natural capital PROJECT

VISUALIZING AND COMMUNICATING RESULTS

March 28, 2014

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AGENDA
VISUALIZING AND COMMUNICATING RESULTS

- Communication
- Design
- Presenting results & dealing with uncertainty
- Tips for creating outputs
- Critique
- Q&A

Communication 101

natural capital PROJECT

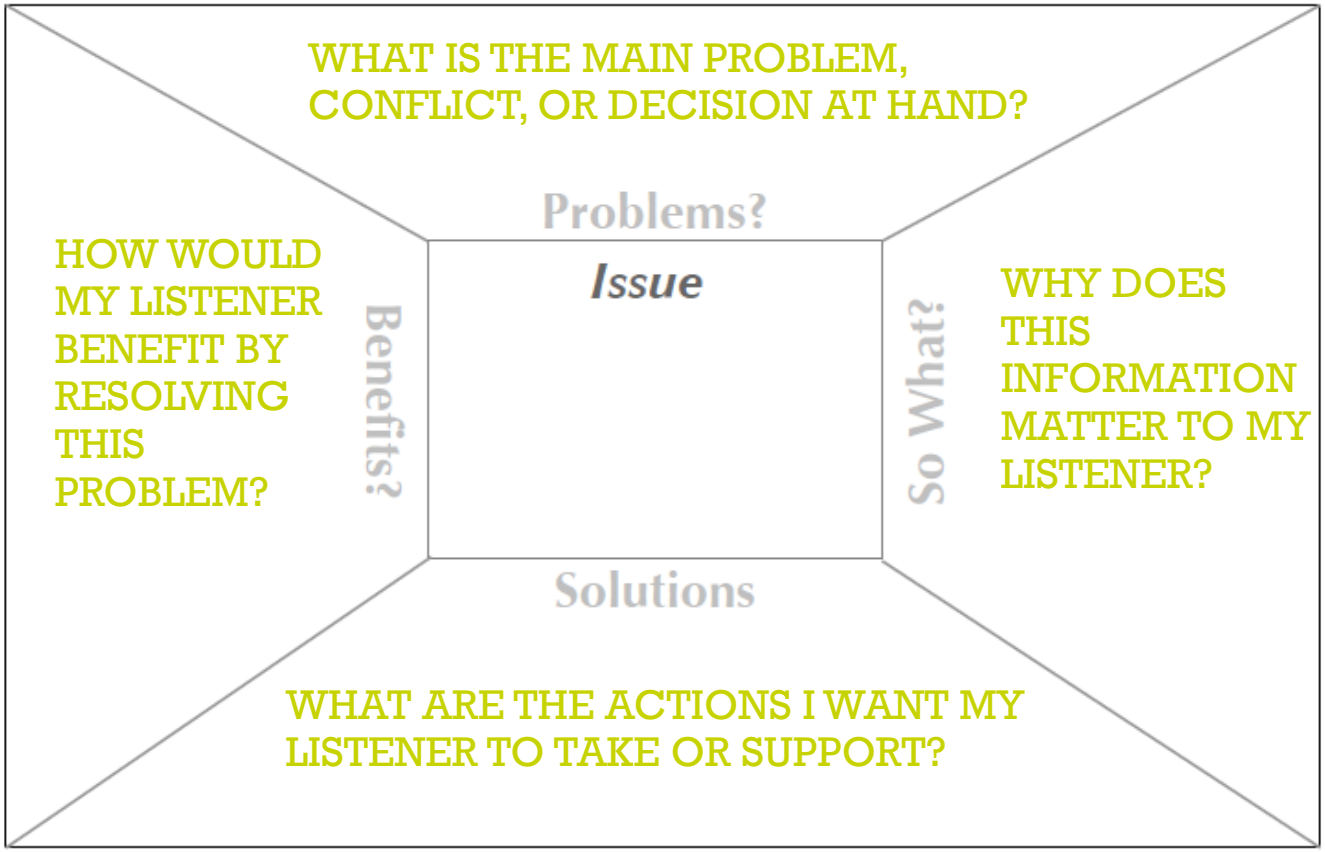
UNDERSTAND YOUR AUDIENCE

Who are they? What do they care about?


FRAME
THE ISSUE
Clarify & Simplify

The Message Box

Audience: _____



TELL A STORY

Once upon a time...

natural capital PROJECT

Design 101

CRAP!

- Contrast
- Repetition
- Alignment
- Proximity

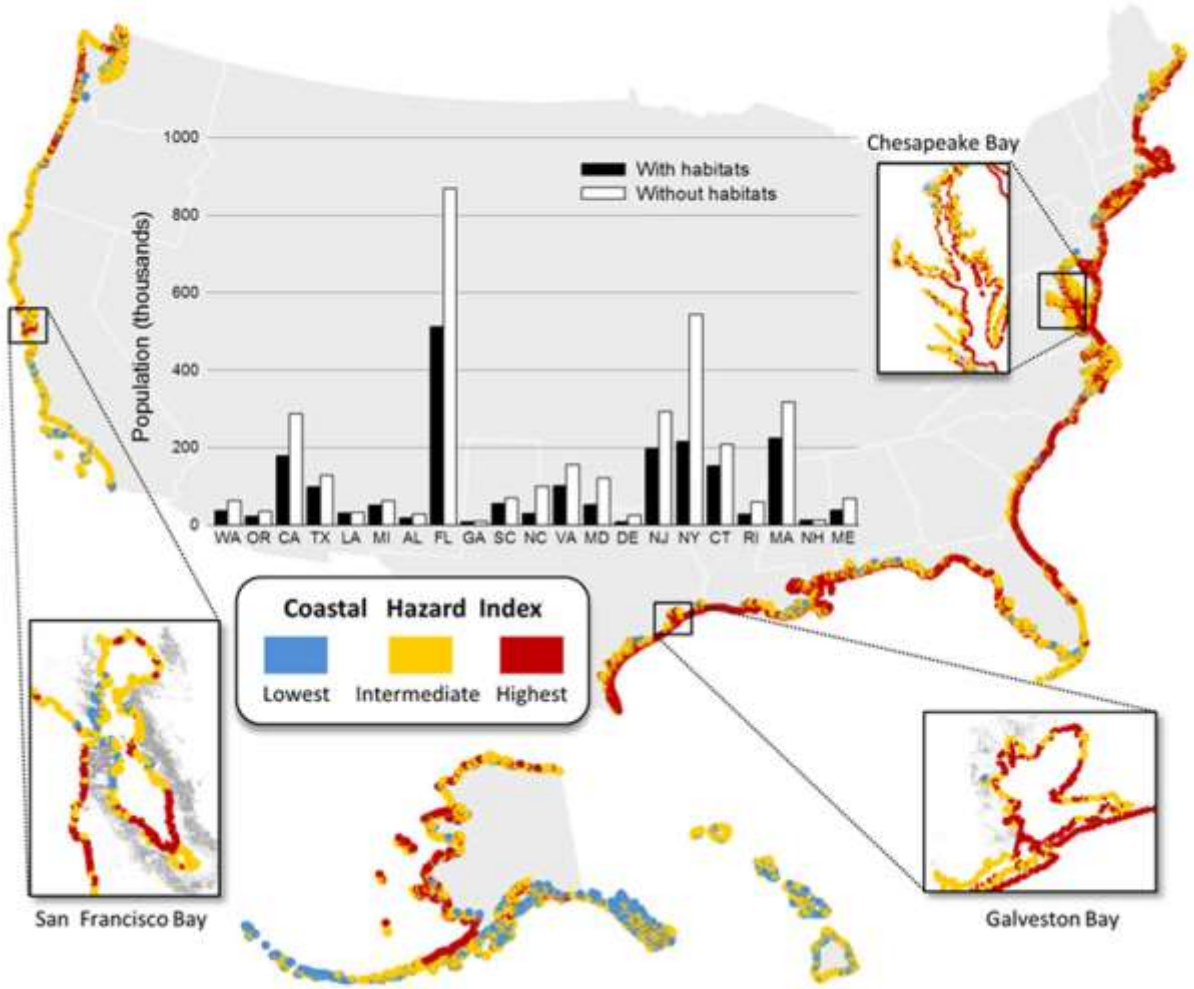
KEEP IT SIMPLE

Give them the information they need

Only the information they need

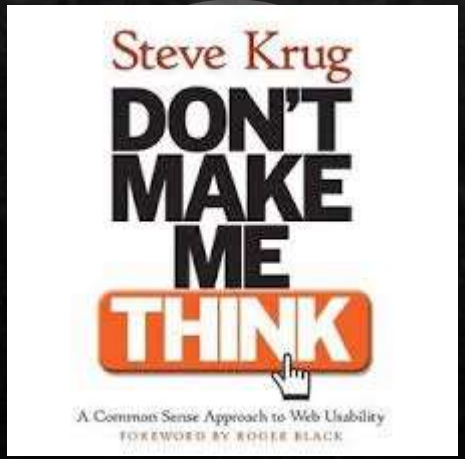
In a way they can understand

& use it


Population (thousands)
1000
800
600
400
200
0
With habitats
Without habitats
WA OR CA TX LA MI AL FL GA SC NC VA MD DE NJ NY CT RI MA NH ME
Chesapeake Bay
Coastal Hazard Index
Lowest
Intermediate
Highest
San Francisco Bay
Galveston Bay

MAKE IT INTUITIVE

Don't make them think



EXTRA PAGES

Resources for design

BOOKS

- Don't make me think
  - http://www.amazon.com/Dont-Make-Think-Revisited-Usability/dp/0321965515/ref=sr_1_1?ie=UTF8&qid=1395957761&sr=8-1&keywords=book+don%27t+make+me+think
- Escape from the Ivory Tower: A Guide to Making Your Science Matter
  - http://www.amazon.com/Escape-Ivory-Tower-Making-Science/dp/1597266647/ref=sr_1_1?s=books&ie=UTF8&qid=1395957835&sr=1-1&keywords=ivory+tower
- Edward Tufte
  - http://www.edwardtufte.com/tufte/

DESIGN RESOURCES

- Stephen Few's page has some great before and after examples showing how bad design can be quickly and easily improved.
  - http://www.perceptualedge.com/examples.php
- The Functional Art by Alberto Cairo
  - http://www.amazon.com/The-Functional-Art-visualization-ebook/dp/B0091SXDOM/ref=pd_ybh_2
- Another great design book (focused more on text than figures, but including brochures and other highly visual products) to get started: The Non-Designer's Design Book (by Robin Williams)
  - http://www.amazon.com/Non-Designers-Design-Book-Designers-ebook/dp/B00125MJYM/ref=sr_1_1
- An understanding of some basic principles of visual perception (the Gestalt Principles) can be used to create compelling logos, figures, and design.
  - This link shows which of the various perceptual elements are dominant (e.g. proximity determines relatedness more than color): http://www.vanseodesign.com/web-design/gestalt-principles-of-perception/
  - This link has examples of logos and web design that incorporate some of the Gestalt Principles: http://www.instantshift.com/2011/09/19/the-close-relationship-between-gestalt-principles-and-design/
- The New York Times has excellent examples of infographics that are eye-catching and compelling. They tend to encourage exploration more than quickly convey concepts.
  - http://www.nytimes.com/interactive/2012/12/30/multimedia/2012-the-year-in-graphics.html

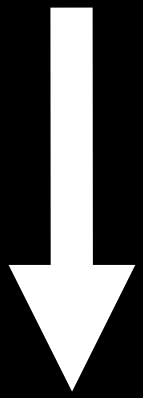
Tech Tips!

WYSIWYG

WYSINWYG

WYSIWYG

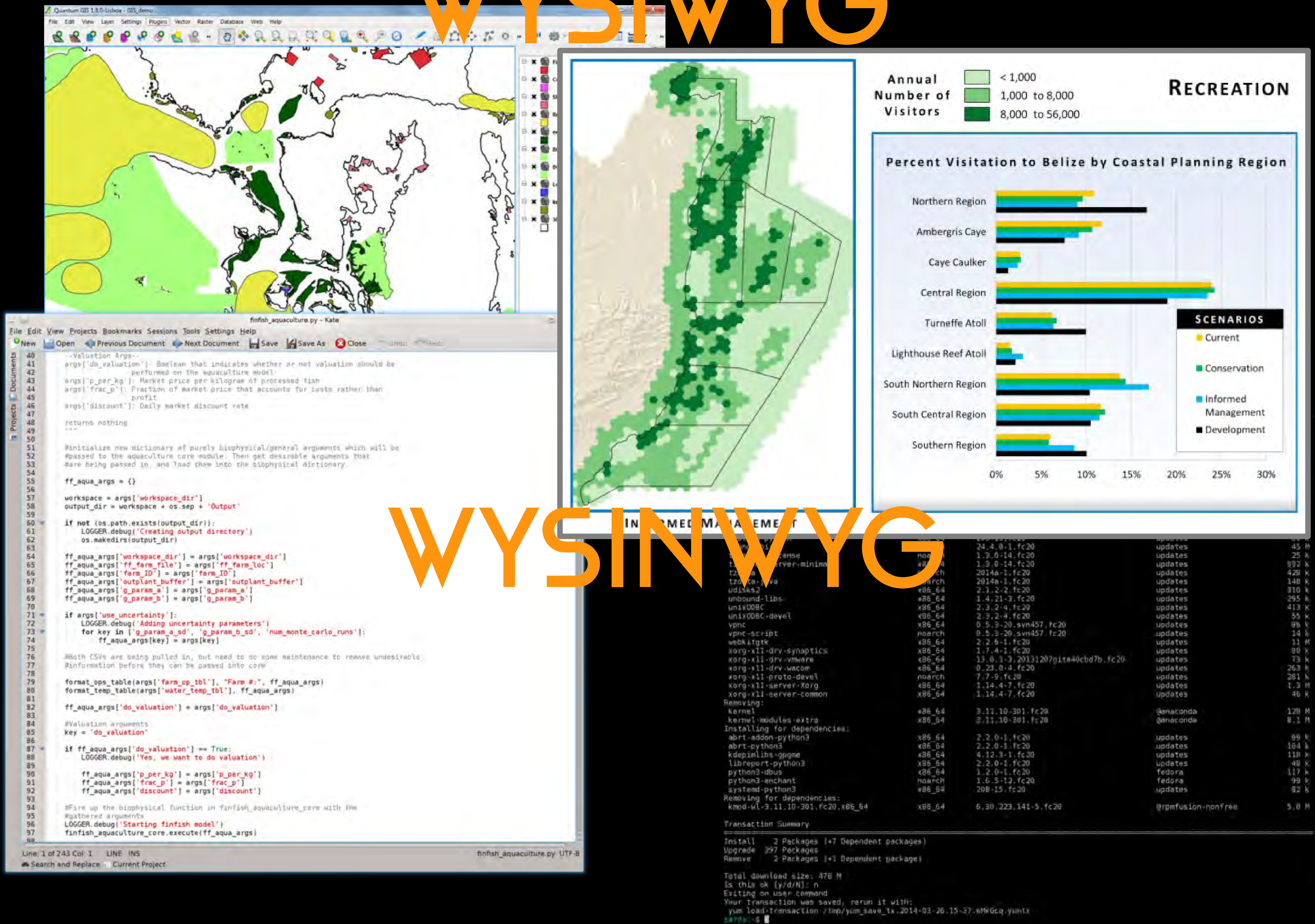
what you see is what you get



WYSINWYG

what you see is not what you get

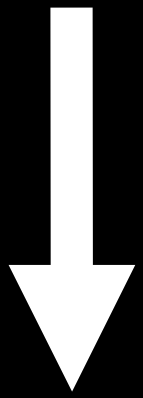
WYSIWYG



WYSINWYG

WYSIWYG

ease of use

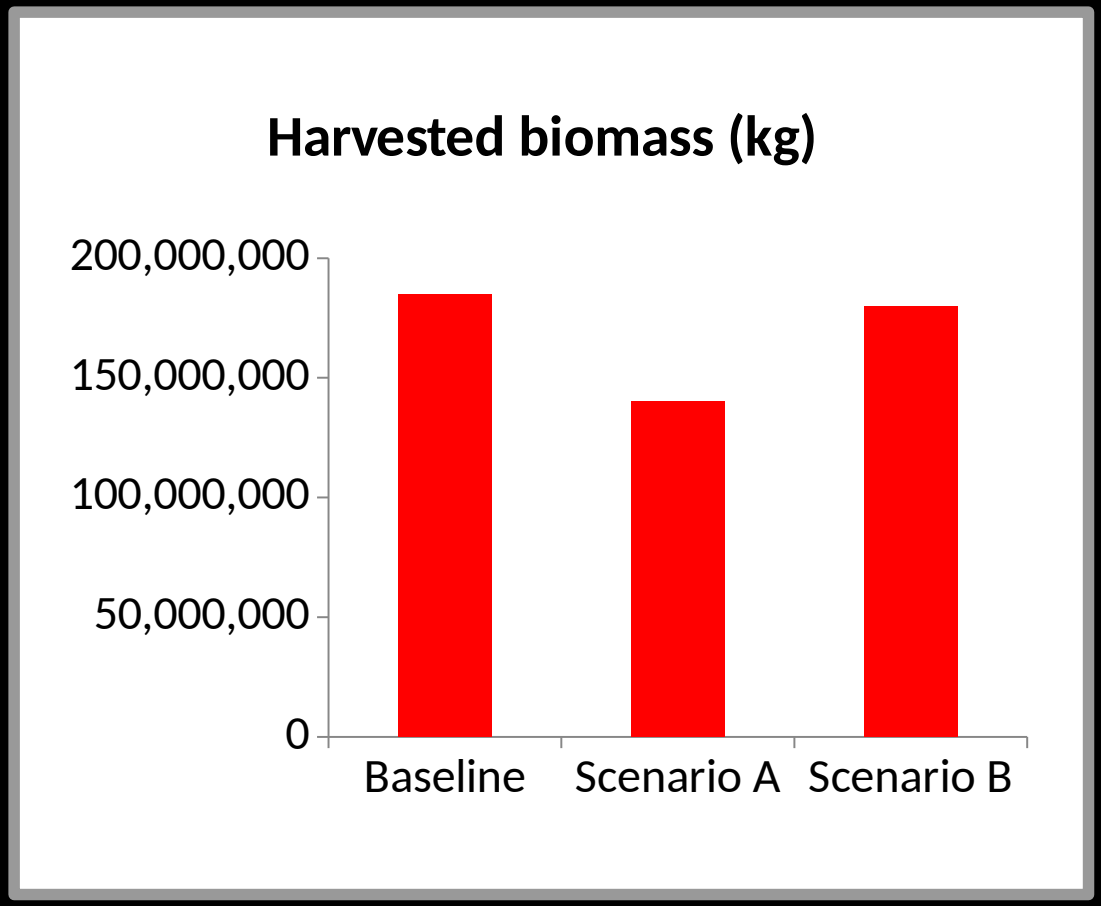


WYSINWYG

customization and quality

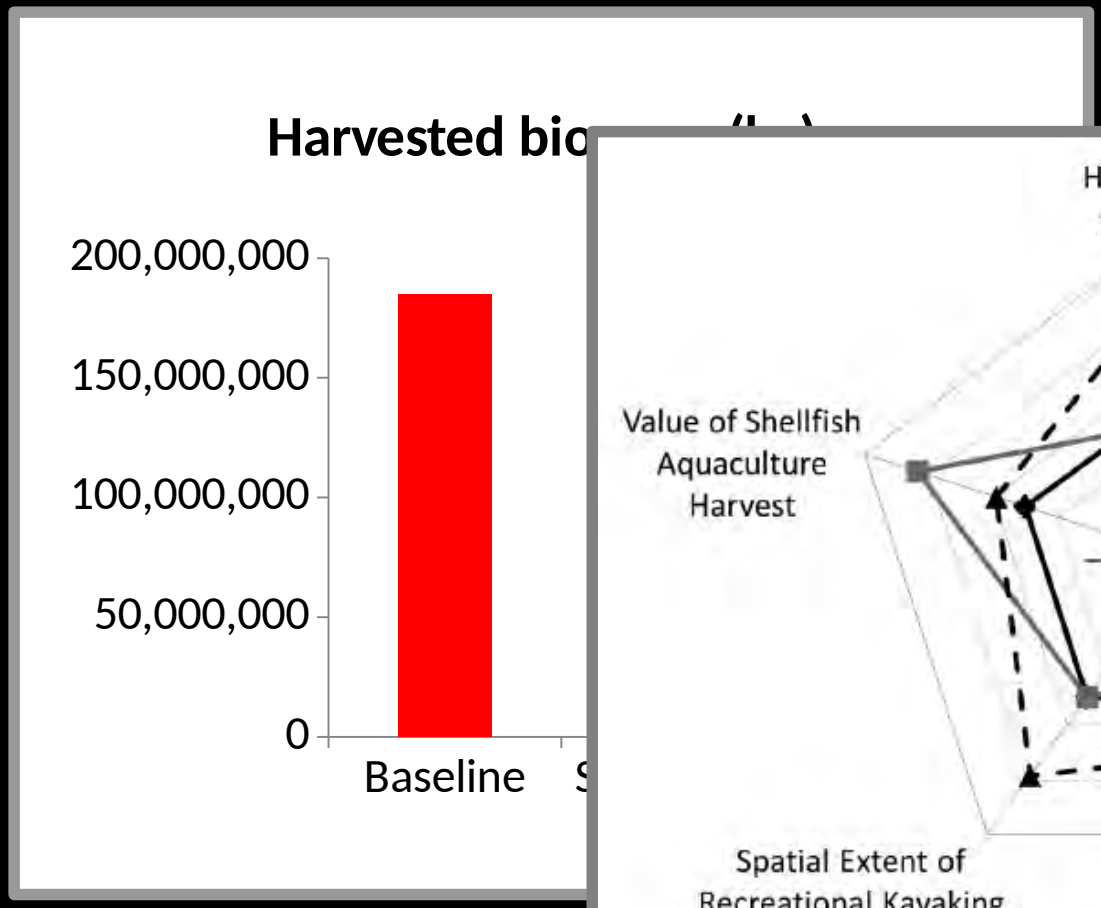
WYSIWYG

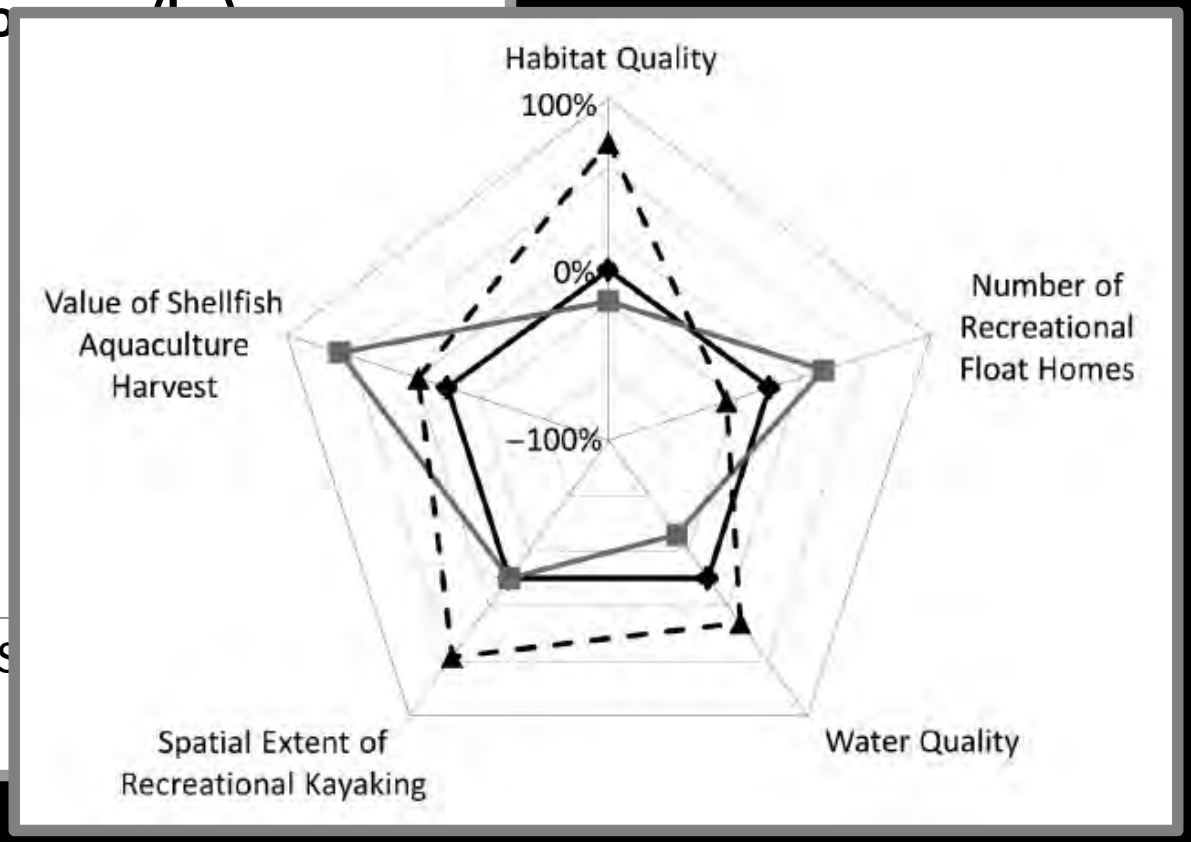
MS excel, powerpoint, Arc, Q, ...



WYSIWYG

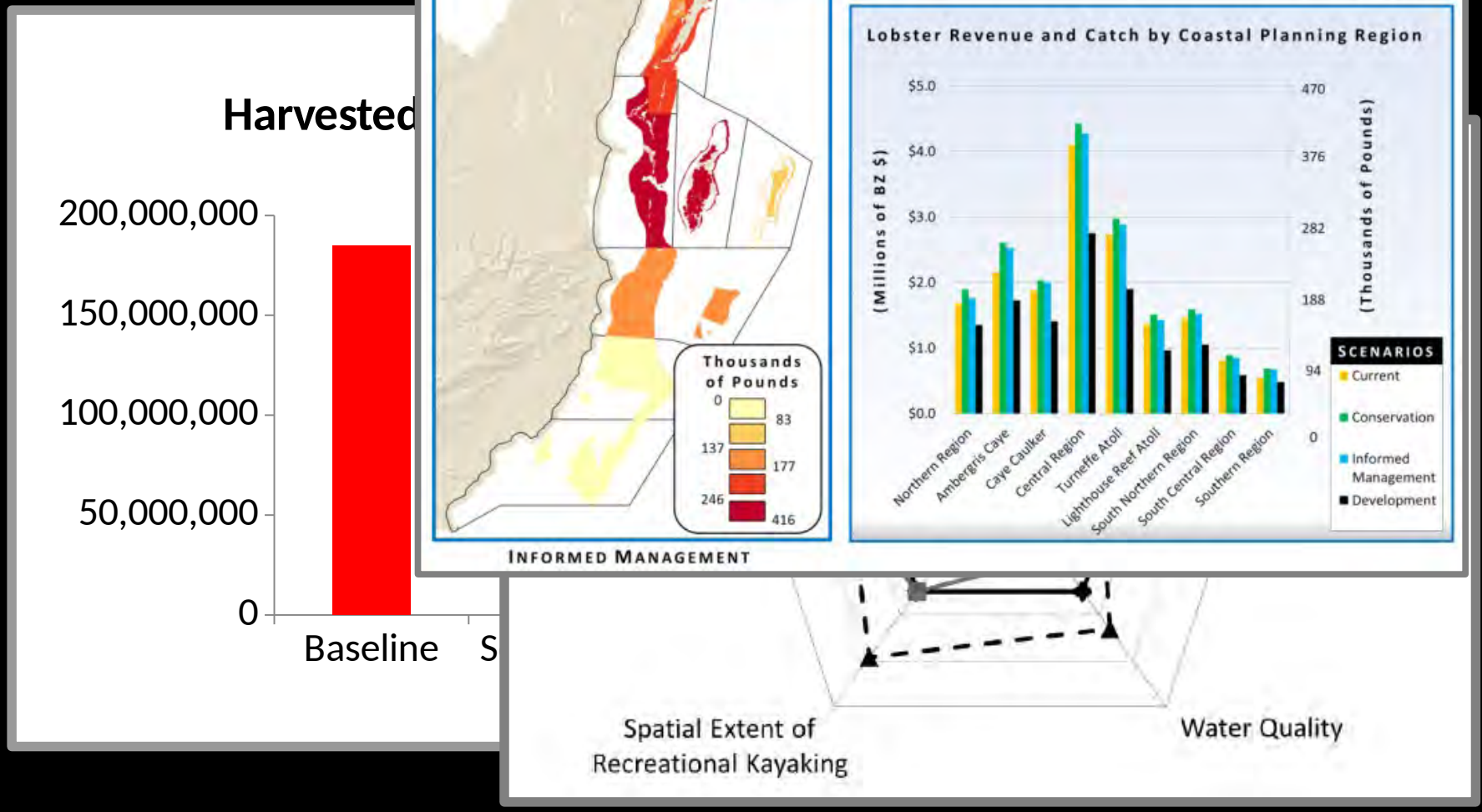
MS excel, powerpoint, Arc, Q, …





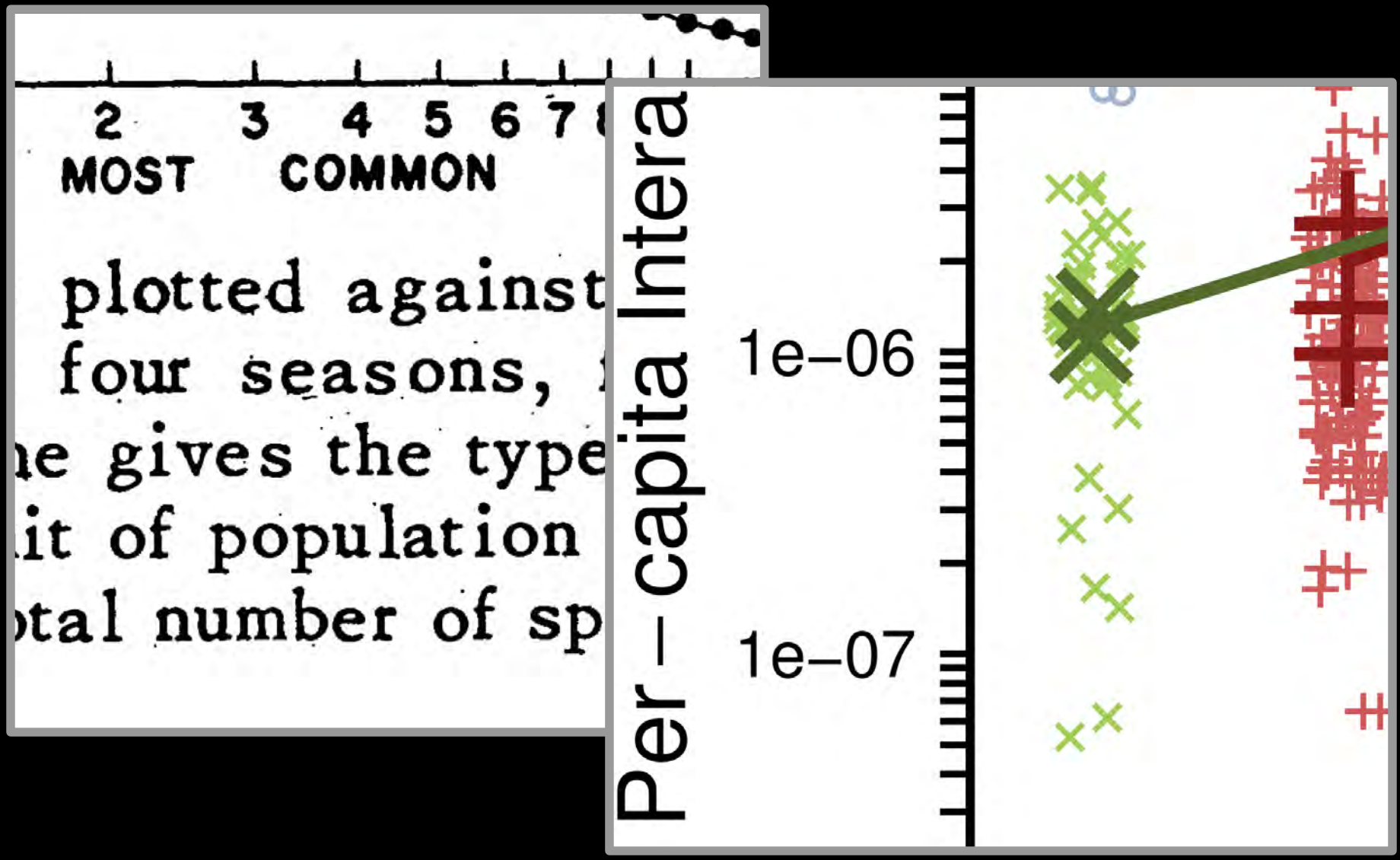
WYSIWYG

MS excel, powerpoint, Arc, Q, …



WYSIWYG

raster versus vector graphics

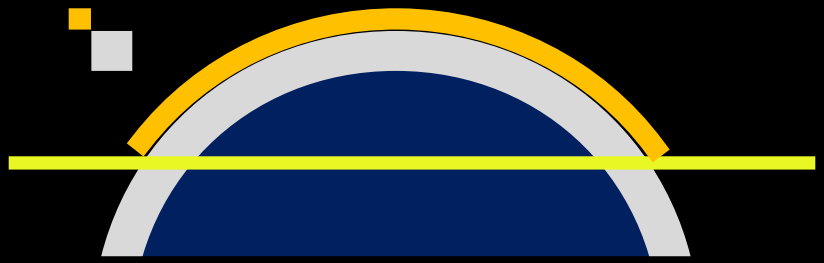


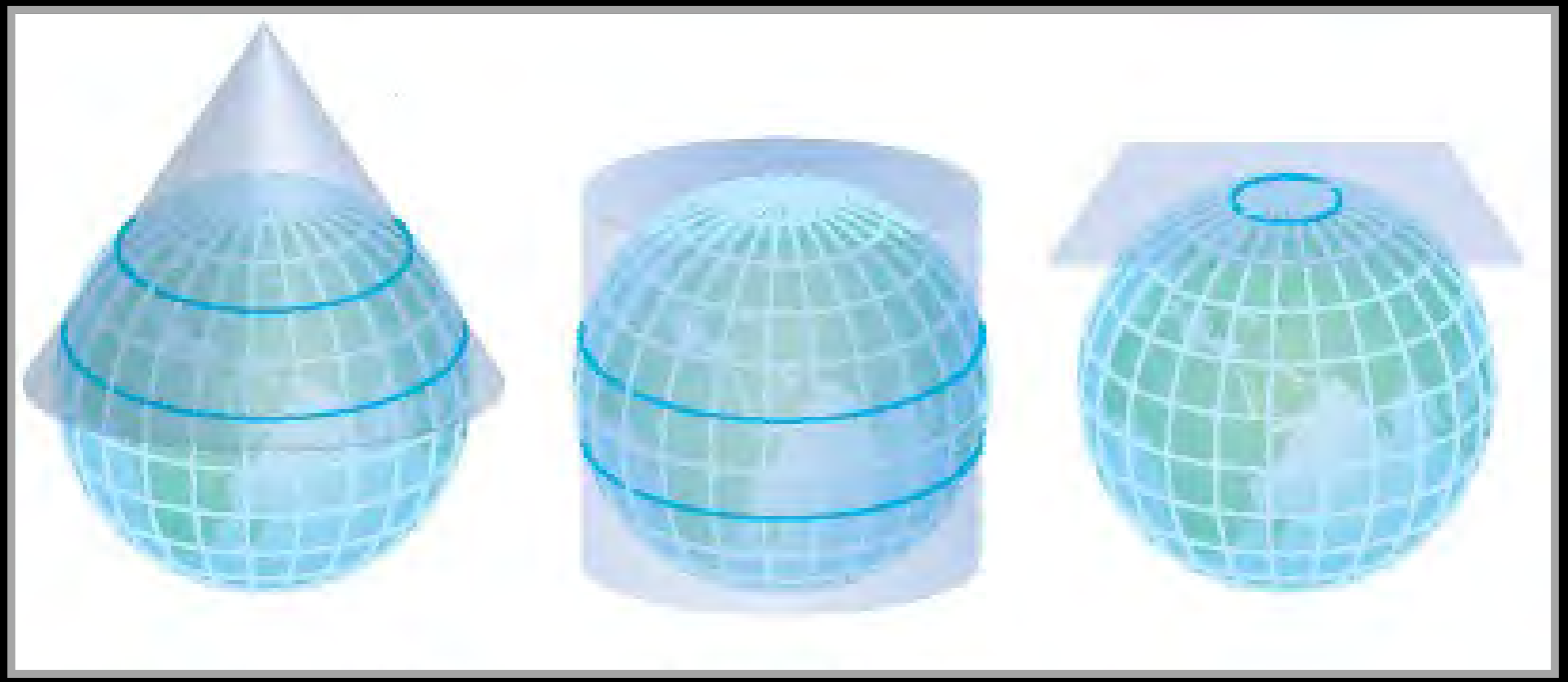
WYSIWYG

MS excel, powerpoint, Arc, Q, ...

GIS

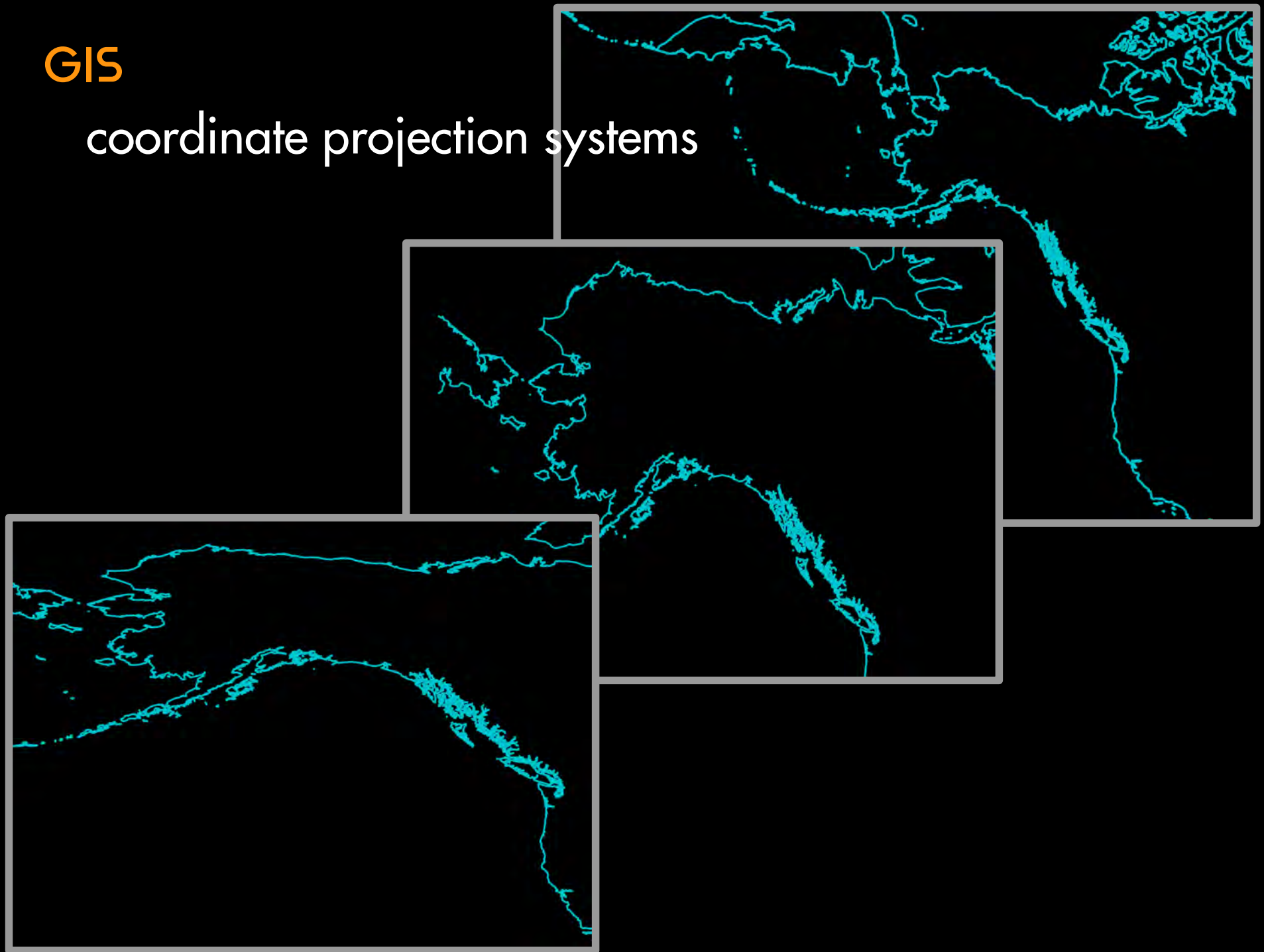
coordinate projection systems





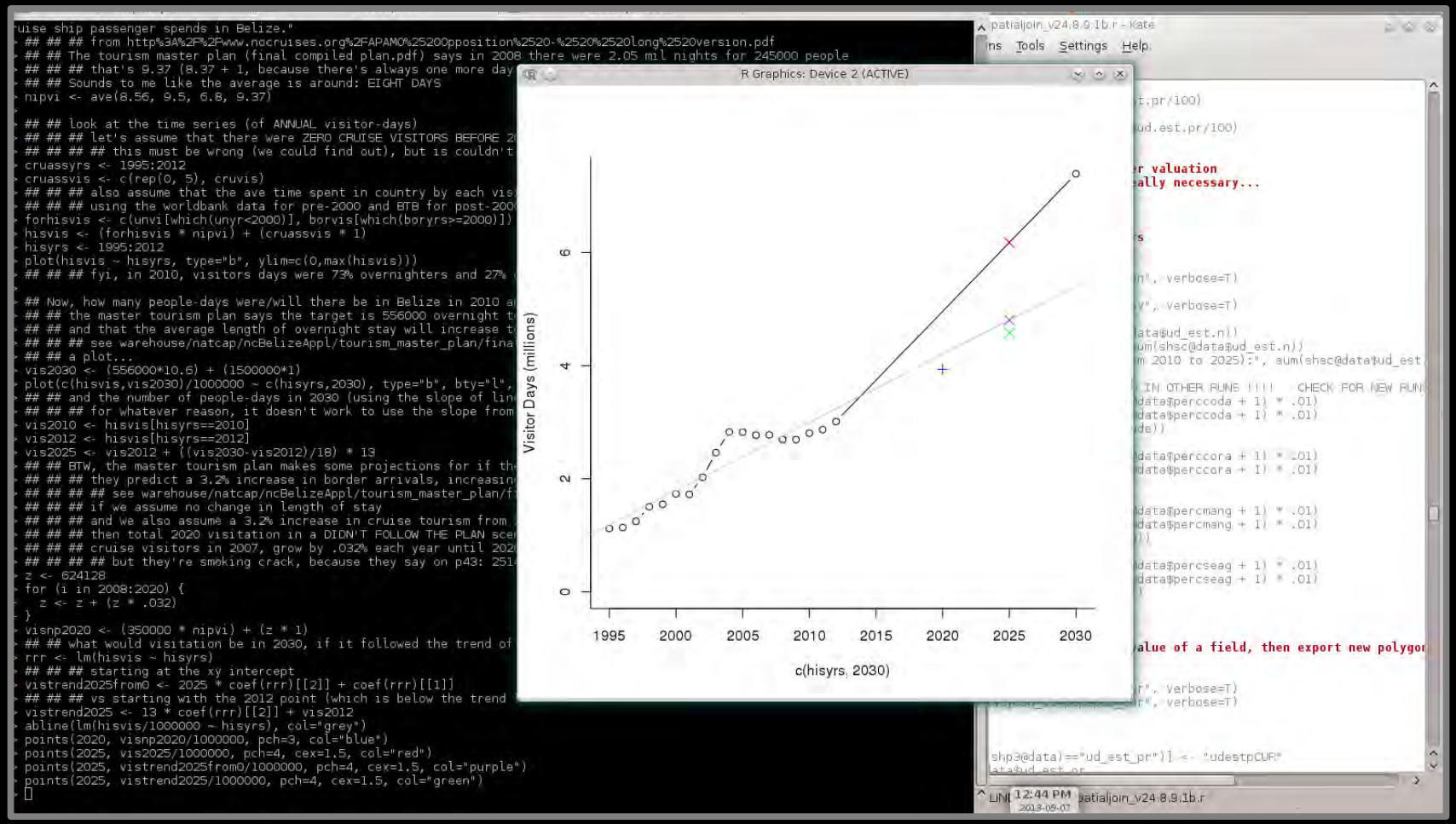
GIS

coordinate projection systems



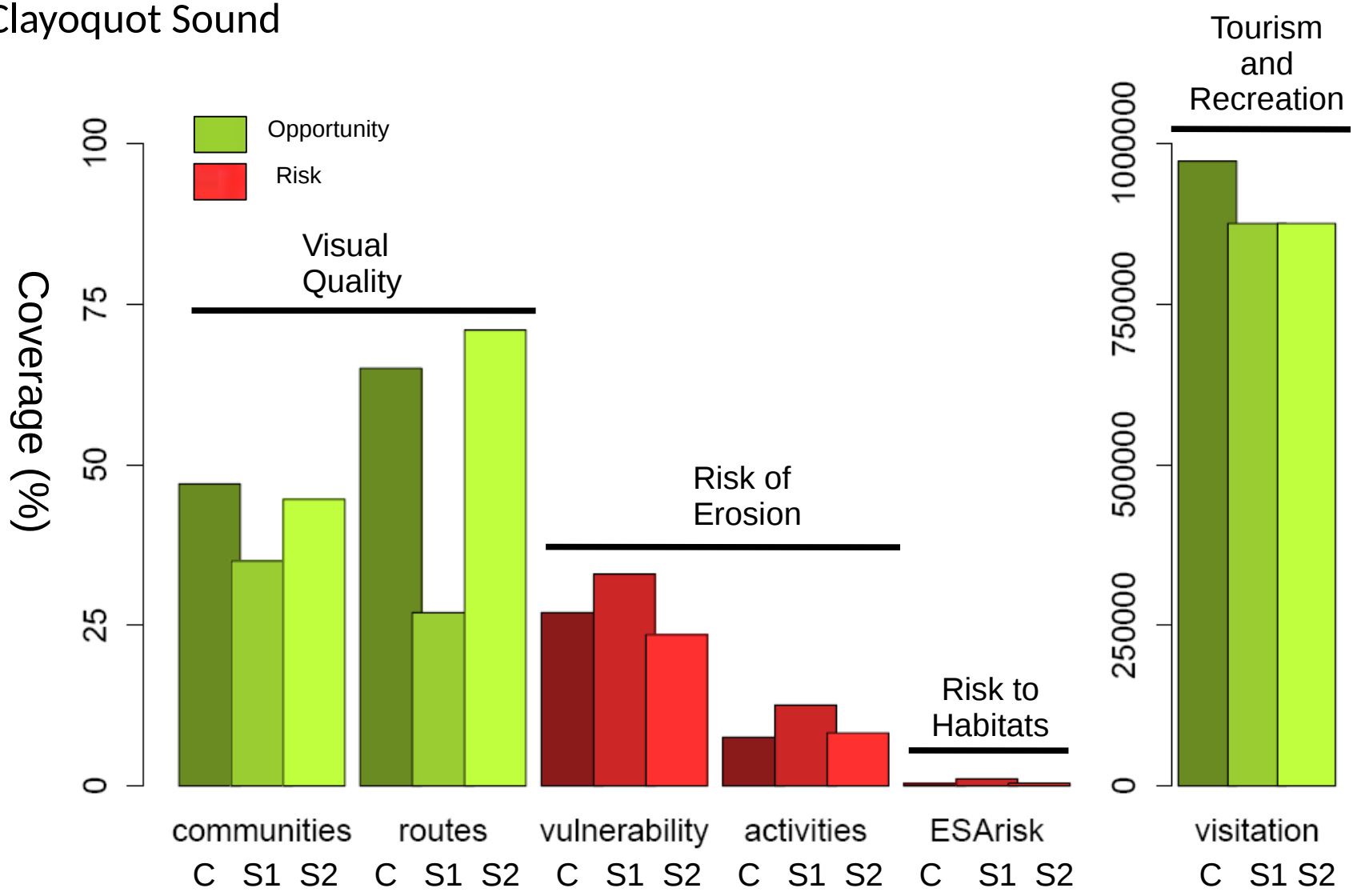
WYSINWYG

R, python, GRASS, ...



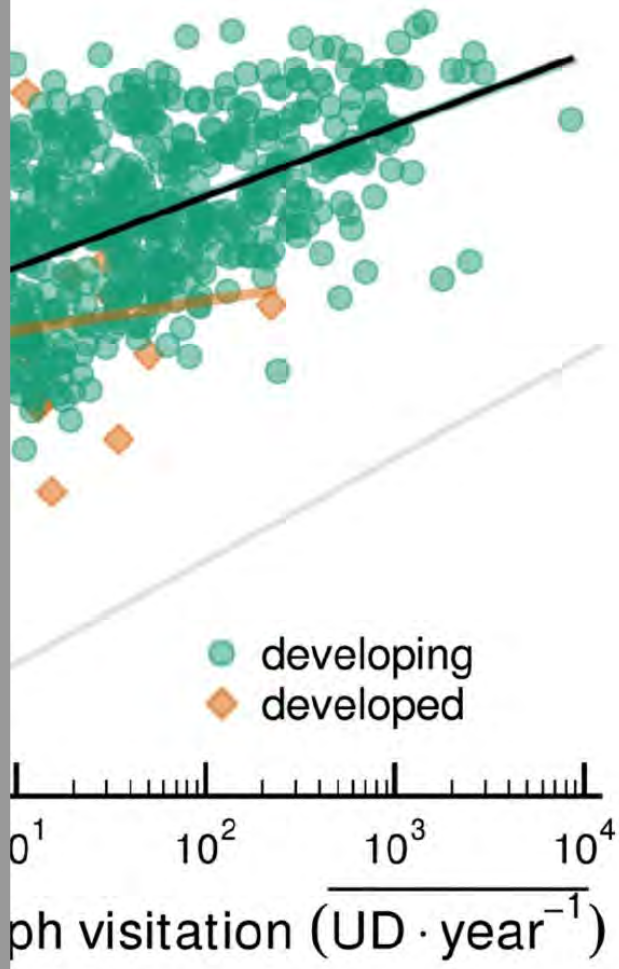
Sound-wide Tradeoffs
Ecosystem service metrics for scenarios

Clayoquot Sound



(for demonstration only)

tes in 31 countries with data generated
phs uploaded to flickr shows that the



ph-based and empirical estimates of user-
d according to whether they are located in a
les [n = 35]) or high (orange diamonds [n =

types, *A*, and it is only the height of the function that varies. I

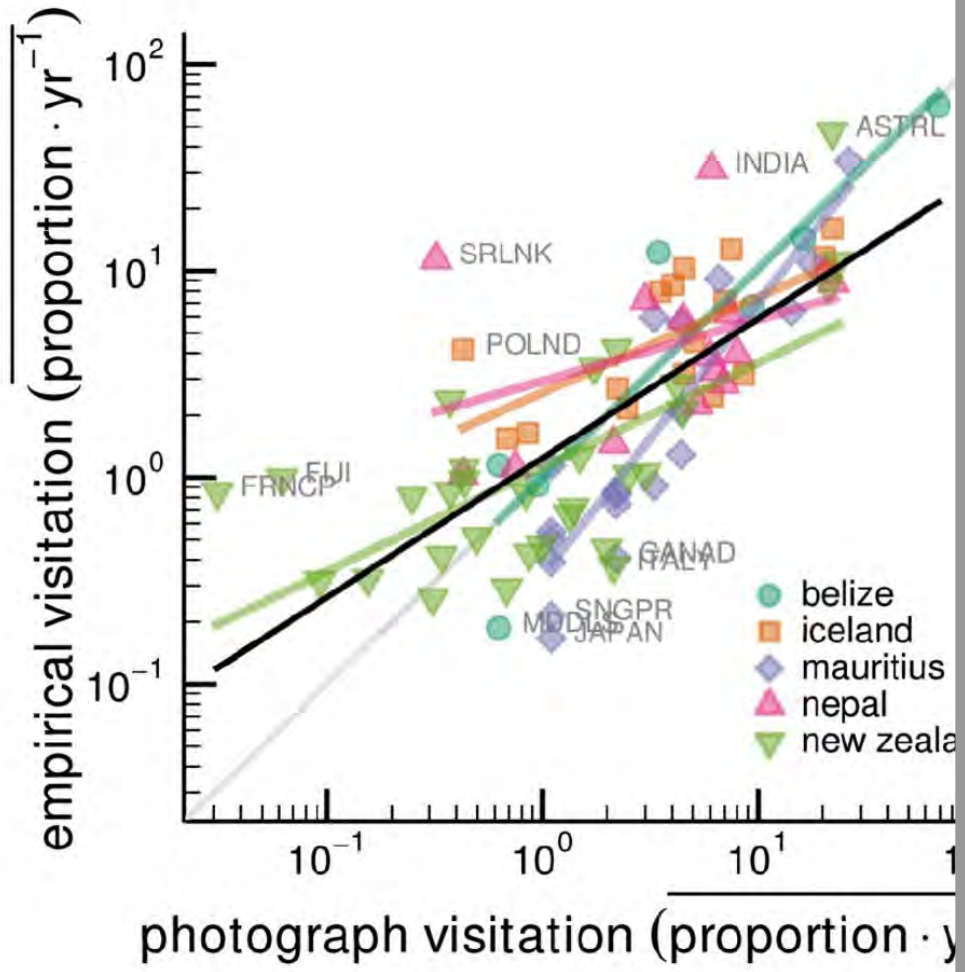
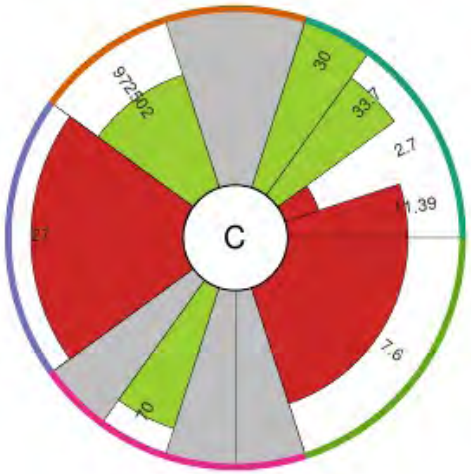
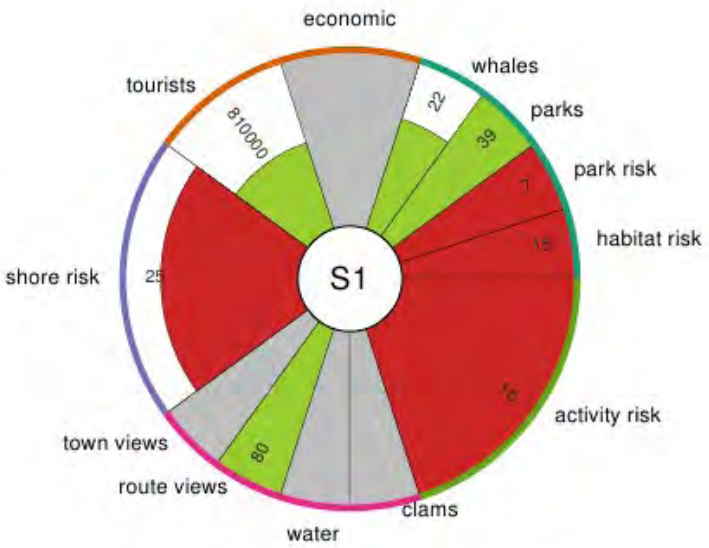


**Figure 5 | The average proportion and originating country of tra
who arrived to five destination countries each year, according to
home locations of flickr users who took at least one photograph
the country (x-axis) and immigration data (y-axis).** Names of ou
originating countries are abbreviated. Datasets are distinguished b

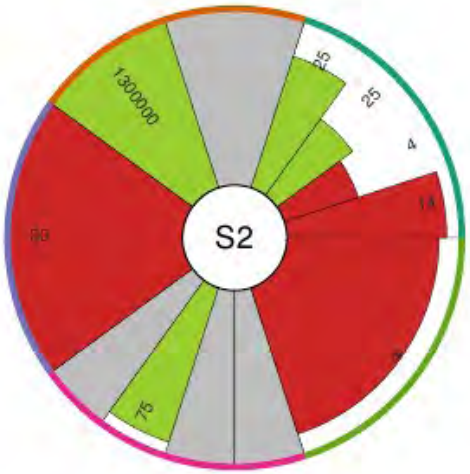
current

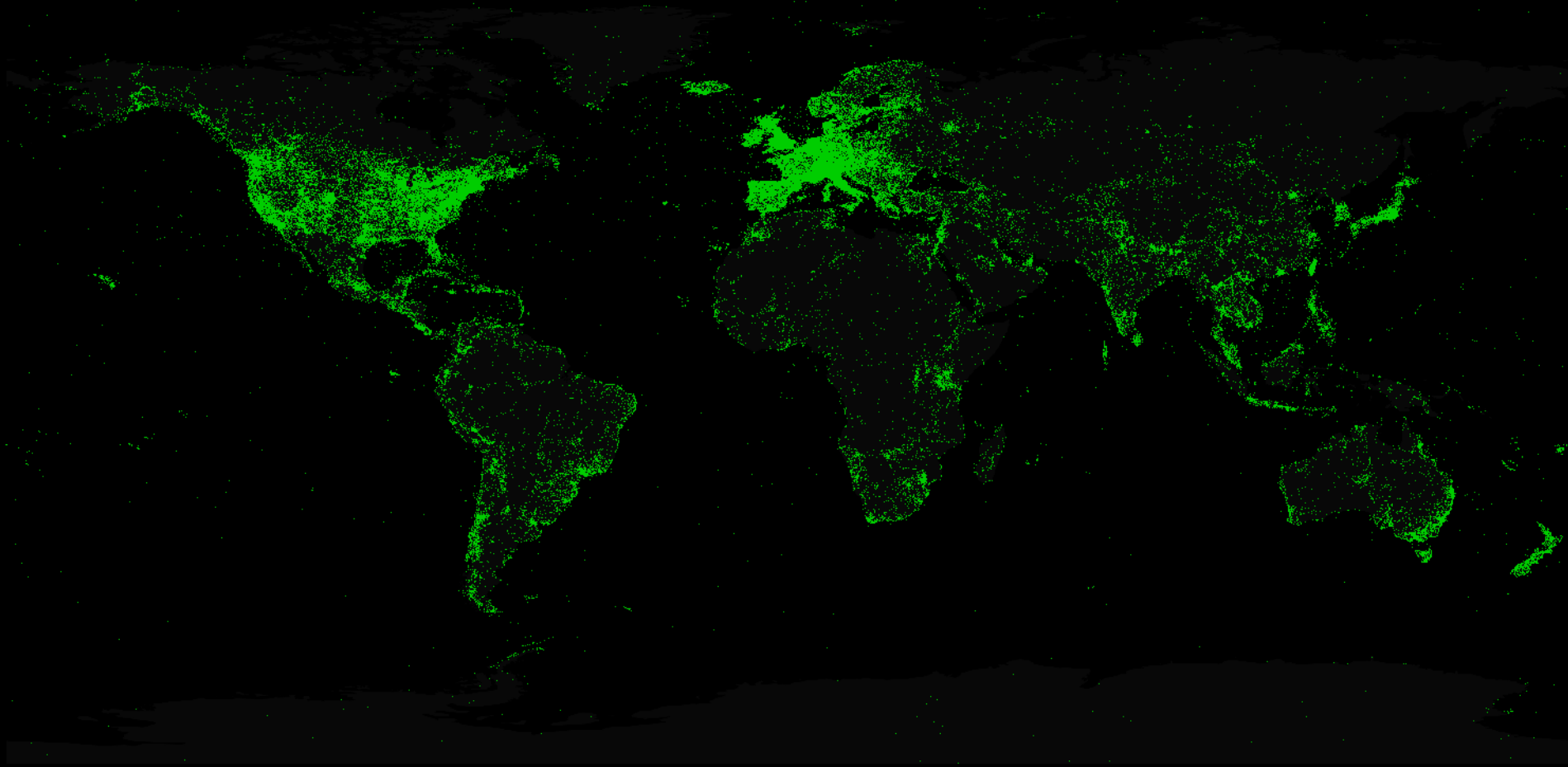


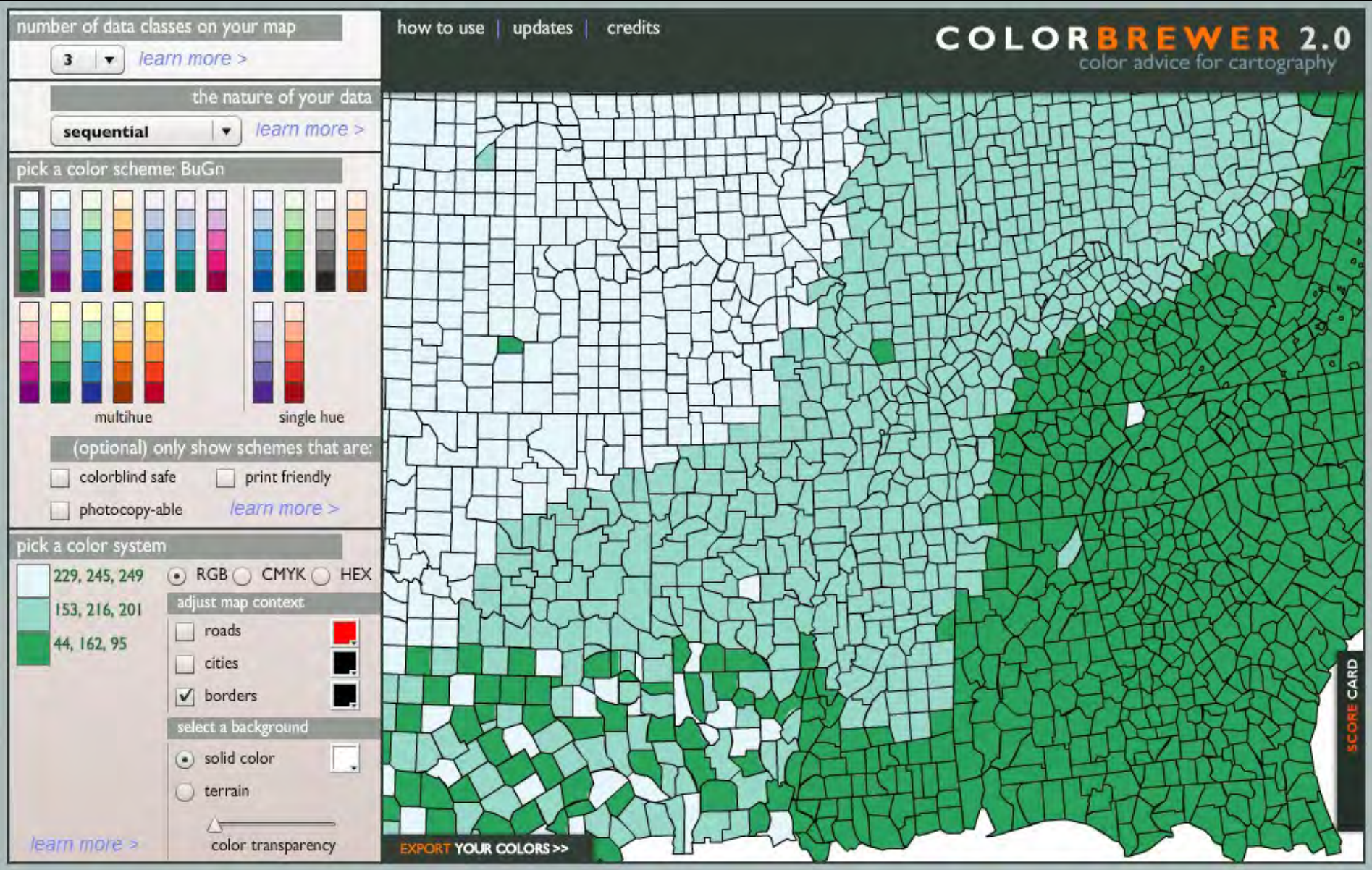
scenario 1



scenario 2

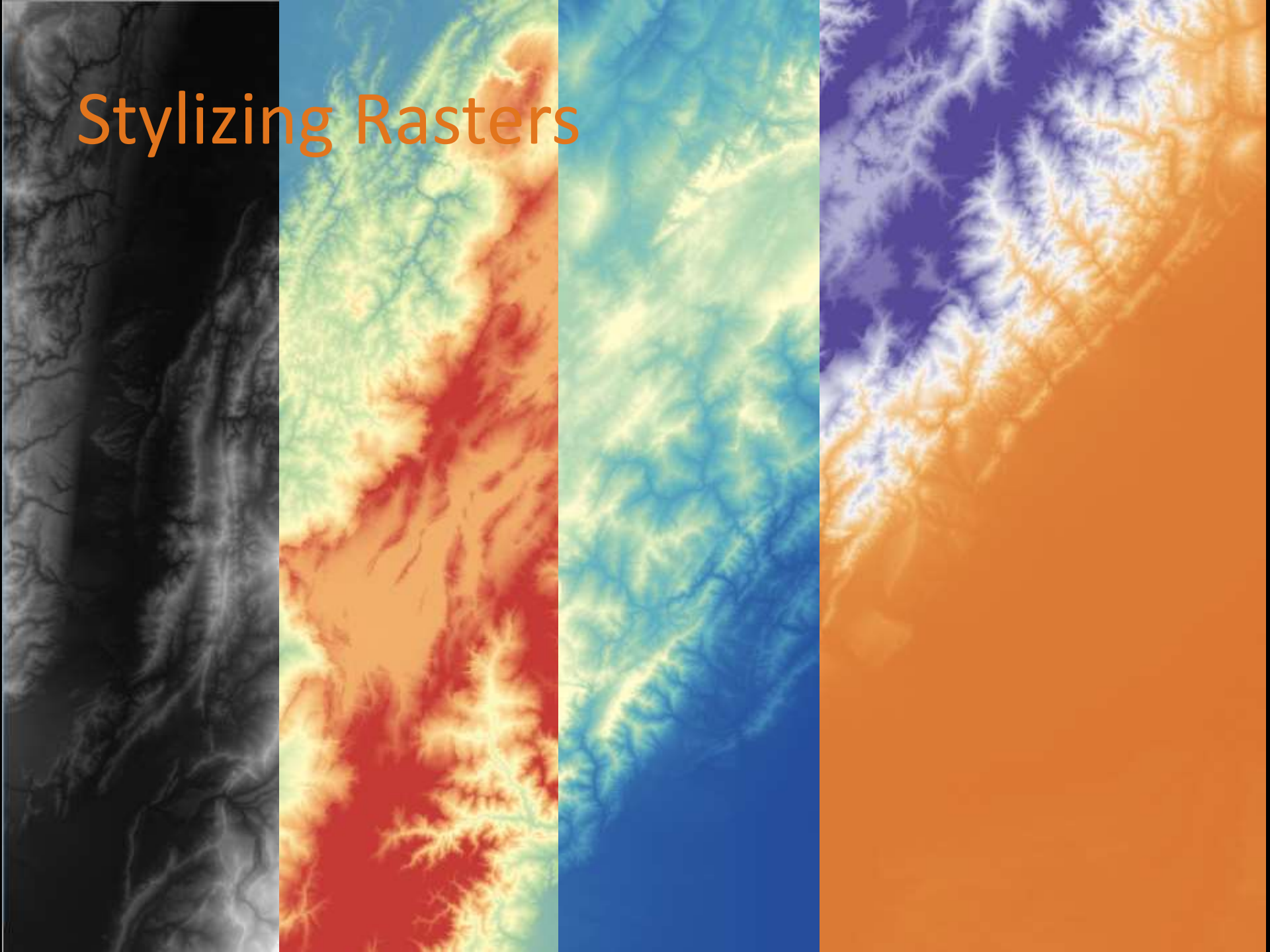



n = 200 million

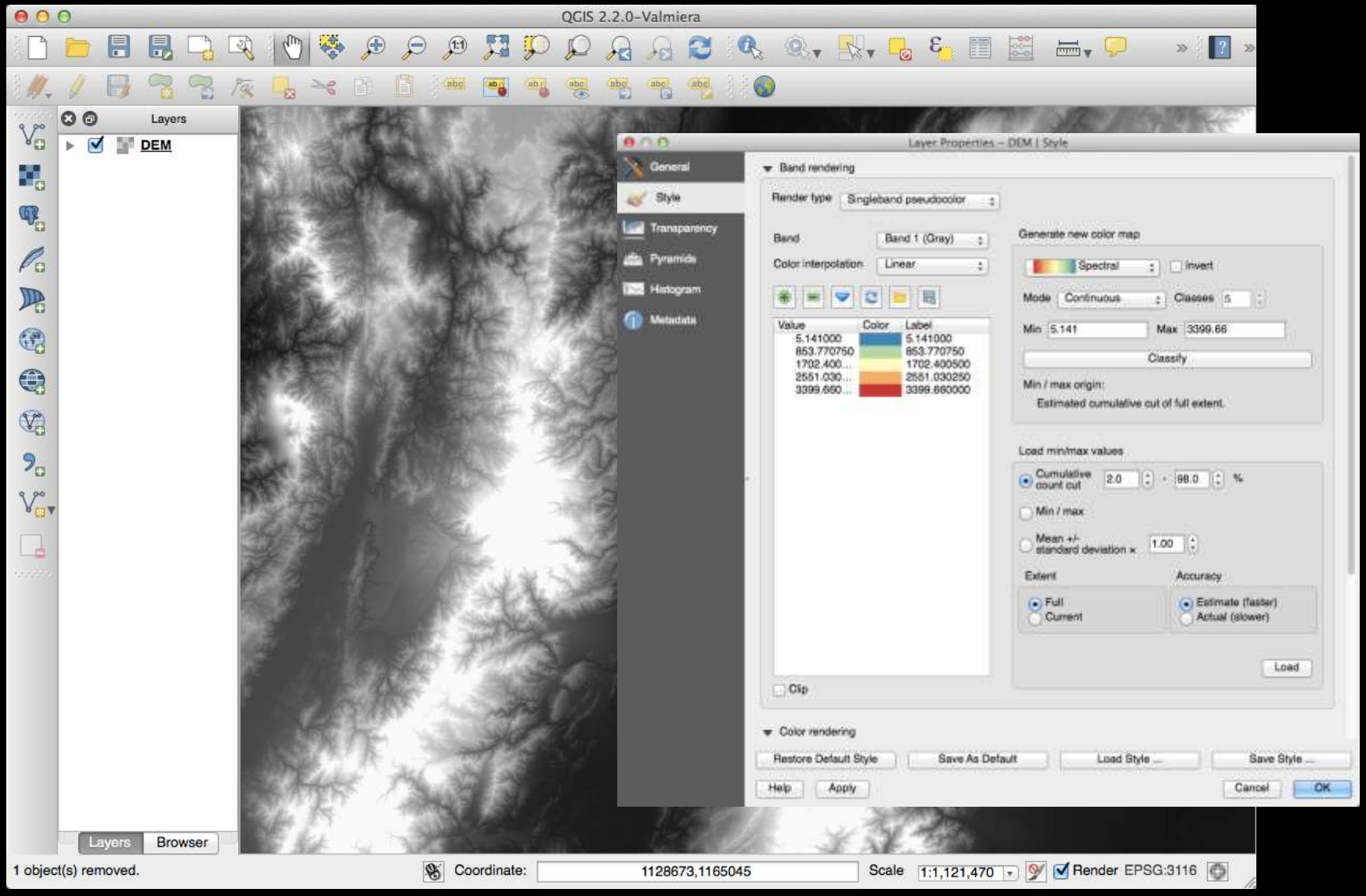


www.colorbrewer2.org

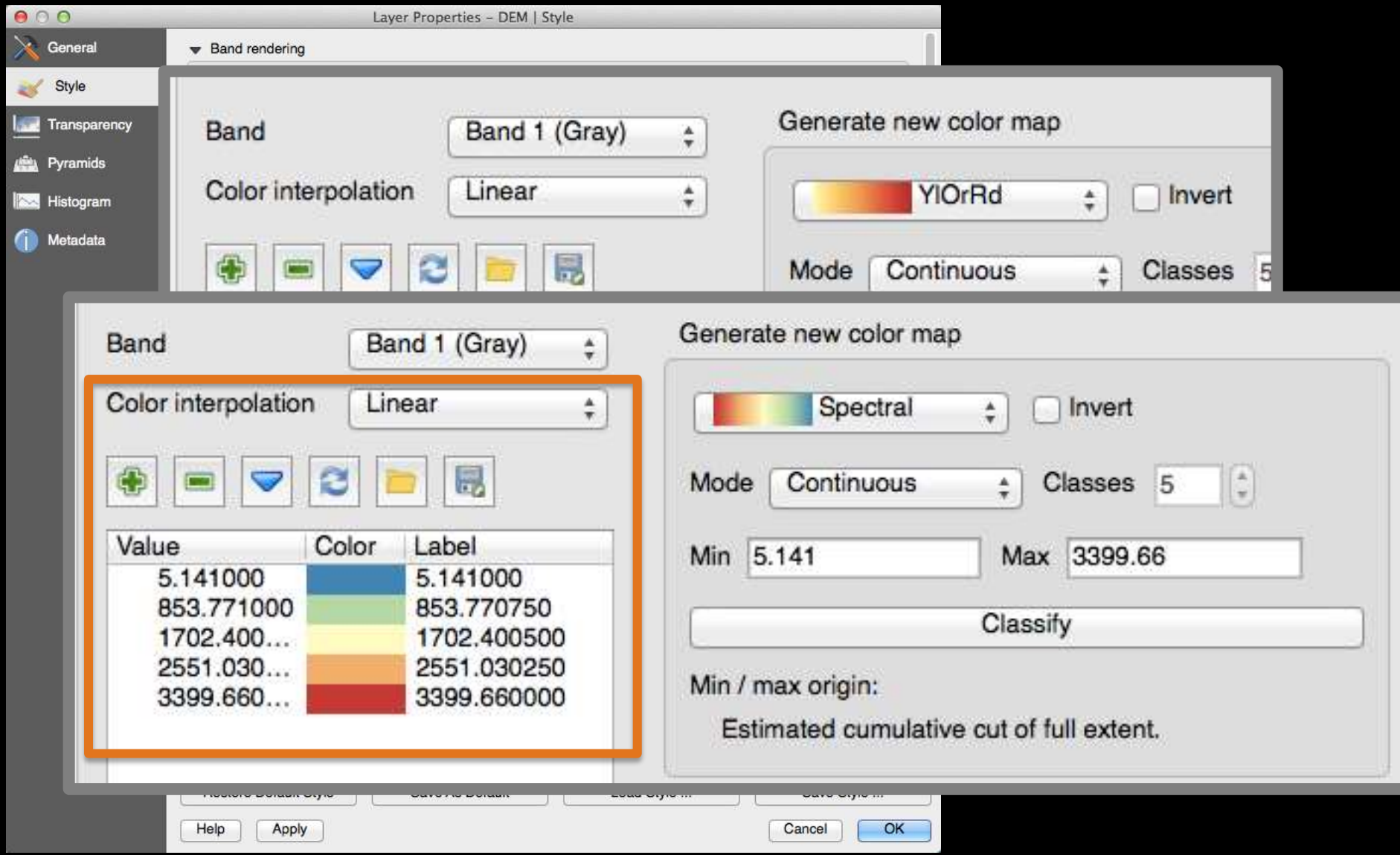
Stylizing Rasters



WYSIWYG

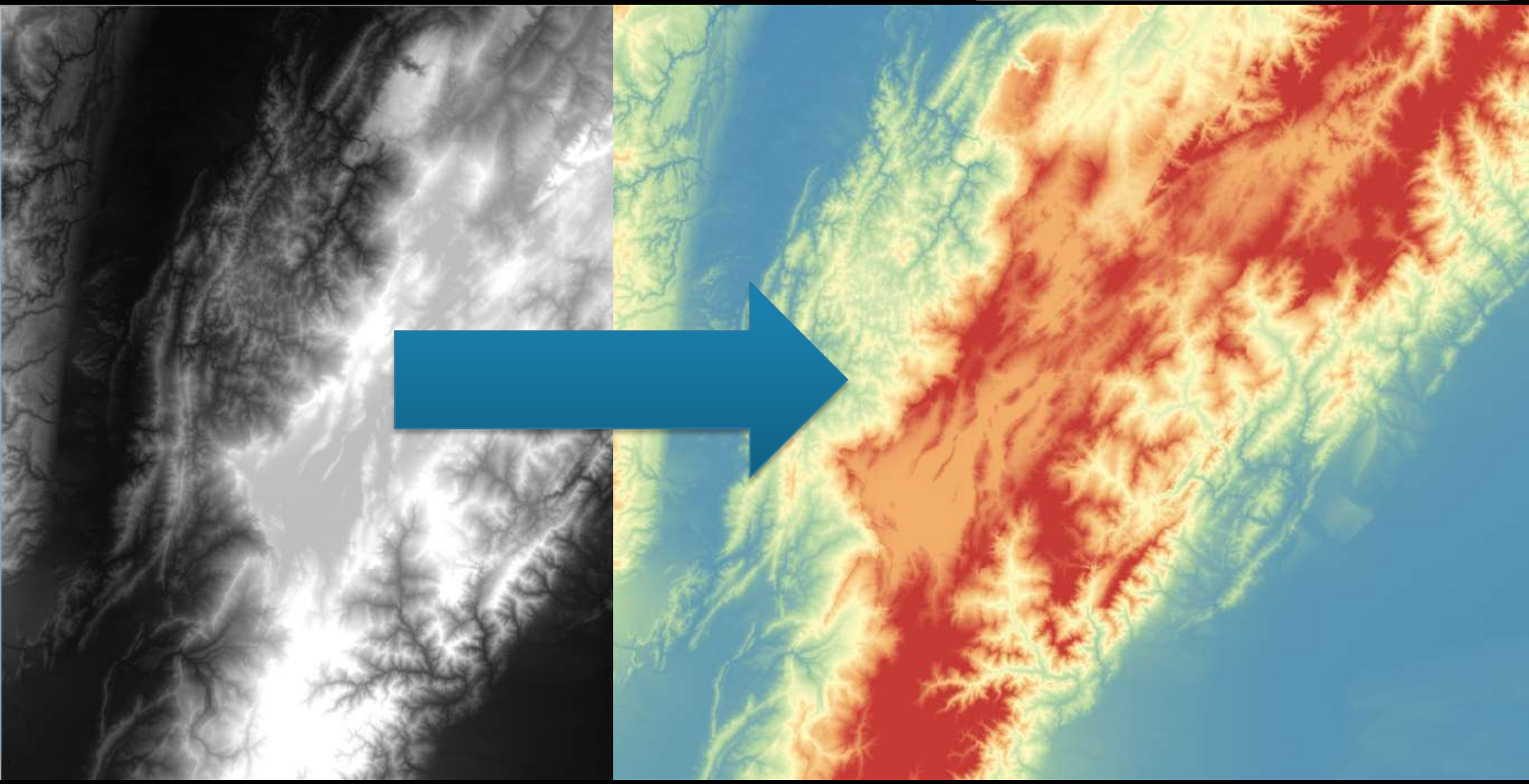

QGIS 2.2.0-Valmiera
Layers
DEM
Layer Properties – DEM | Style
General
Style
Transparency
Pyramids
Histogram
Metadata
Band rendering
Render type
Singleband pseudocolor
Band
Band 1 (Gray)
Color interpolation
Linear
Generate new color map
Spectral
Invert
Mode
Continuous
Classes
Min
5.141
Max
3399.66
Classify
Min / max origin:
Estimated cumulative cut of full extent.
Load min/max values
Cumulative count cut
2.0
98.0
Min / max
Mean +/- standard deviation x
1.00
Extent
Full
Current
Accuracy
Estimate (faster)
Actual (slower)
Load
Clip
Color rendering
Restore Default Style
Save As Default
Load Style ...
Save Style ...
Help
Apply
Cancel
OK
Layers
Browser
1 object(s) removed.
Coordinate:
1128673,1165045
Scale
1:1,121,470
Render
EPSG:3116

Built-in Color Schemes

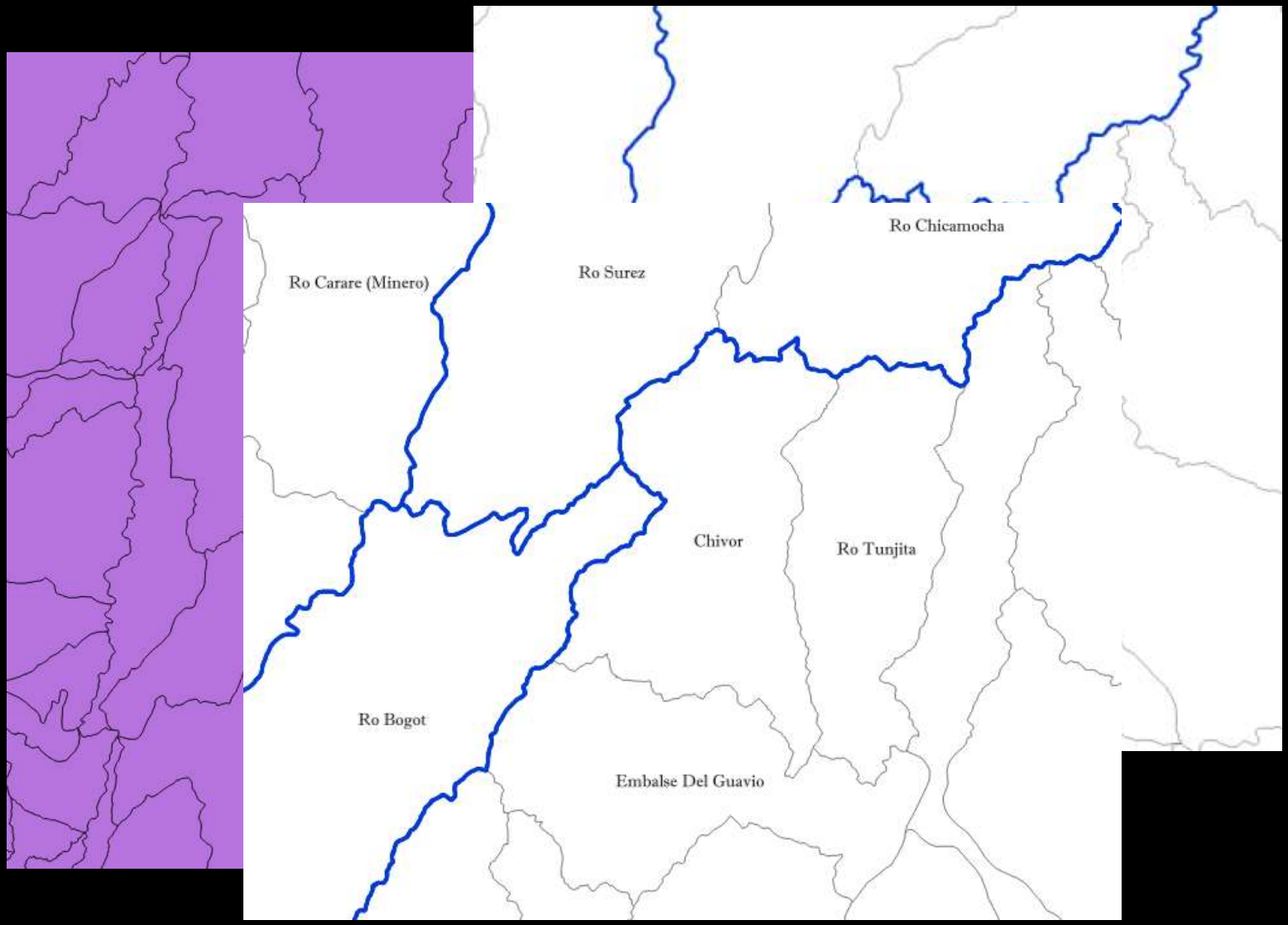


Built-in Color Schemes

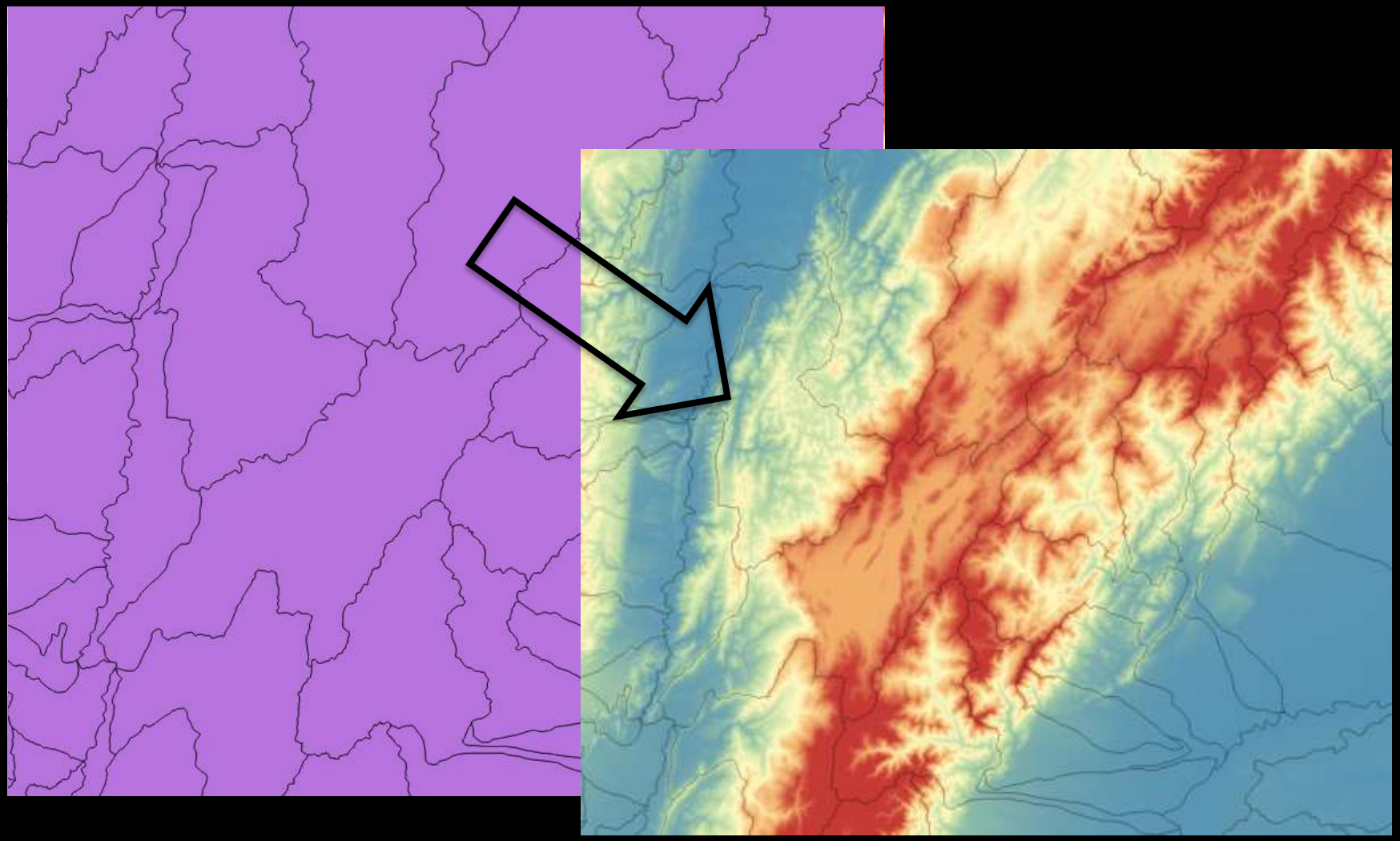
Value	Color	Label
5.141000		5.141000
853.771000		853.770750
1702.400…		1702.400500
2551.030…		2551.030250
3399.660…		3399.660000



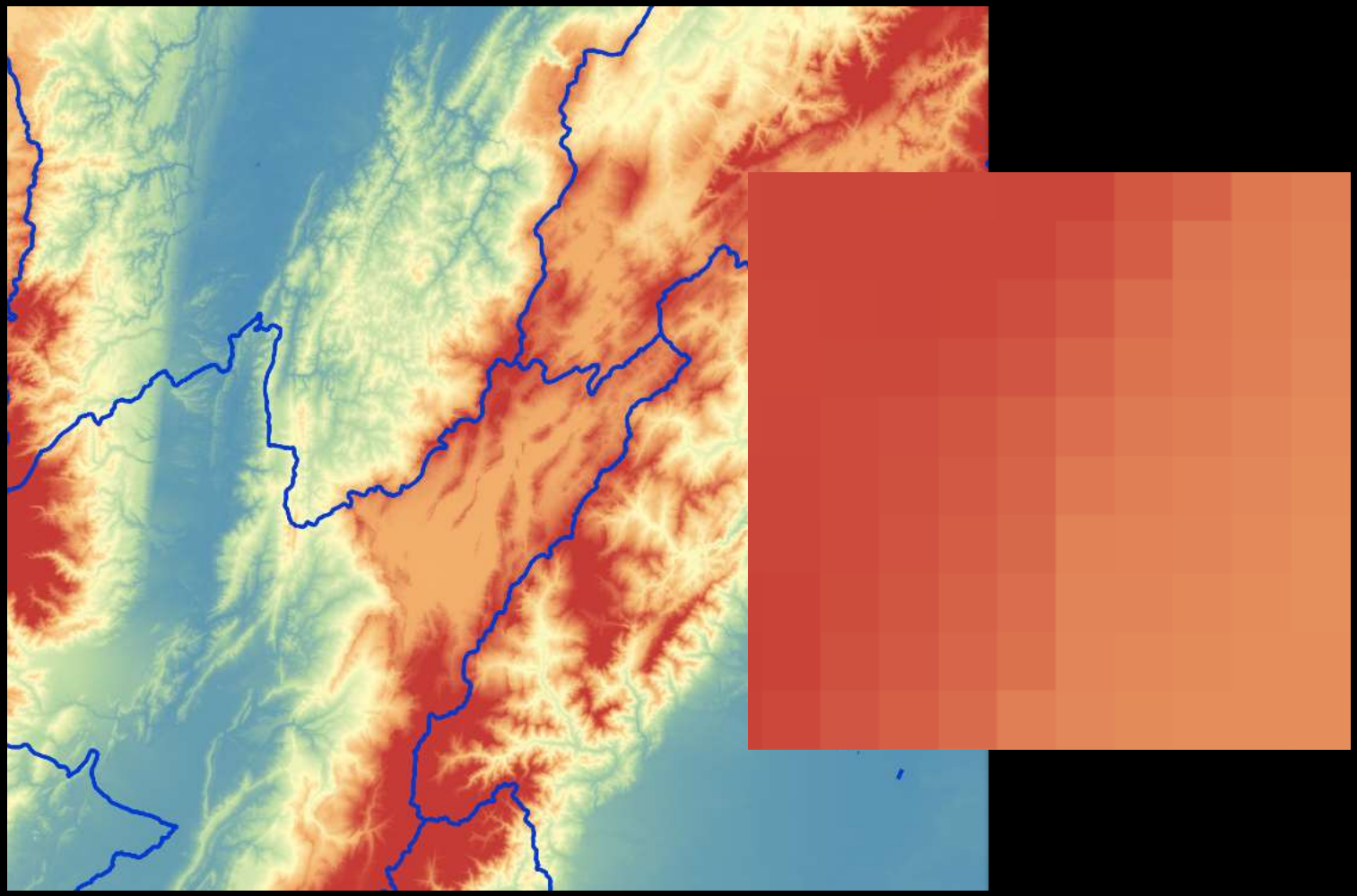
Stylizing Vectors



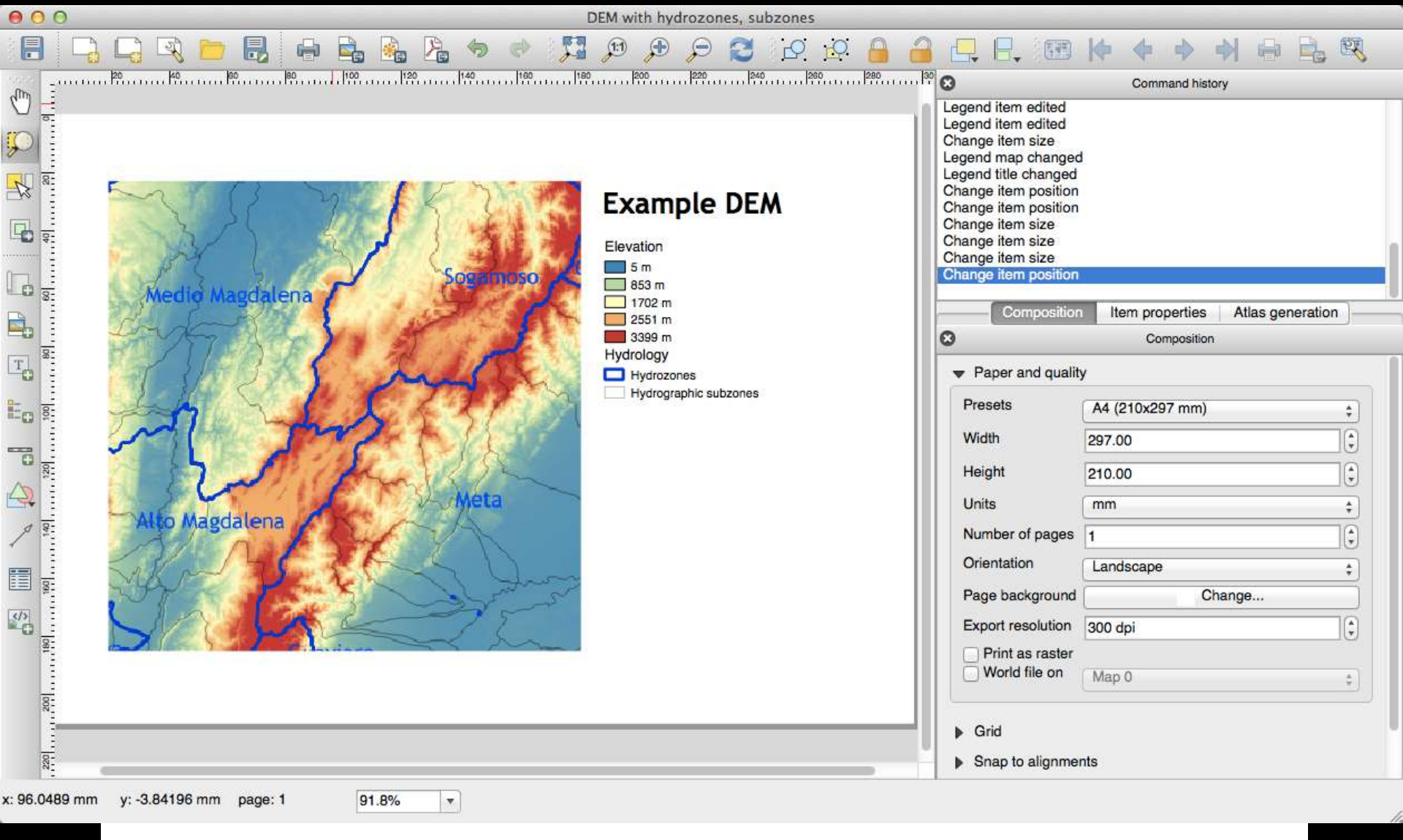
Transparency



Combining Raster + Vector Layers



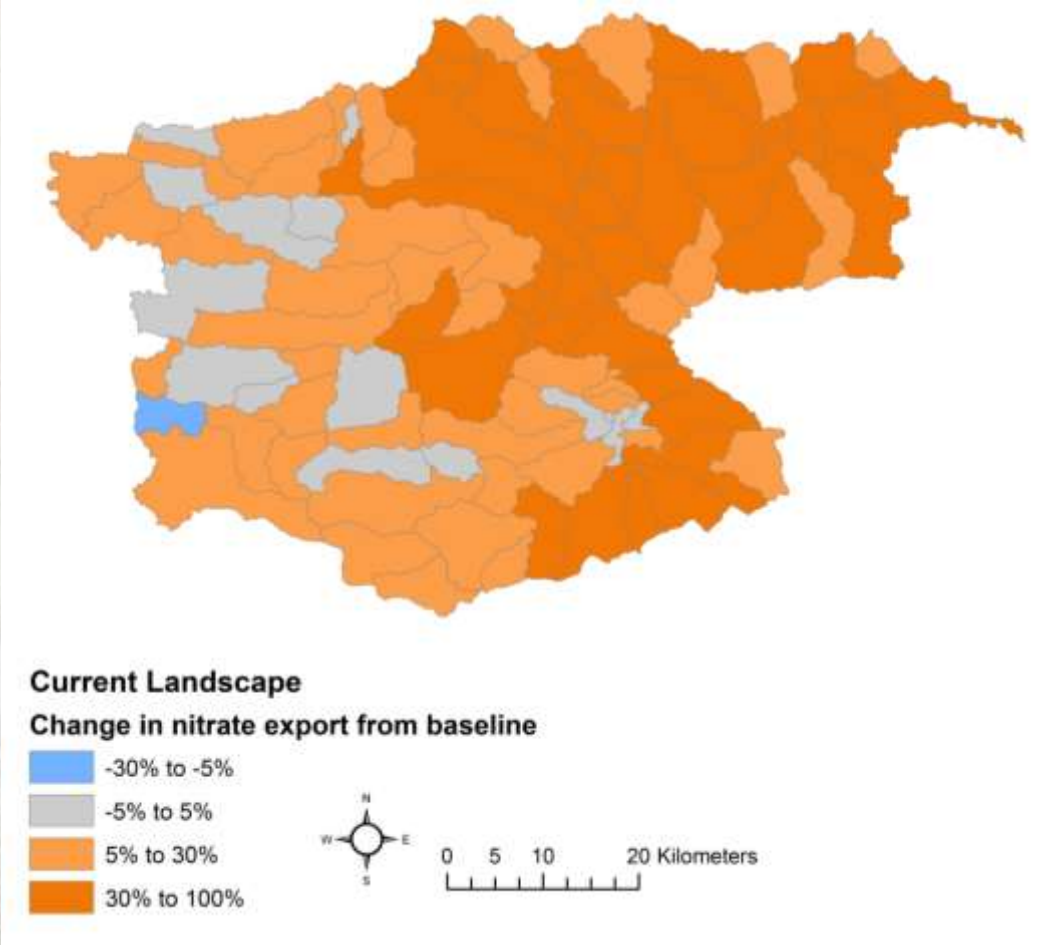
Annotating Maps

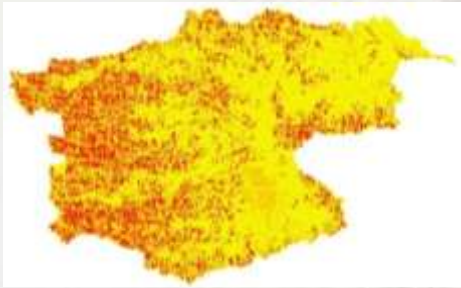


WYSIWYG

(But it’s pretty flexible)

VISUALIZING RESULTS


Current Landscape
Change in nitrate export from baseline
-30% to -5%
-5% to 5%
5% to 30%
30% to 100%
N
W
E
S
0 5 10 20 Kilometers



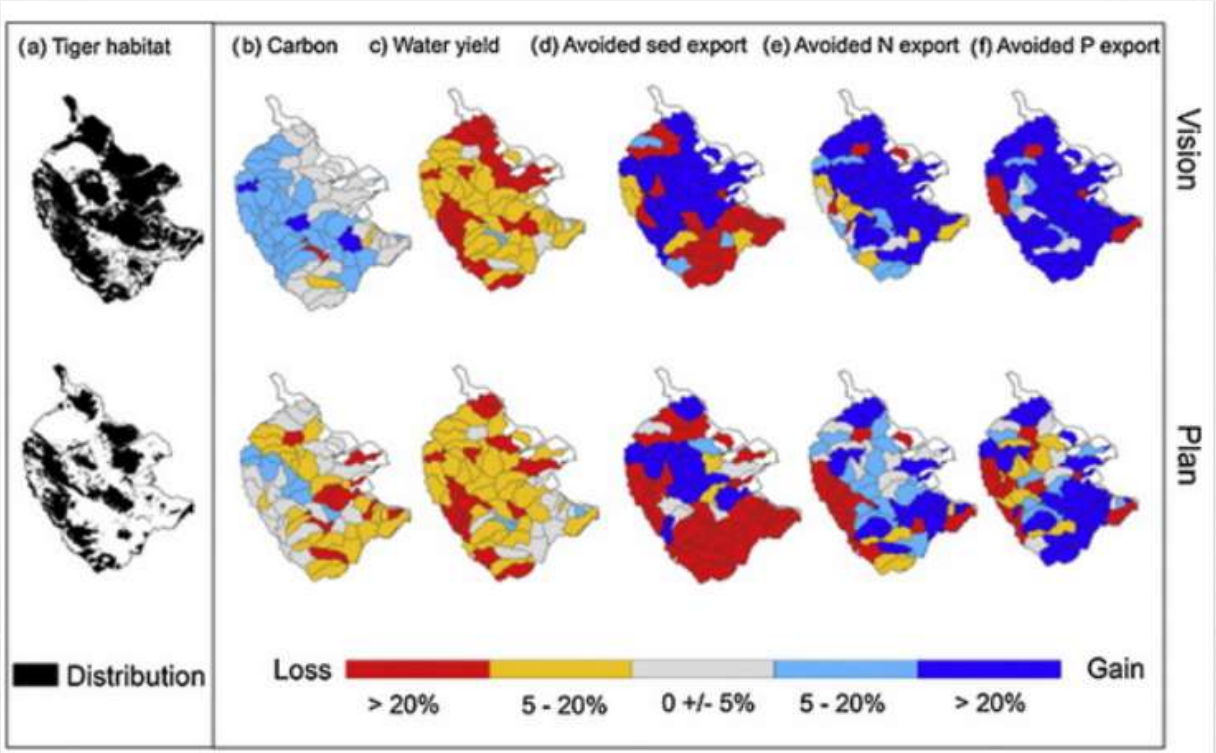
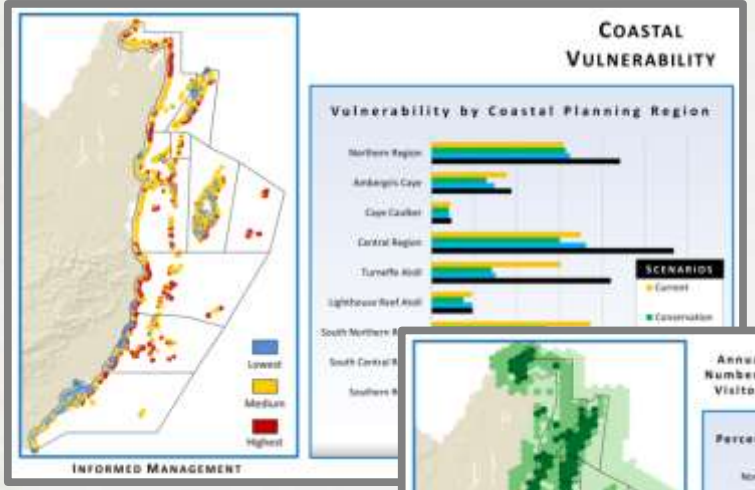


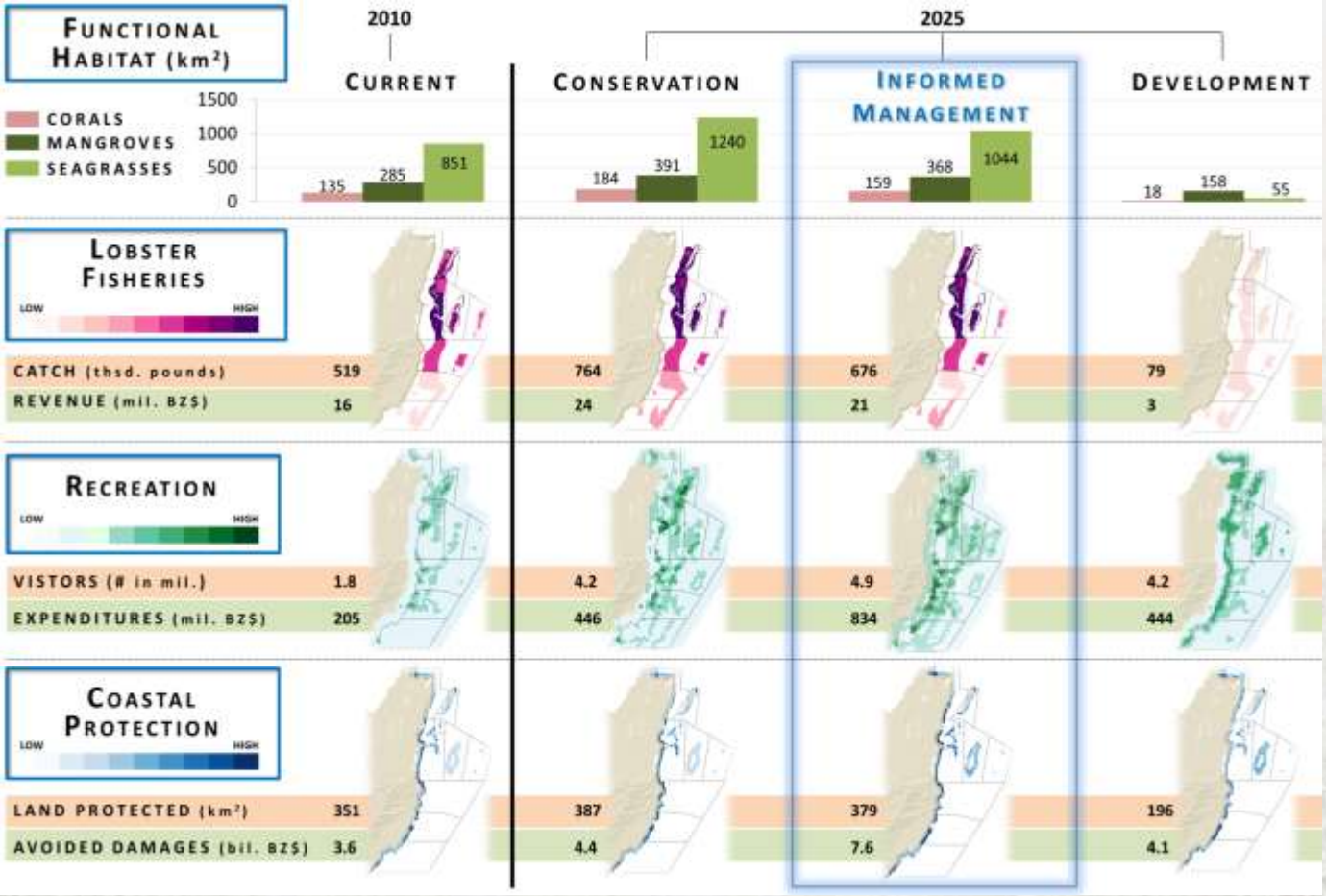
Fig. 7.

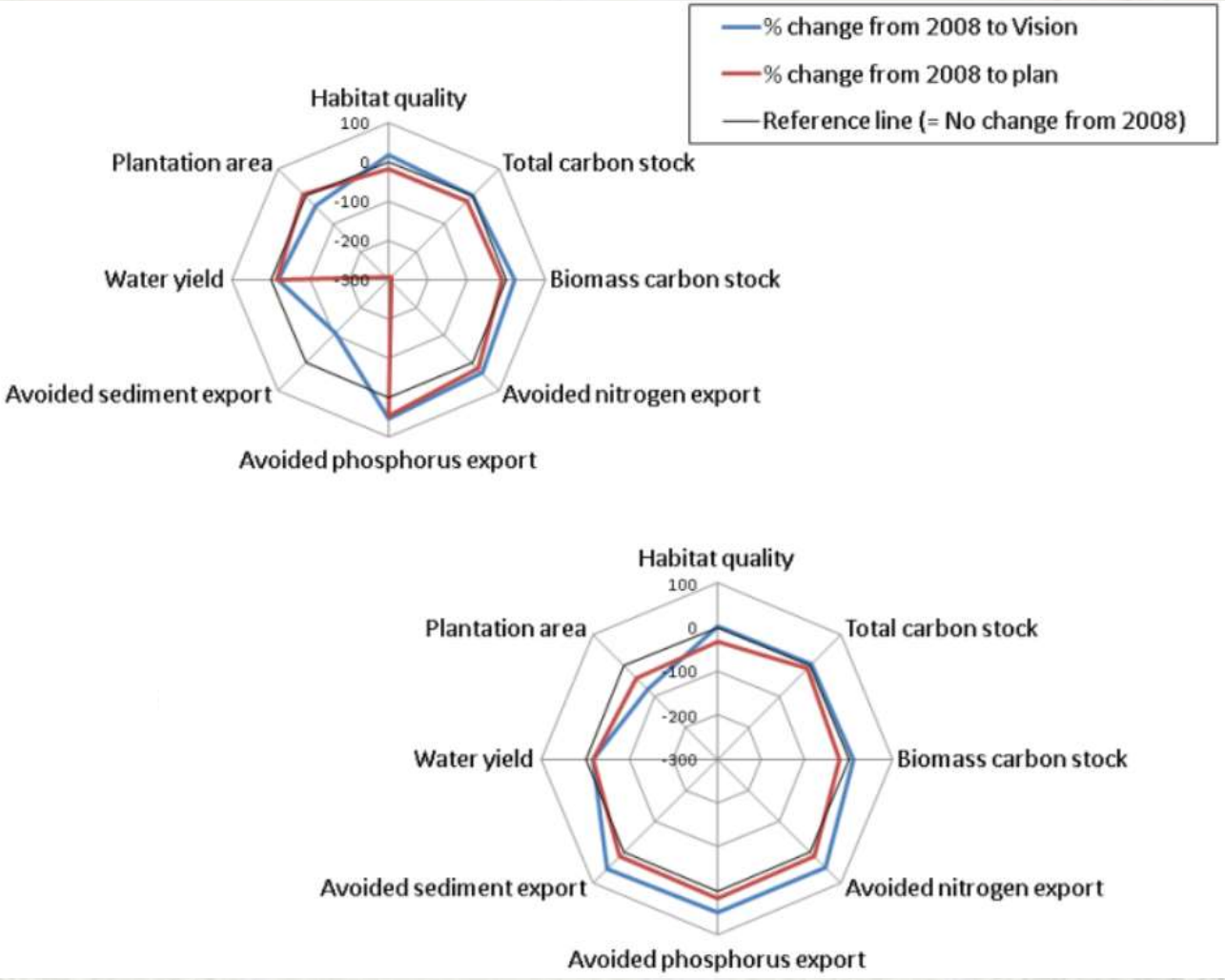
Changes in tiger habitat (extent) and ecosystem services (percent change within each sub-watershed) from 2008 to the two scenarios.


COASTAL VULNERABILITY
Vulnerability by Coastal Planning Region
Northern Region
Ambergris Caye
Caye Caulker
Central Region
Turneffe Atoll
Lighthouse Reef Atoll
South Northern R
South Central R
Southern R
SCENARIOS
Current
Conservation
Lowest
Medium
Highest
INFORMED MANAGEMENT


Annual Number of Visitors
< 1,000
1,000 to 8,000
8,000 to 56,000
RECREATION
Percent Visitation to Belize by Coastal Planning Region
Northern Region
Ambergris Caye
Caye Caulker
Central Region
Turneffe Atoll
Lighthouse Reef Atoll
South Northern Region
South Central Region
Southern Region
SCENARIOS
Current
Conservation
Informed Management
Development
INFORMED MANAGEMENT


LOBSTER FISHERIES
Thousands of Pounds
0
83
137
177
248
416
and Catch by Coastal Planning Region
(Millions of
(Thousands of Pounds)
$3.0
$2.0
$1.0
$0.0
SCENARIOS
Current
Conservation
Informed Management
Development
INFORMED MANAGEMENT

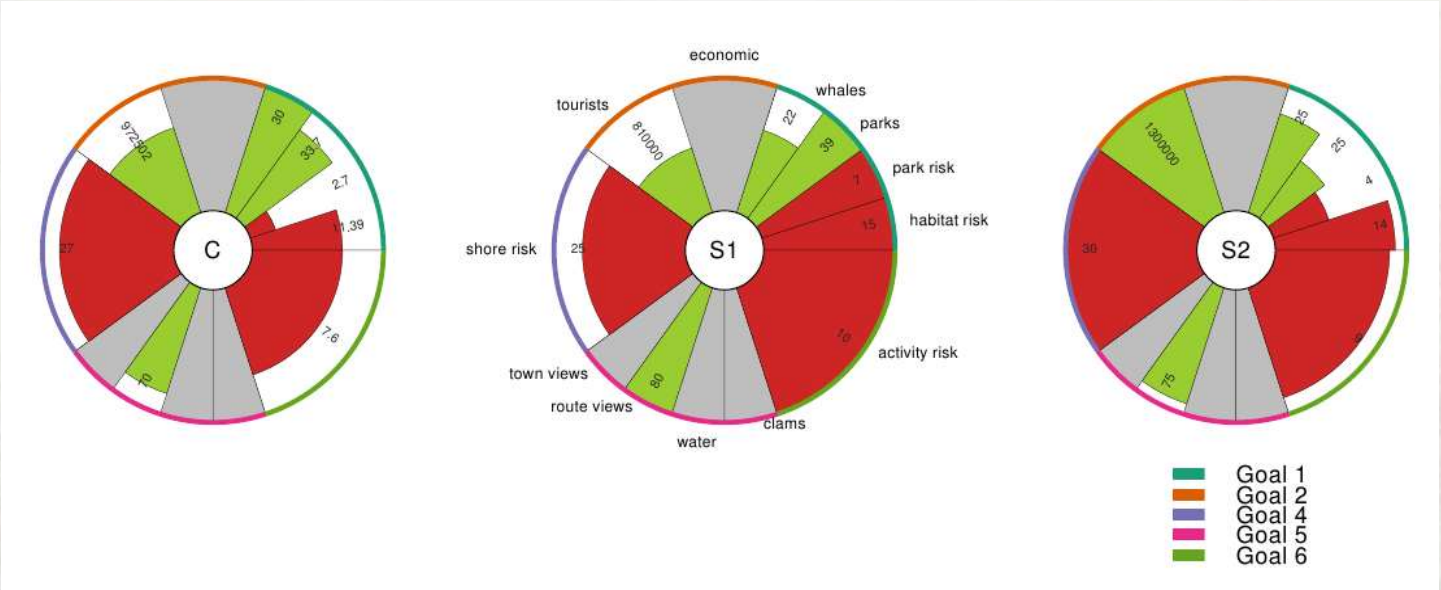

FUNCTIONAL HABITAT (km²)
2010
2025
CURRENT
CONSERVATION
INFORMED MANAGEMENT
DEVELOPMENT
CORALS
MANGROVES
SEAGRASSES
1500
1000
500
0
135
285
851
184
391
1240
159
368
1044
18
158
55
LOBSTER FISHERIES
LOW
HIGH
CATCH (thsd. pounds) 519 764 676 79
REVENUE (mil. BZ$) 16 24 21 3
RECREATION
LOW
HIGH
VISTORS (# in mil.) 1.8 4.2 4.9 4.2
EXPENDITURES (mil. BZ$) 205 446 834 444
COASTAL PROTECTION
LOW
HIGH
LAND PROTECTED (km²) 351 387 379 196
AVOIDED DAMAGES (bil. BZ$) 3.6 4.4 7.6 4.1

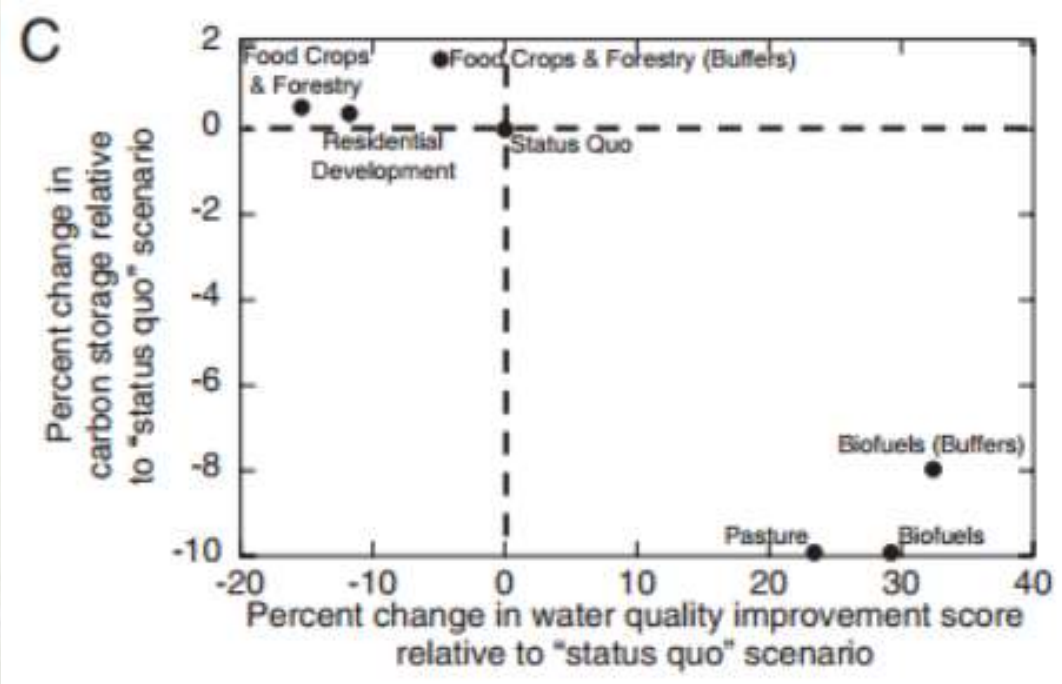

% change from 2008 to Vision
% change from 2008 to plan
Reference line (= No change from 2008)
Habitat quality
100
0
-100
-200
-300
Total carbon stock
Biomass carbon stock
Avoided nitrogen export
Avoided phosphorus export
Avoided sediment export
Water yield
Plantation area
Habitat quality
100
0
-100
-200
-300
Total carbon stock
Biomass carbon stock
Avoided nitrogen export
Avoided phosphorus export
Avoided sediment export
Water yield
Plantation area

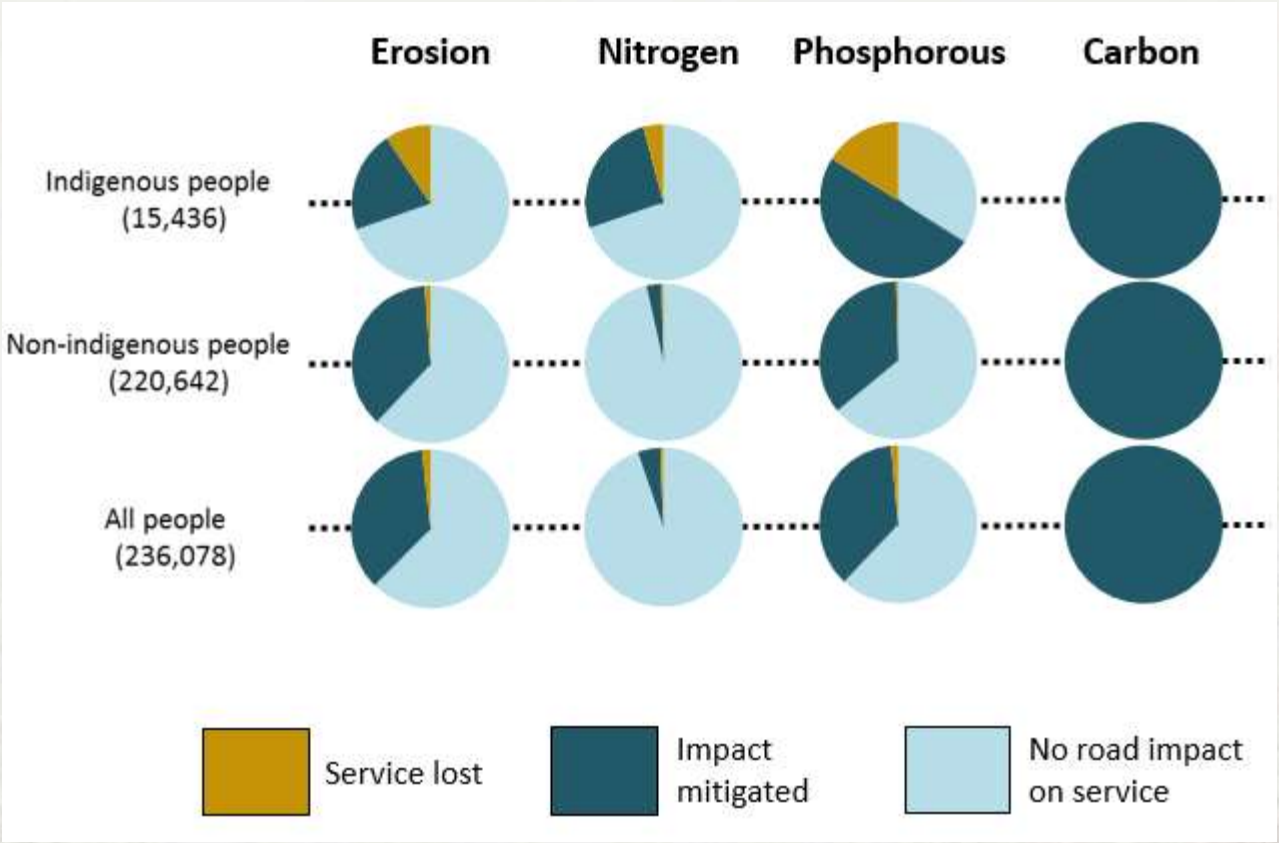
current

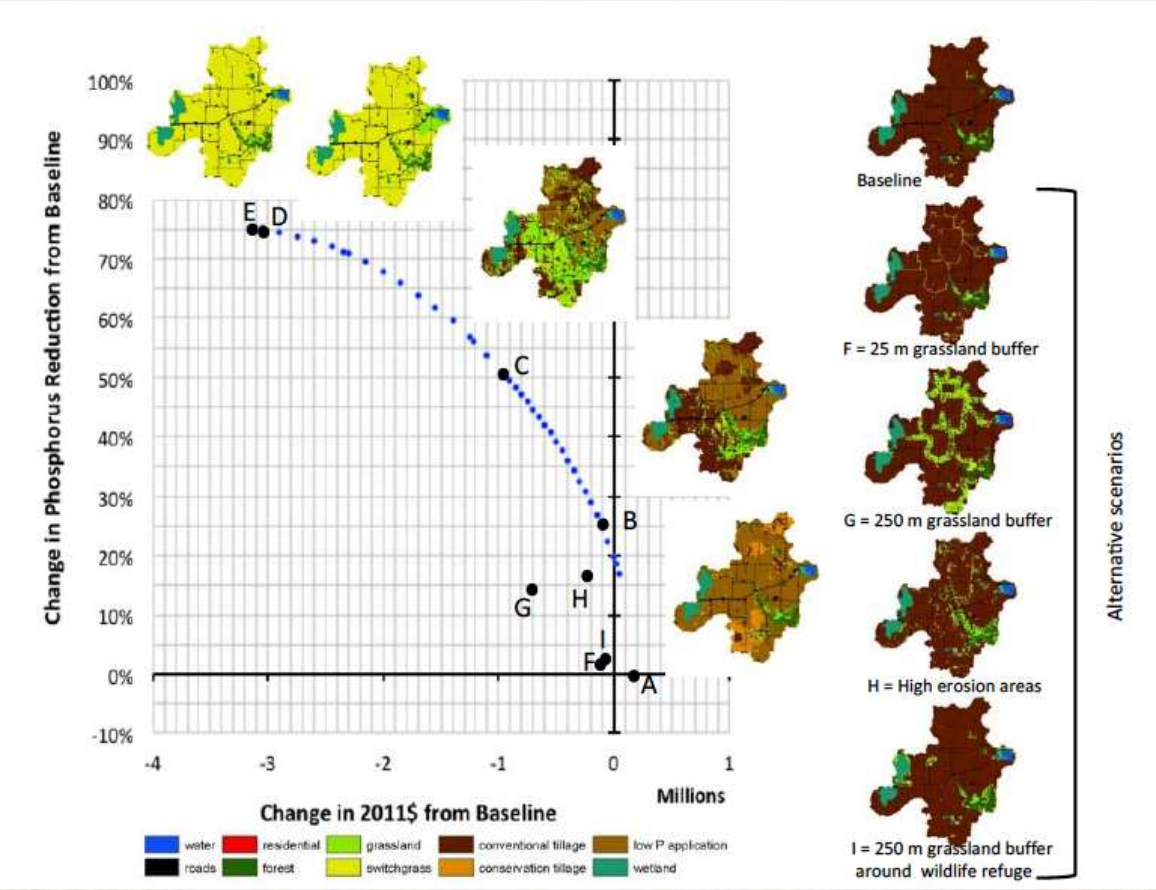
scenario 1

scenario 2




C
Food Crops & Forestry
Food Crops & Forestry (Buffers)
Residential Development
Status Quo
Biofuels (Buffers)
Pasture
Biofuels
Percent change in carbon storage relative to "status quo" scenario
Percent change in water quality improvement score relative to "status quo" scenario
2
0
-2
-4
-6
-8
-10
-20
-10
0
10
20
30
40


Erosion
Nitrogen
Phosphorous
Carbon
Indigenous people (15,436)
Non-indigenous people (220,642)
All people (236,078)
Service lost
Impact mitigated
No road impact on service


Change in Phosphorus Reduction from Baseline
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
-10%
-4
-3
-2
-1
0
1
Millions
Change in 2011$ from Baseline
E
D
C
B
G
H
I
F
A
water
residential
grassland
conventional tillage
low P application
roads
forest
switchgrass
conservation tillage
wetland
Baseline
F = 25 m grassland buffer
G = 250 m grassland buffer
H = High erosion areas
I = 250 m grassland buffer around wildlife refuge
Alternative scenarios

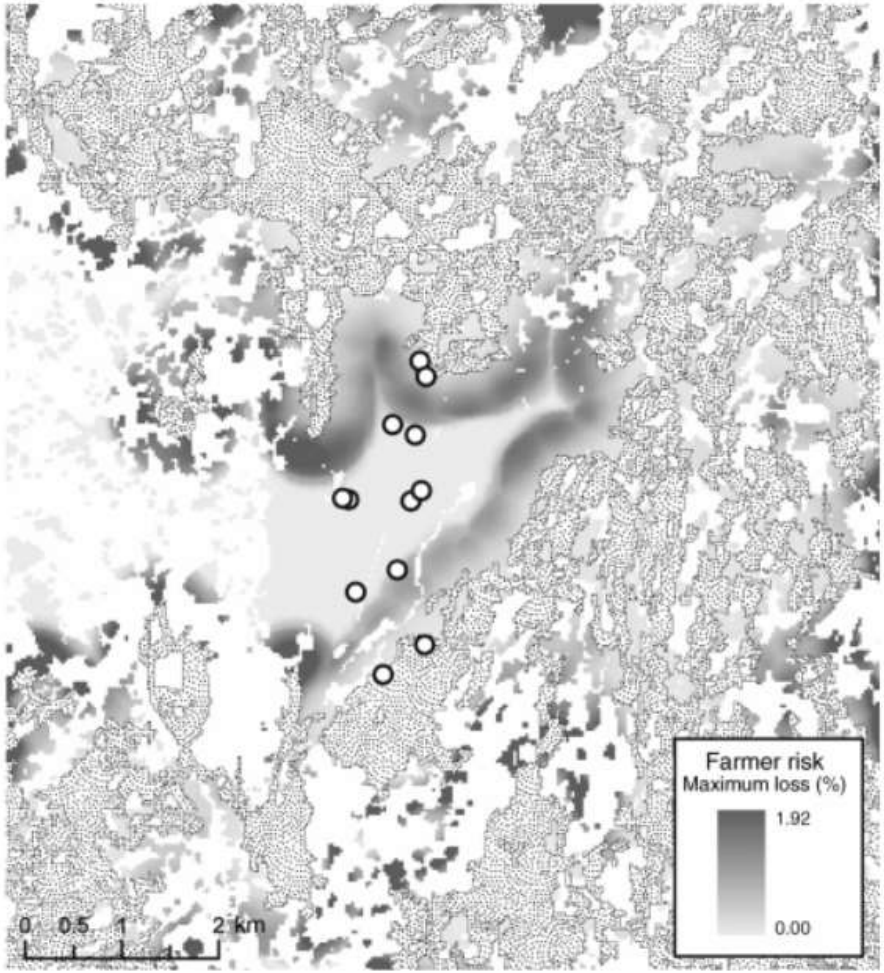
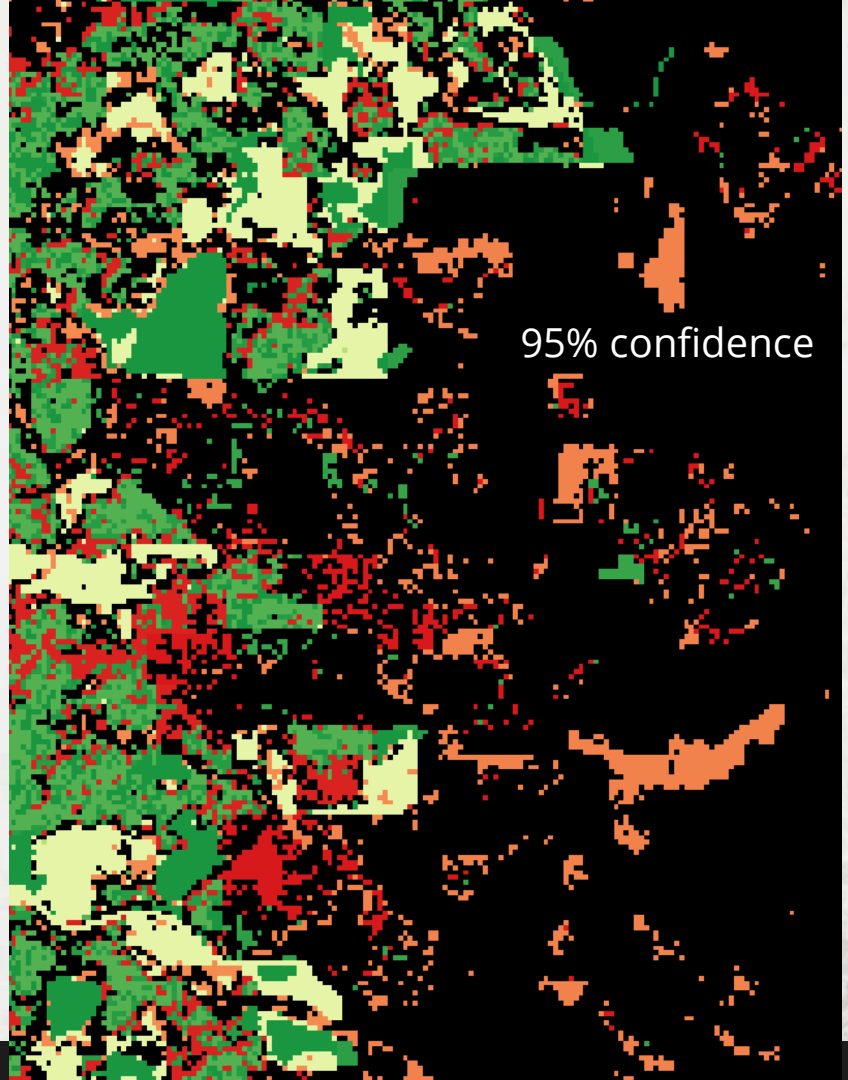


FIG. 7. Risk to coffee farmers from marginal changes in pollination services due to deforestation. The map displays the maximum percentage change in coffee production from all simulated deforestation events (0.81 ha [3 × 3 parcel block] at a time). Forest patches are stippled for reference. All other land classes besides coffee are left white.

carbon sequestration with uncertainty



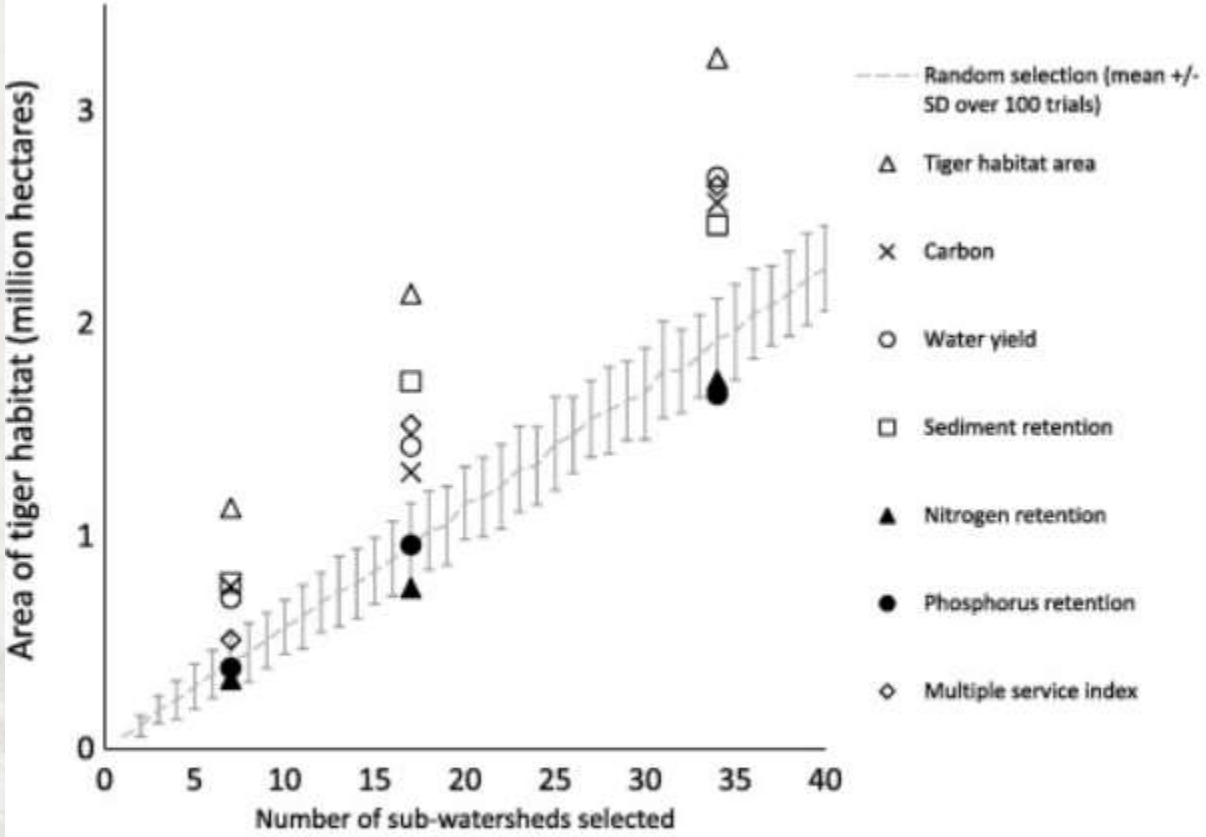


Fig. 5.

Coverage of tiger habitat in 2008 obtained by selecting the top 10%, 25% and 50% of sub-watersheds (n = 7, 17 and 34 respectively) based on area of tiger habitat, ecosystem service amount, or random selection.