Vulnerability of Michigan Wildlife to Climate Change

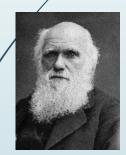
Christopher L. Hoving

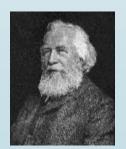
October 7, 2016

Michigan SAF Meeting, Gaylord, Michigan

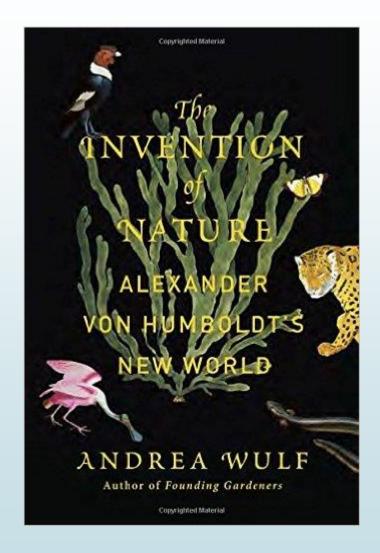


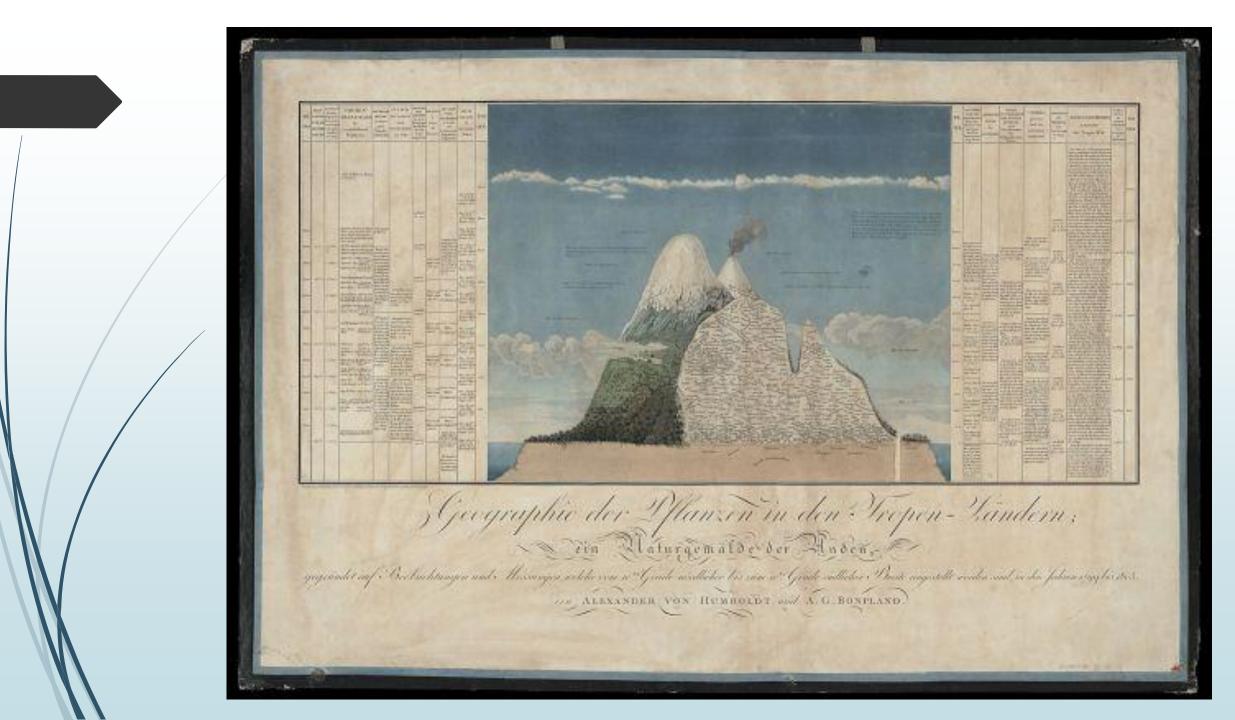












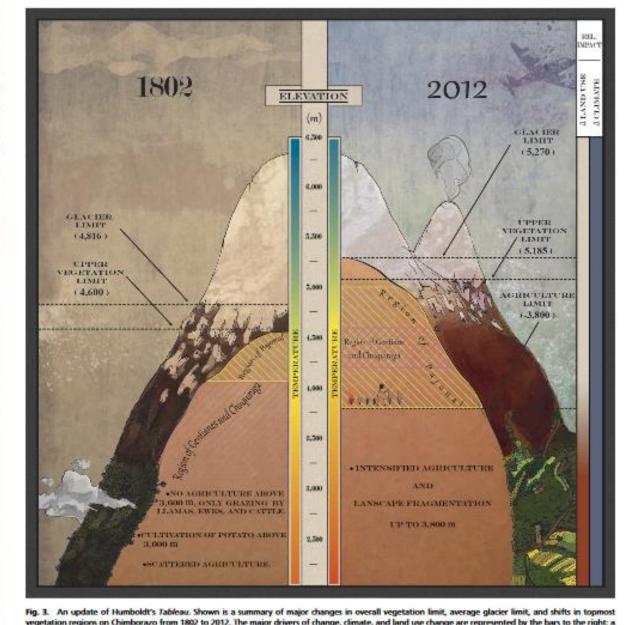


Fig. 3. An update of Humboldt's Tableau. Shown is a summary of major changes in overall vegetation limit, average glacier limit, and shifts in topmost vegetation regions on Chimborazo from 1802 to 2012. The major drivers of change, climate, and land use change are represented by the bars to the right: a constant impact of climate change—in particular, increased temperature—the stronger relative impact of land use at the lower sites, mainly through intensified agriculture, and the effect of grass harvesting and local burning. Illustration of glaciers is approximate.

Morueta-Holme, N., K. Engemann, P. Sandoval-Acuna, J.D. Jonas, R.M. Segnitz, J. Svenning. 2015. Strong upslope shifts in Chimborazo's vegetation over two centuries since Humboldt. PNAS 112: 12741-12745

Species, Populations, Individuals

- Species shift by
 - Population increase or decrease
 - Increasing populations cause more dispersal events
 - Success or failure of dispersing individuals
- How vulnerable are Michigan wildlife?
- Are there patterns or groups that are more vulnerable?

NatureServe CCVI

Joint project of the Michigan DNR and Michigan Natural Features Inventory

- With funding by:
 - The Michigan Department of Environmental Quality (DEQ) Coastal Zone Management program
 - Michigan DNR Wildlife Division funds from State Wildlife Grants and Pittman-Robertson.

NatureServe CCVI 2.0

- Ranks species by exposure and sensitivity to climate change
- Any plant or animal species, terrestrial or aquatic
- Easy and (relatively) quick
 - Microsoft Excel spreadsheet
 - 2-5 days training, ~30 species/day

Caveats

Preliminary assessment

■ Expect surprises

Vulnerability of migratory species problematic

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Results

- 17% of game species vulnerable
- 61% of SGCN vulnerable

- Under-estimates vulnerability of migratory species
- ► Full report online at:

http://www.michigan.gov/documents/dnr/3564 Climate Vulnerability Division Report 4.24.13 418644 7.pdf

Turkey

- CCVI Increase Likely & Expand Range in Michigan (mid-century)
- Audubon 87% loss of winter range by 2080 rangewide (late century)
 - Loss in SLP, Stronghold in West UP



Ruffed Grouse



- CCVI Presumed Stable & Range Shift out of Michigan (mid-century)
- Audubon 34% loss of winter range by 2080 range-wide (late century)
 - Extirpated from Michigan
- Zuckerman et al. Persists as long as young aspen persists, but no population cycles

Eastern Massasauga Rattlesnake



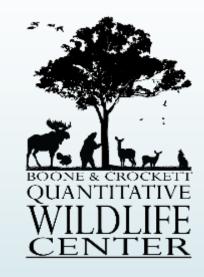
- CCVI Highly Vulnerable (mid century)
- Severe declines in SLP, especially SW (late century)
 - Pomara et al. 2014

The big picture

- Species respond individually, not as communities
- Monitor, especially boreal species
- Foster diversity to keep your options open
- Focus on opportunities

Acknowledgements

Michigan Natural Features Inventory DEQ Coastal Zone Management Yu Man Lee Peter J. Badra Brian J. Klatt David Cuthrell









Questions and Contact

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