Fiji
4/7 Loans in critical habitats and protected areas

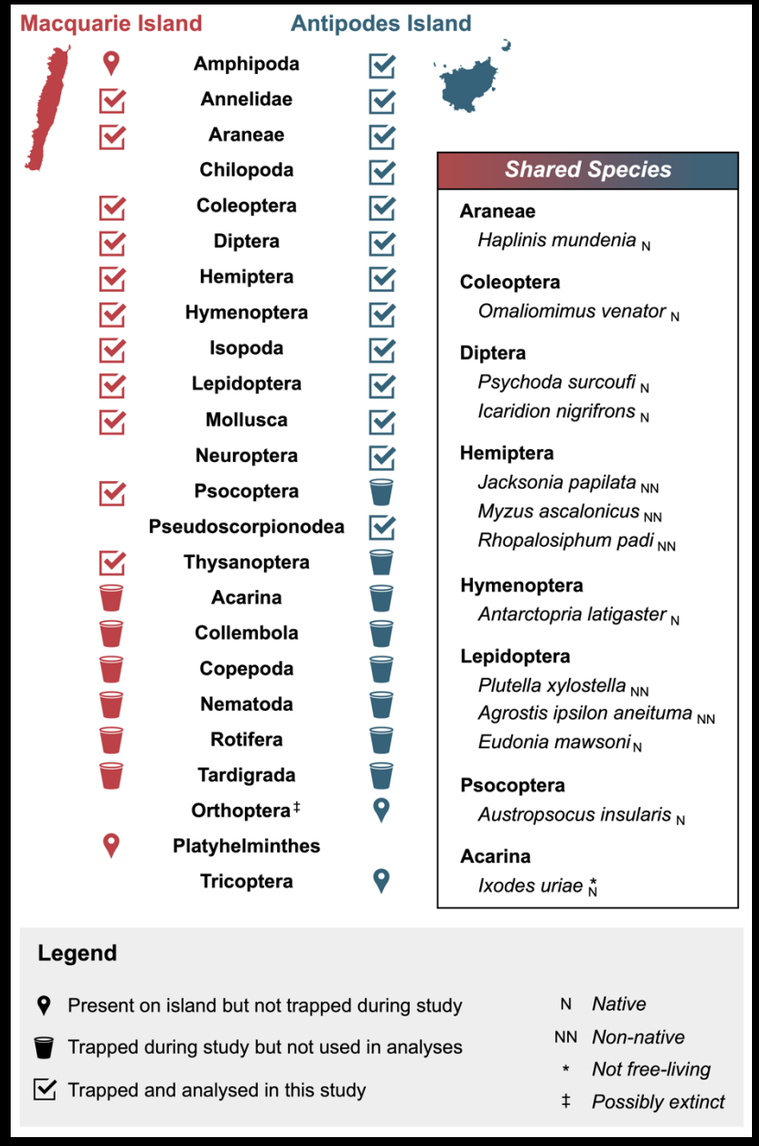
Diagrams

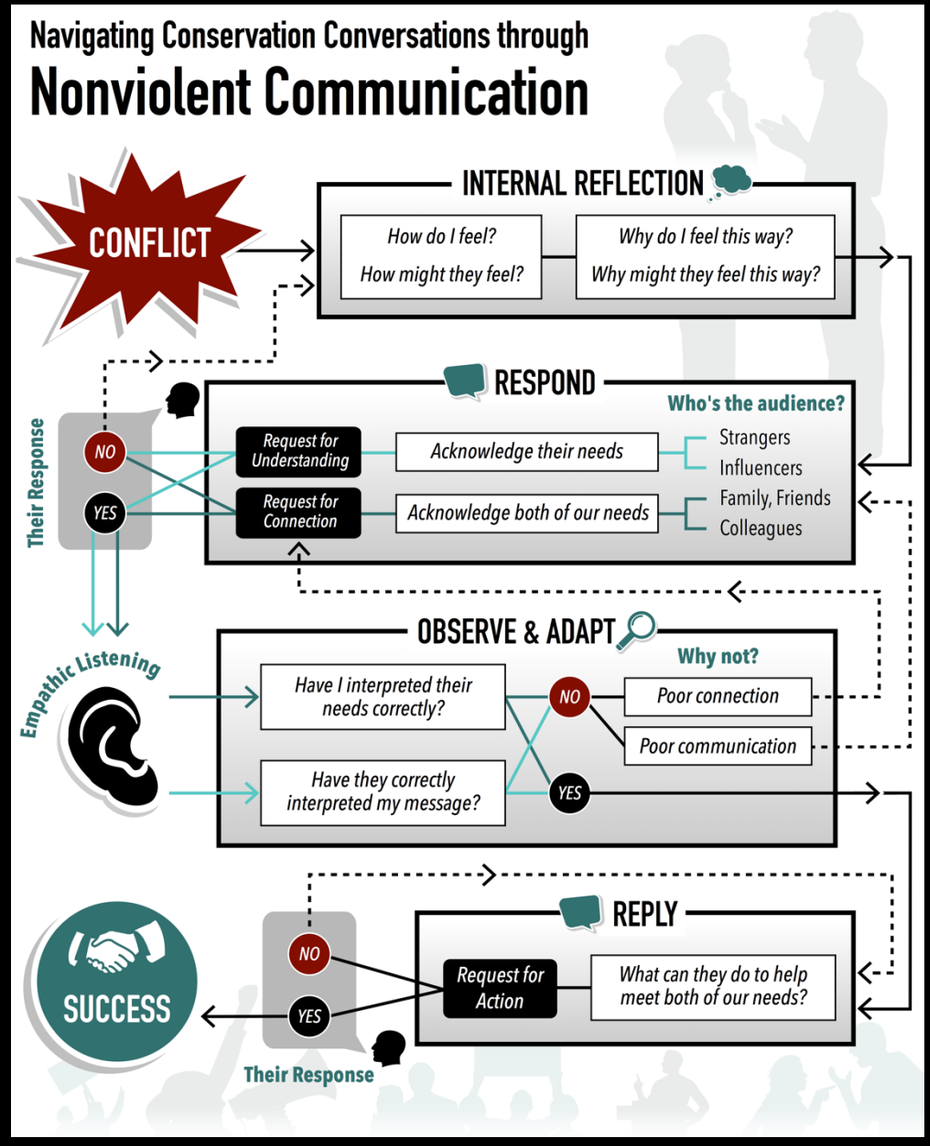
One of the most challenging tasks for researchers (and designers) is explaining an idea, concept, process, or methodology as simply and effectively as possible. One of my most frequent requests is to assist researchers in creating diagrams and flow charts describing a variety of things, like grant proposals, research methods, or event timelines. I work with clients to consolidate complex and intricate concepts or processes into clear, simplified, and attractive diagrams that can efficiently translate paragraphs of text into a single image.

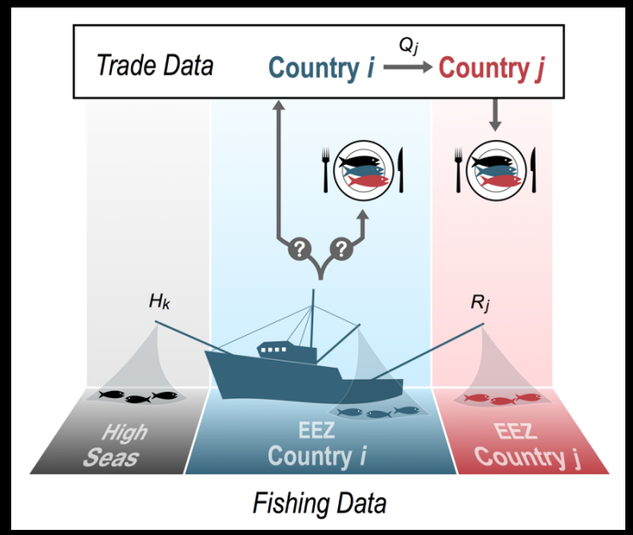


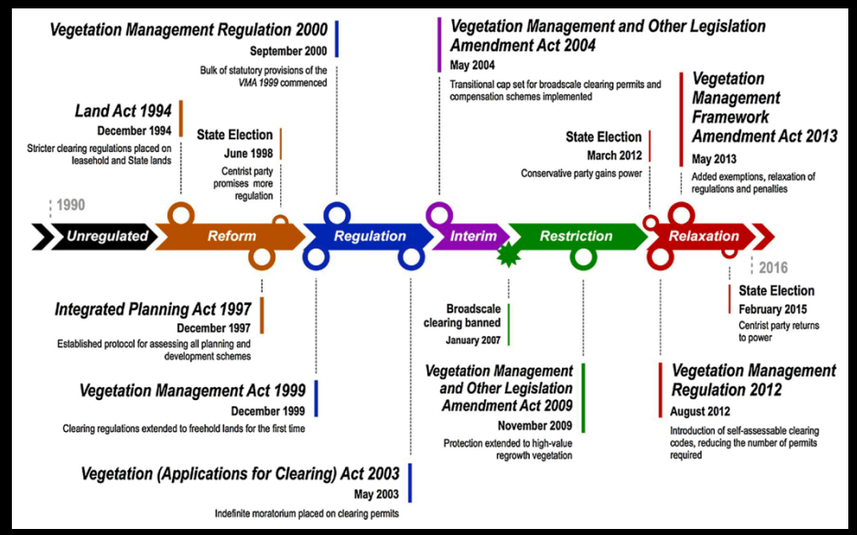


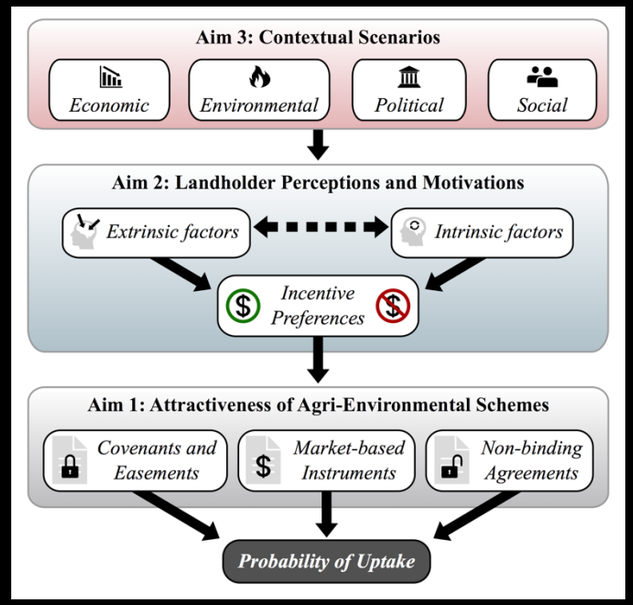

Species Search
Global Invasive Species Database (GISD)
Species Locations
Ocean Biogeographic Information System (OBIS)
Global Port Network
Species near Ports
within 1 decimal degree
Enviromental Data
Sea surface temperature
WorldClim 2005-2012
Sea surface salinity
WorldClim 2005-2012
Ocean acidity (pH)
CMIP5 CanESM2 RCP4.5 2006-2012
Nitrate (NO_3)
CMIP5 CanESM2 RCP4.5 2006-2012
Annual
Seasonal
Data Acquisition
Pre-Processing
Imputation of Missing Values
Environmental data
Resampled Species Datasets
Under-sample
Over-sample
Combined (over- and under-sample)
Synthetic minority over-sampling (SMOTE)
Data Preparation
Train 70%
Test 30%
Species Occurrence Model
XGBoost
Prediction Accuracy
Presence
Absence
Model Building
Australian Antarctic
Current Scenario
Future Scenario 1
CMIP5 CanESM2 RCP 4.5
Future Scenario 2
CMIP5 CanESM2 RCP 8.5
Best Model
Australian Antarctic Predictions
Presence and absence for 2030, 2050, 2100
Prediction

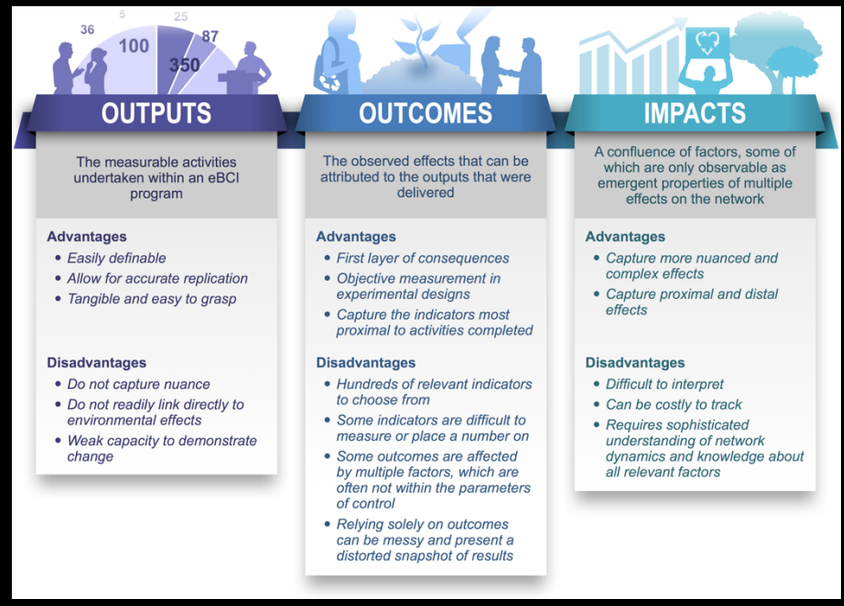

Macquarie Island
Antipodes Island
Amphipoda
Annelidae
Araneae
Chilopoda
Coleoptera
Diptera
Hemiptera
Hymenoptera
Isopoda
Lepidoptera
Mollusca
Neuroptera
Psocoptera
Pseudoscorpionodea
Thysanoptera
Acarina
Collembola
Copepoda
Nematoda
Rotifera
Tardigrada
Orthoptera‡
Platyhelminthes
Tricoptera
Shared Species
Araneae
Haplinis mundenia N
Coleoptera
Omaliomimus venator N
Diptera
Psychoda surcoufi N
Icaridion nigrifrons N
Hemiptera
Jacksonia papilata NN
Myzus ascalonicus NN
Rhopalosiphum padi NN
Hymenoptera
Antarctopria latigaster N
Lepidoptera
Plutella xylostella NN
Agrostis ipsilon aneituma NN
Eudonia mawsoni N
Psocoptera
Austropsocus insularis N
Acarina
Ixodes uriae *N
Legend
Present on island but not trapped during study
Trapped during study but not used in analyses
Trapped and analysed in this study
N Native
NN Non-native
* Not free-living
‡ Possibly extinct

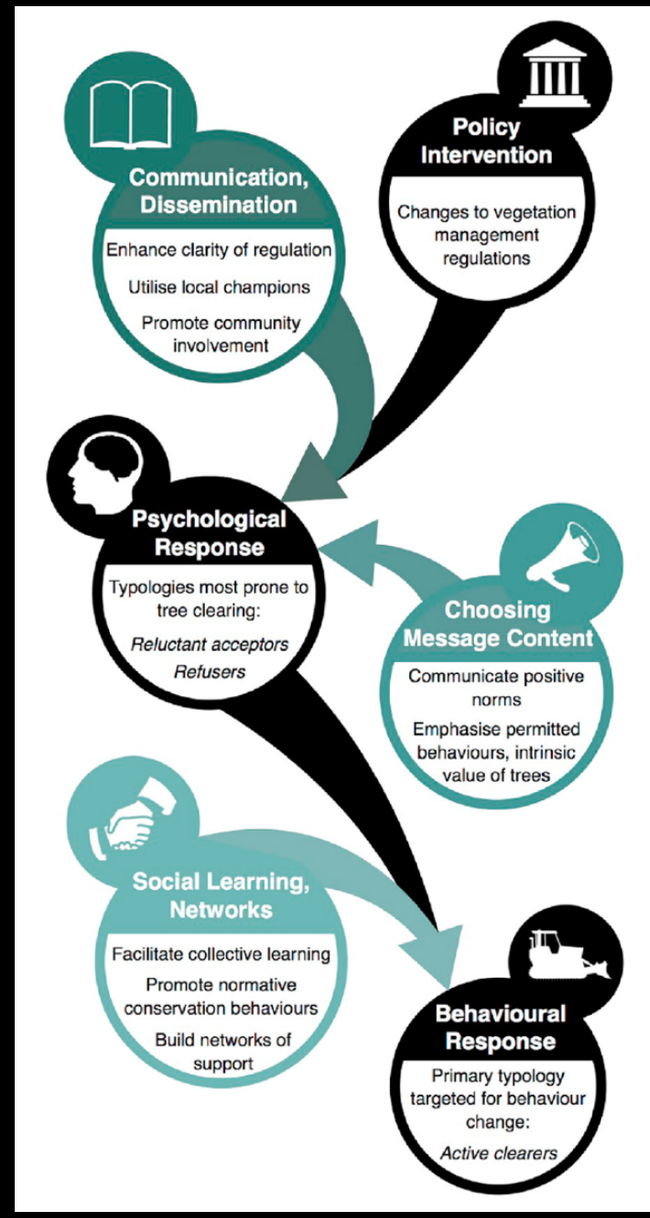

Navigating Conservation Conversations through
Nonviolent Communication
CONFLICT
INTERNAL REFLECTION
How do I feel?
How might they feel?
Why do I feel this way?
Why might they feel this way?
RESPOND
Who's the audience?
Their Response
NO
YES
Request for Understanding
Acknowledge their needs
Strangers
Influencers
Request for Connection
Acknowledge both of our needs
Family, Friends
Colleagues
Empathic Listening
OBSERVE & ADAPT
Why not?
Have I interpreted their needs correctly?
Have they correctly interpreted my message?
Poor connection
Poor communication
REPLY
Request for Action
What can they do to help meet both of our needs?
SUCCESS
Their Response


Trade Data
Country i
Q_j
Country j
H_k
R_j
High Seas
EEZ Country i
EEZ Country j
Fishing Data


Vegetation Management Regulation 2000
September 2000
Bulk of statutory provisions of the VMA 1999 commenced
Land Act 1994
December 1994
Stricter clearing regulations placed on leasehold and State lands
State Election
June 1998
Centrist party promises more regulation
Vegetation Management and Other Legislation Amendment Act 2004
May 2004
Transitional cap set for broadscale clearing permits and compensation schemes implemented
State Election
March 2012
Conservative party gains power
Vegetation Management Framework Amendment Act 2013
May 2013
Added exemptions, relaxation of regulations and penalties
1990
Unregulated
Reform
Regulation
Interim
Restriction
Relaxation
2016
State Election
February 2015
Centrist party returns to power
Integrated Planning Act 1997
December 1997
Established protocol for assessing all planning and development schemes
Broadscale clearing banned
January 2007
Vegetation Management Act 1999
December 1999
Clearing regulations extended to freehold lands for the first time
Vegetation Management and Other Legislation Amendment Act 2009
November 2009
Protection extended to high-value regrowth vegetation
Vegetation Management Regulation 2012
August 2012
Introduction of self-assessable clearing codes, reducing the number of permits required
Vegetation (Applications for Clearing) Act 2003
May 2003
Indefinite moratorium placed on clearing permits

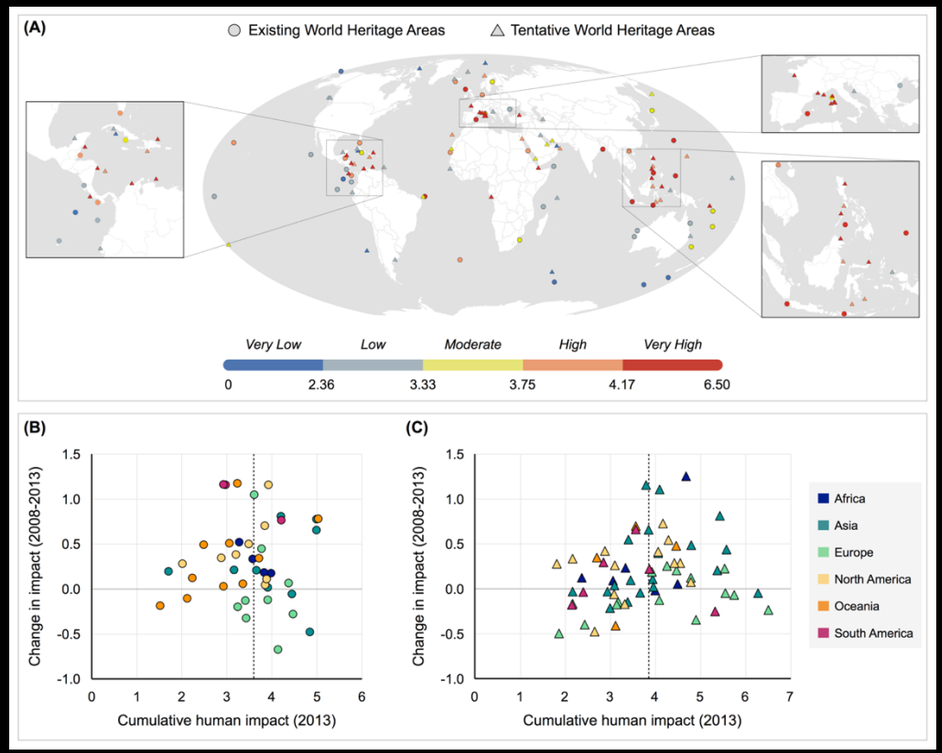

Aim 3: Contextual Scenarios
Economic
Environmental
Political
Social
Aim 2: Landholder Perceptions and Motivations
Extrinsic factors
Intrinsic factors
Incentive Preferences
Aim 1: Attractiveness of Agri-Environmental Schemes
Covenants and Easements
Market-based Instruments
Non-binding Agreements
Probability of Uptake

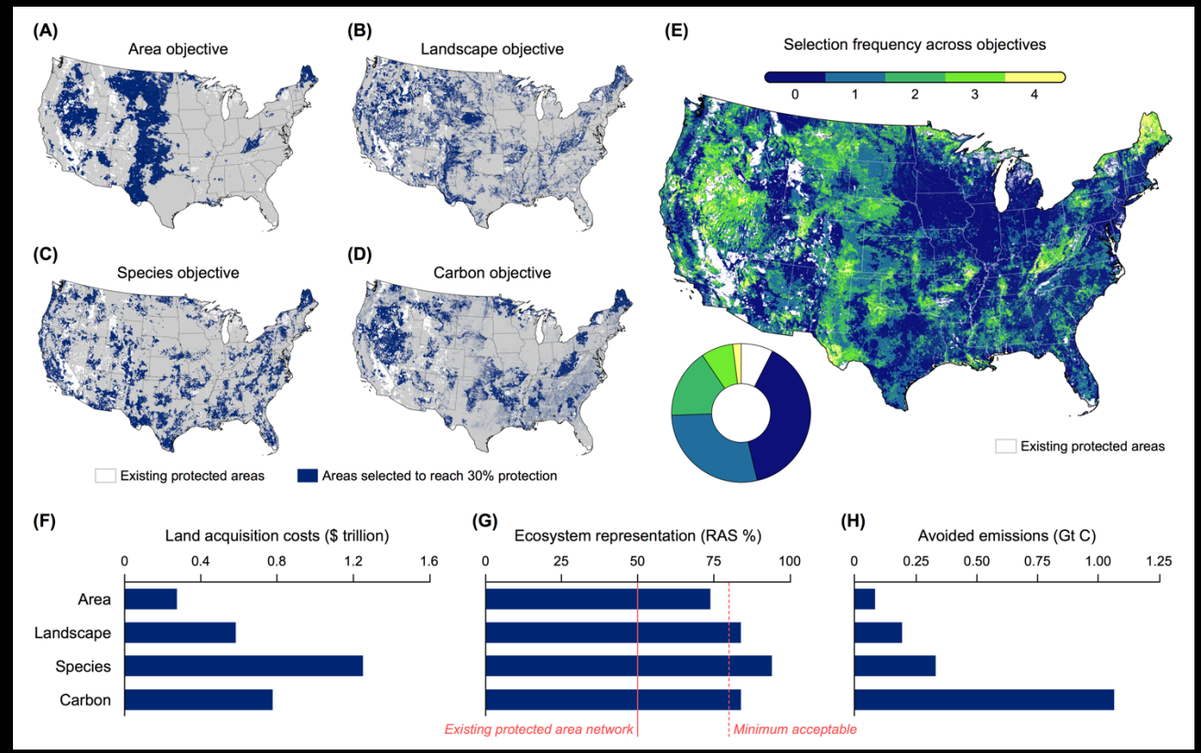

36
5
100
25
87
350
OUTPUTS
The measurable activities undertaken within an eBCI program
Advantages
Easily definable
Allow for accurate replication
Tangible and easy to grasp
Disadvantages
Do not capture nuance
Do not readily link directly to environmental effects
Weak capacity to demonstrate change
OUTCOMES
The observed effects that can be attributed to the outputs that were delivered
Advantages
First layer of consequences
Objective measurement in experimental designs
Capture the indicators most proximal to activities completed
Disadvantages
Hundreds of relevant indicators to choose from
Some indicators are difficult to measure or place a number on
Some outcomes are affected by multiple factors, which are often not within the parameters of control
Relying solely on outcomes can be messy and present a distorted snapshot of results
IMPACTS
A confluence of factors, some of which are only observable as emergent properties of multiple effects on the network
Advantages
Capture more nuanced and complex effects
Capture proximal and distal effects
Disadvantages
Difficult to interpret
Can be costly to track
Requires sophisticated understanding of network dynamics and knowledge about all relevant factors


Communication, Dissemination
Enhance clarity of regulation
Utilise local champions
Promote community involvement
Policy Intervention
Changes to vegetation management regulations
Psychological Response
Typologies most prone to tree clearing:
Reluctant acceptors
Refusers
Choosing Message Content
Communicate positive norms
Emphasise permitted behaviours, intrinsic value of trees
Social Learning, Networks
Facilitate collective learning
Promote normative conservation behaviours
Build networks of support
Behavioural Response
Primary typology targeted for behaviour change:
Active clearers

Hybrids

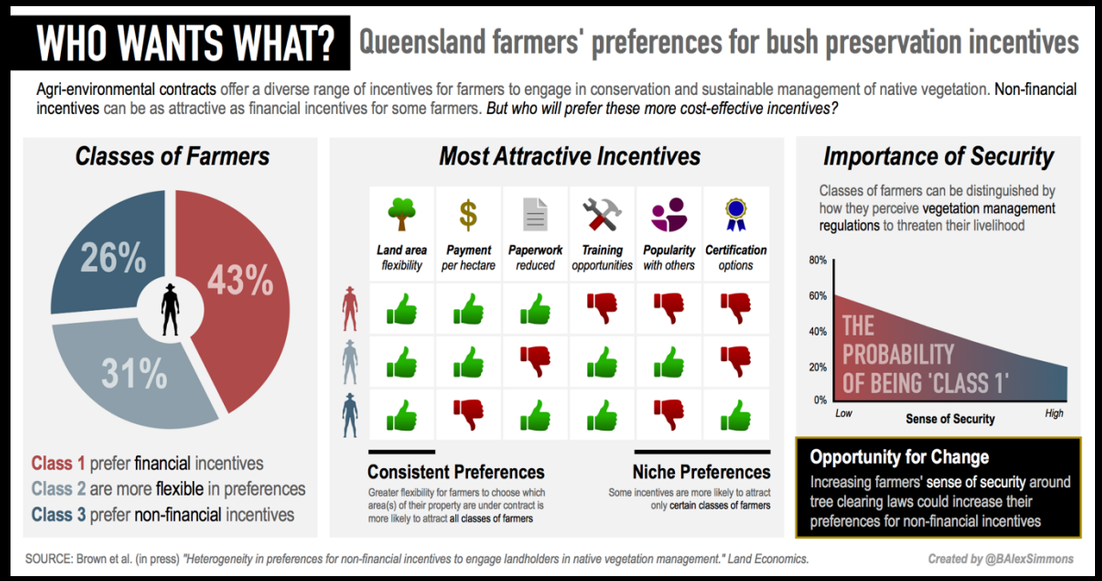
Often, merging graphs and maps into a single figure will be advantageous for researchers – whether it's to enhance the clarity of a complex message or because of limitations in the number of figures that a journal accepts. These hybrid designs are often more impactful because they present a more complete story, provide a diversity of content for the reader to explore, and are easier to share than multiple figures.

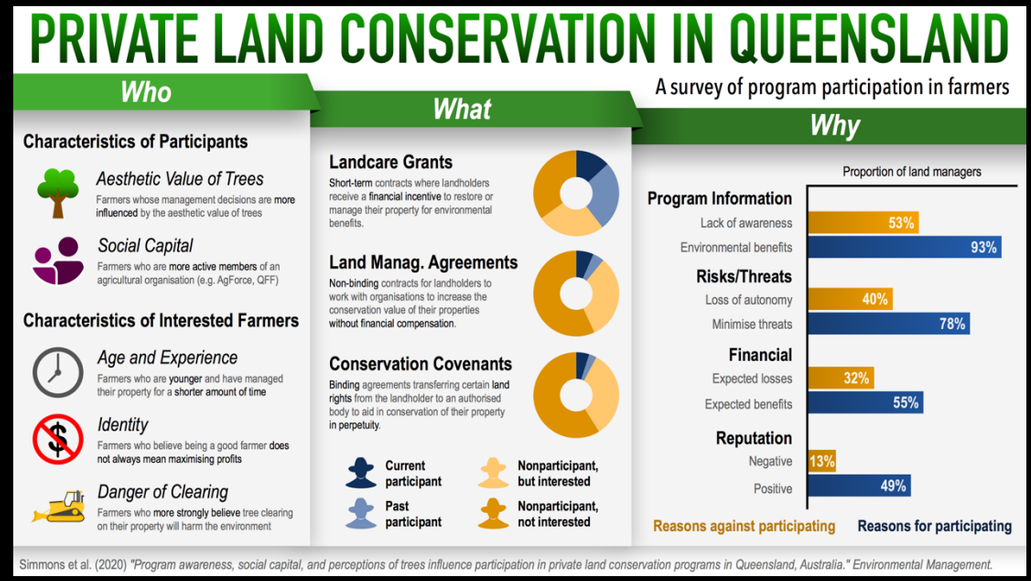




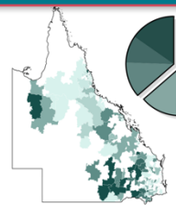
Infographics

Probably the most satisfying projects for me are those involving infographics. Infographics are the 'mixed media art' of the graphic design world, sometimes incorporating text, graphs, maps, tables, and diagrams all in one image that summarizes the key messages of a project. Because of their ability to concisely summarize results or entire projects, and their design tailored to engage and inform a lay audience, infographics tend to have the greatest impact on social media platforms (second to short animations). Thus, they provide an excellent opportunity for my clients to communicate their research to a broad audience and gain greater exposure for them and their work.





MAPPING INTENTIONS



Most farmers have **weak clearing intentions**

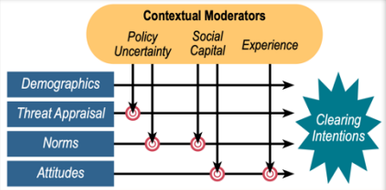
But intentions remain **strong in historical clearing hostpots**

Likelihood of clearing trees in the next six months

Very Low — *Very High*

@BAlexSimmons

AN INTEGRATED MODEL



PSYCHOSOCIAL DRIVERS OF DEFORESTATION INTENTIONS

Behavioural frameworks remain underutilised in describing what drives private landholders' deforestation intentions under political, social, and management contexts.

Using survey data of farmers across the state of Queensland, Australia, we compared the ability of the Theory of Planned Behaviour and Protection Motivation Theory to predict farmers' future tree clearing intentions.

We propose an integrated behavioural model of deforestation intentions that gives a more accurate account of the psychosocial factors - and important contextual moderators - driving deforestation intentions in highly regulated and contentious deforestation contexts.

IMPORTANCE OF CONTEXT

Threat of Regulations

Farmers whose decisions are affected by **impending regulations** have stronger clearing intentions, even if they believe regulations are a relatively **low threat** to them

Compliance Norms

Farmers whose decisions are affected by **impending regulations** have stronger clearing intentions, regardless of perceived regulatory **compliance norms** in their community

Farmers that are more **activley involved** in their community have the strongest clearing intentions when they believe others are **not complying** with clearing regulations

Pre-emptive decision making amidst uncertainty

Clearing Attitudes

Farmers with strong **pro-clearing** attitudes tend to have **weak** clearing intentions, but those intentions **strengthen** when they are **more involved** in their community

Signs of potential **social verification**

Regulation Attitudes

Farmers with strong **anti-regulation** attitudes tend to have **weak** clearing intentions, but intentions **strengthen** in farmers with **more experience** managing their property

Influence changes with **experience**

BEHAVIOUR CHANGE OPPORTUNITIES

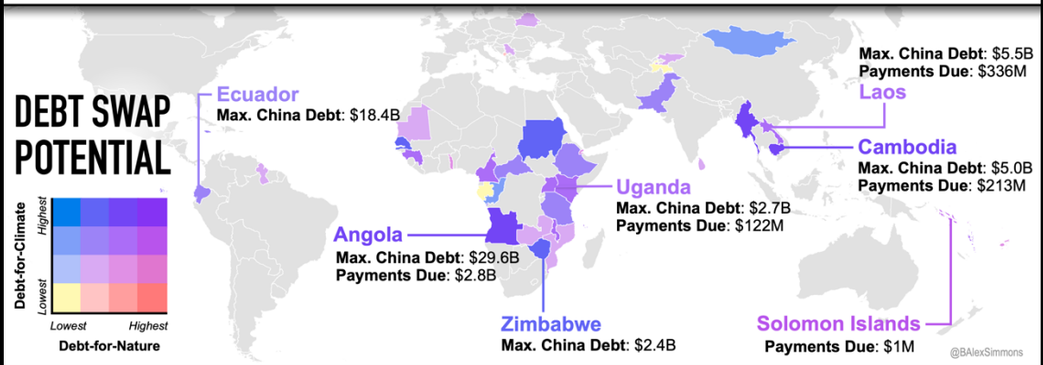
Promote conservation and compliance norms in clearing hotspots to increase social verification. Explore potential for community-based social marketing and similar campaigns. Investigate links between clearing intentions and realised clearing behaviour.

READ MORE: *BA Simmons, KA Wilson, AJ Dean (2021) "Psychosocial drivers of land management behaviour: how threats, norms, and context influence deforestation intentions." Ambio.*

CHINA CAN HELP SOLVE THE DEBT AND ENVIRONMENTAL CRISES

As developing countries emerge from the **COVID-19 crisis**, they will need to pivot rapidly to relaunch their economies. Standing in the way is the looming **debt crisis**. Without substantial debt relief, countries will face pressure to exploit natural capital to pay short-term debt, placing **conservation** and **climate change** ambitions aside. We explore opportunities for **China** - the world's largest bilateral creditor - to alleviate debt burdens in exchange for debtor nation commitments to climate mitigation and environmental protection through **debt-for-climate** and **debt-for-nature swaps**.

DEBT SWAP POTENTIAL



Learn more... **ARTICLE** B. A. Simmons et al. (2021) China can help solve the debt and environmental crises. *Science* 371: 468-470.

WEBINAR Wednesday, Feb. 3, 2021, 9:30-10:30 AM EST gdpcenter.org/3iMGFk3

INTACTNESS

CLIMATE CHANGE

Intact forests currently absorb around 25% of carbon emissions from all human sources -- damaging them will leave far more carbon dioxide in the air to warm the climate.

INDIGENOUS CULTURE

Intact forests enable many indigenous groups to sustain their traditional cultures and livelihoods. In turn, these peoples are often staunch defenders of their ancestral lands.

BIODIVERSITY

Intact forests have higher numbers of forest dependent species and have higher functional and genetic diversity.

WATER AVAILABILITY

Intact tropical forests ensure the stability of local and regional weather, generating more rain than cleared forests and thereby reducing the risk of drought.

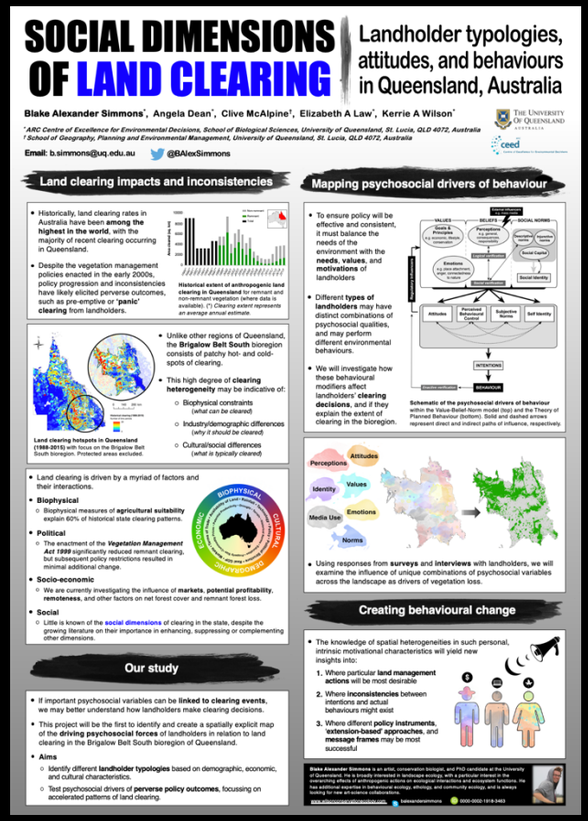
HUMAN HEALTH

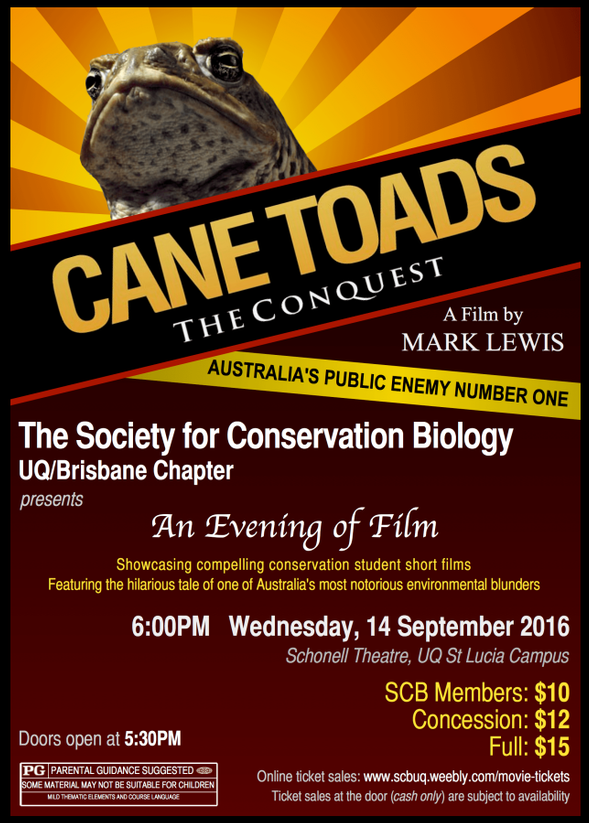
Forest degradation and loss compromise the supply of medically-beneficial species that millions of people rely on; additionally, forest degradation drives the spread of many infectious diseases by bringing humans and disease vectors into close contact.

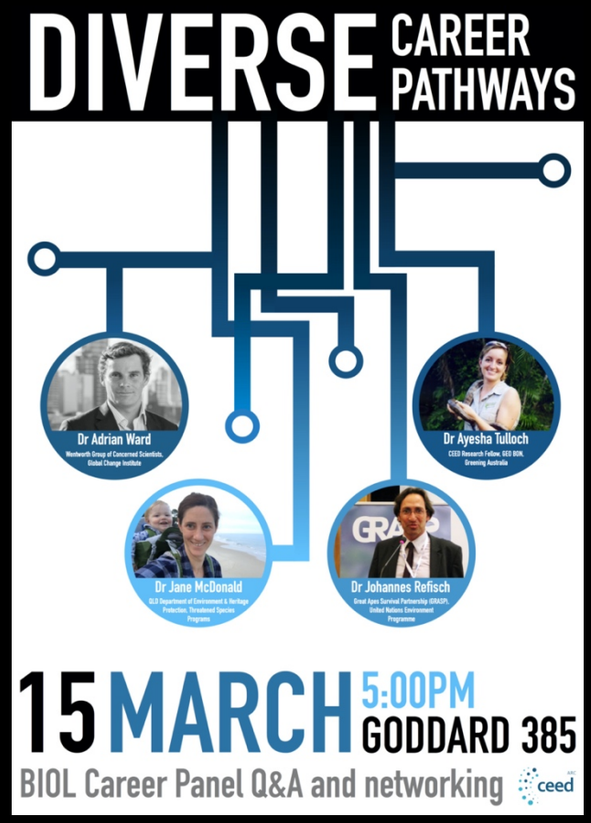
Learn more at: www.greenfirescience.com

Advertisements

What kind of graphic designer would I be if I didn't also cover advertisement materials? Whether you need a poster or flyer for an upcoming conference, seminar, or other event, I can help you get the word out and attract those with even the shortest attention span.

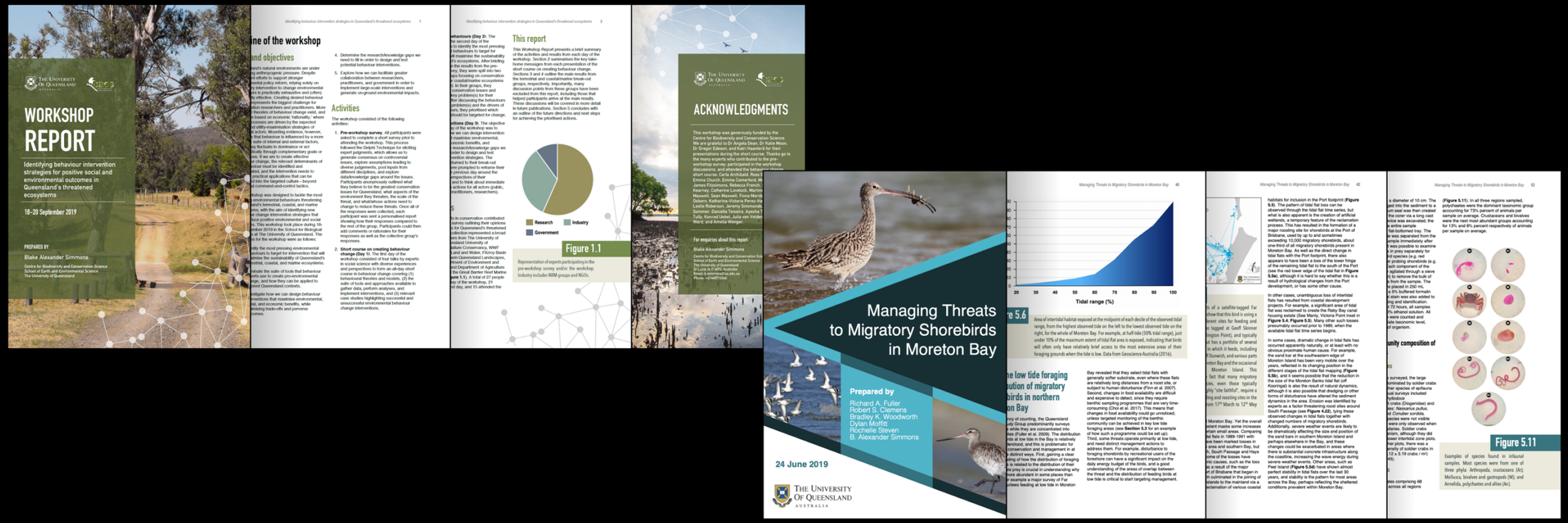






Reports

Not every important output is a peer-reviewed article. Reports, white papers, policy briefs, and working papers are often important for researchers and practitioners looking to quickly communicate outcomes or progress to funders, policy makers, and other stakeholders. If you've got the text, I can help turn your drab report into a fab report to impress even the most cynical reader and give your work the beautiful packaging it deserves.



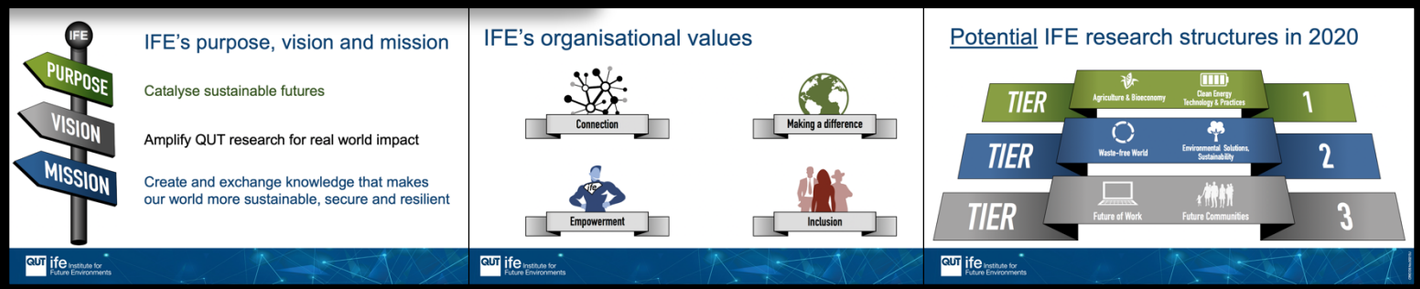
Logos, Icons & More

Design opportunities are endless, and no project is too small to be rewarding! Whether you need a logo for your business or conference, cover art for your new podcast, clever icons for an important presentation, an animated graphic to share on Twitter, or…whatever you may need fashion illustrations for (*please give me reasons to spend more time on fashion designs*)…I can work with you to achieve your vision!

LOGOS

FASHION DESIGN

PRESENTATIONS



COVER ART

CONTACT

This booklet contains just a sample of the designs I've created with researchers around the world in the last decade. Contact me for more information about my services (including animated graphics not viewable in this booklet), discuss your design needs, or just to learn more about artistic endeavours in science.

For many small projects, I do not charge a fee – I just love getting more opportunity to be creative! For more intensive or complex projects, I offer flexible payment options and will work with your budget. I also regularly run an hour-long professional development seminar for scientists on data visualization called, "Beautifying Your Research: tips and tricks for creating high-impact figures." Please reach out if you would like to participate in an upcoming seminar or schedule one for you and your colleagues, lab group, or department.

b.alexander.simmons @ gmail.com