

Disentangling Distant Impacts of US Midwestern Drought on Land Change in the Brazilian Cerrado

Prospective Talk

Nicholas Manning
Department of Fisheries & Wildlife
Center for Systems Integration & Sustainability
Michigan State University

Today we'll discuss...

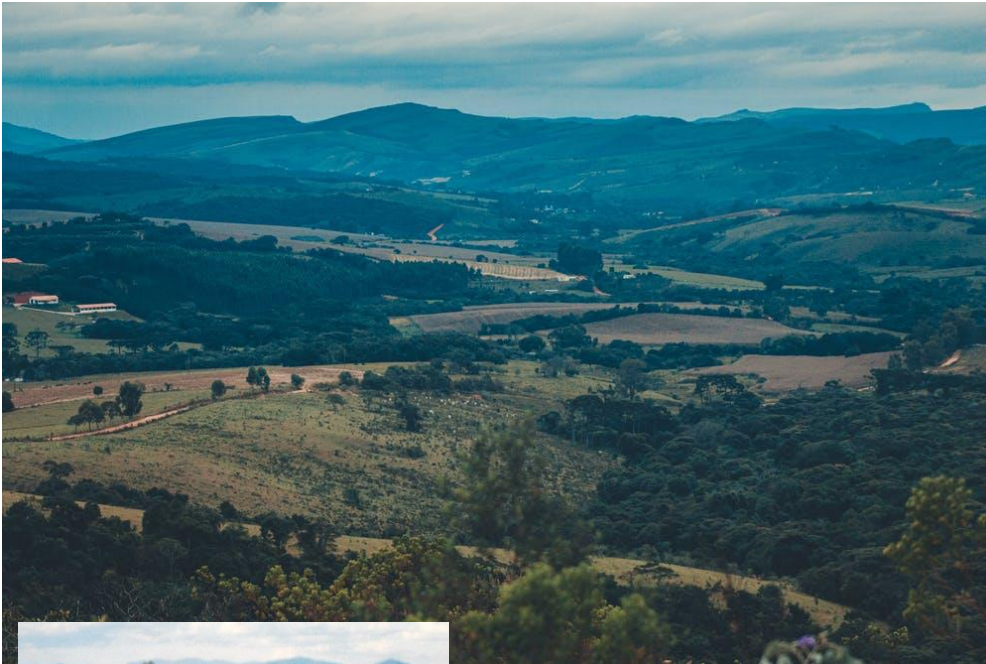


1) Systems and threats

2) Link & consequence of distant disasters

3) Our approach to measure impact

Cerrado



Giant Anteater



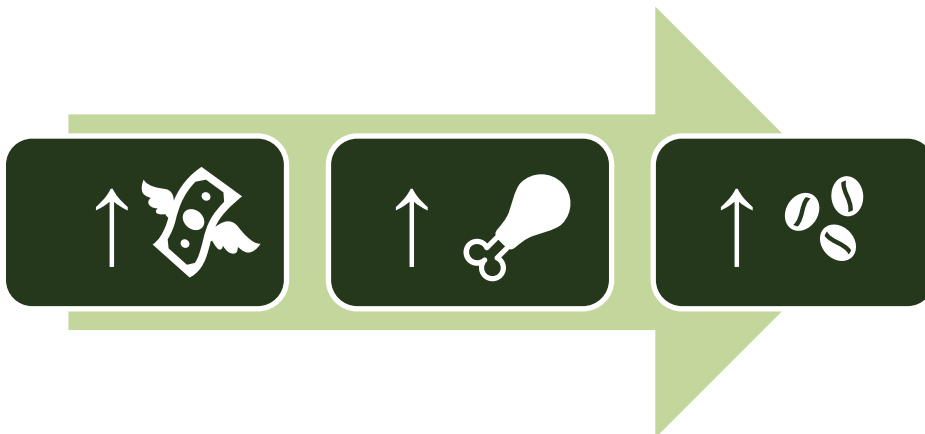
Giant Armadillo



Greater Rhea

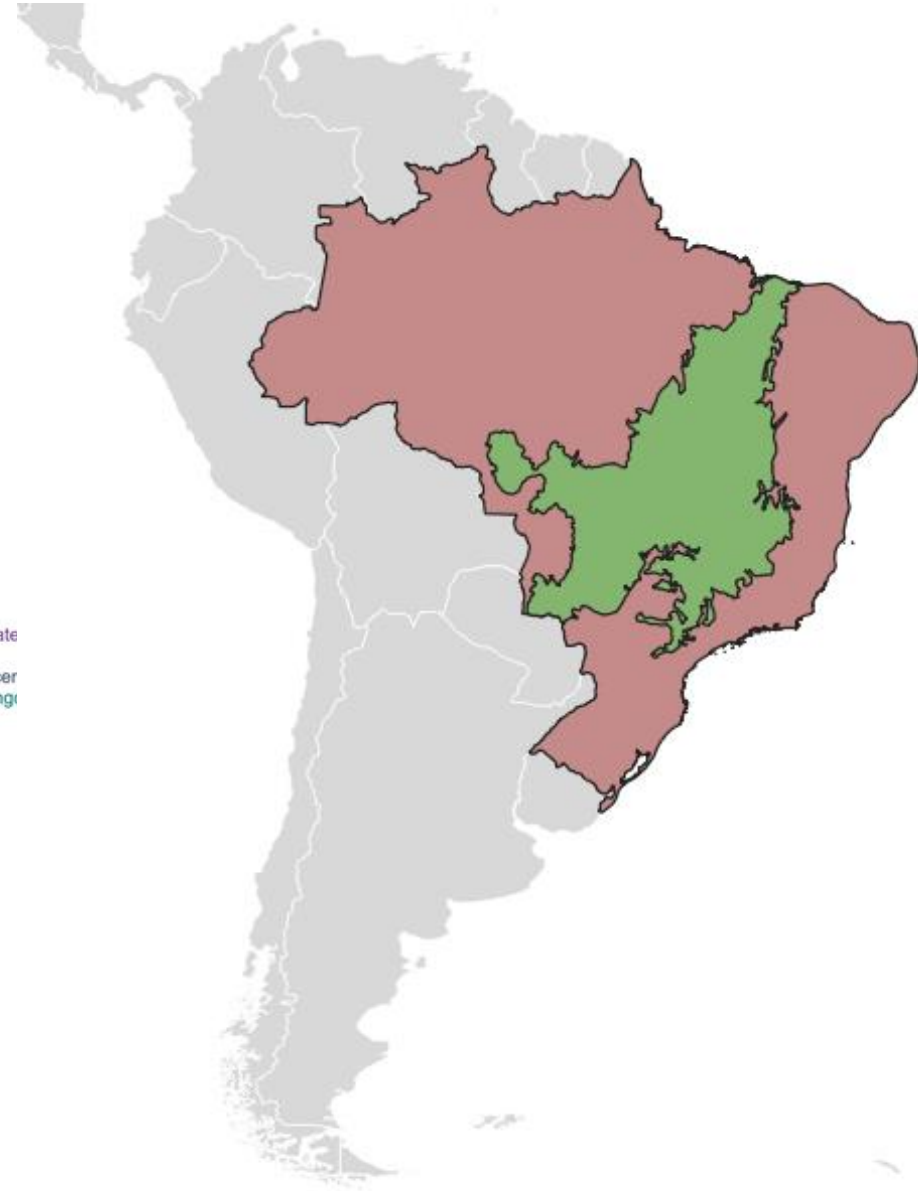
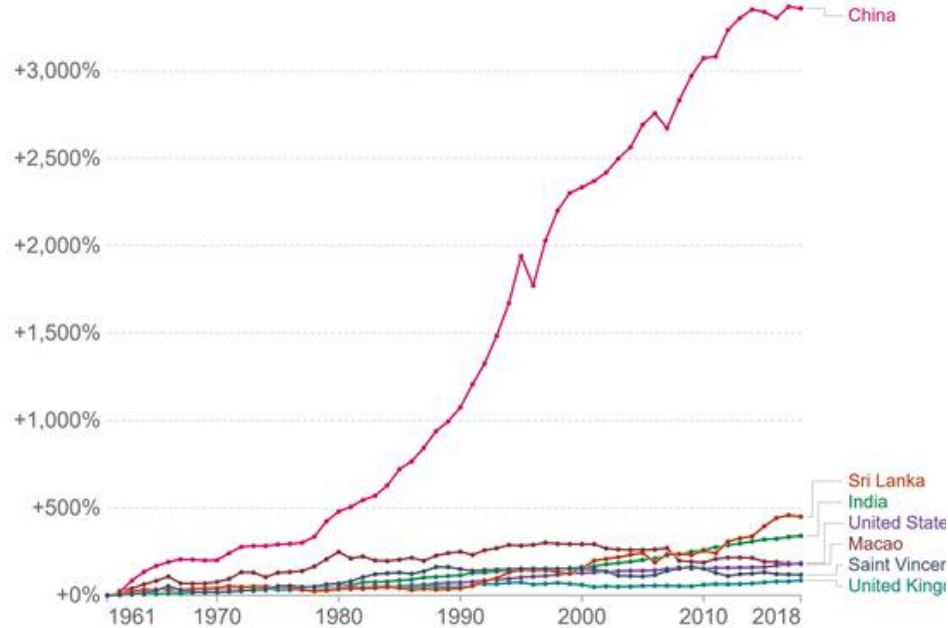
* Image Sources:
 Anteater: <http://allthematters.com/biology/fauna-and-flora/>
 Armadillo: <https://whiteyaward.org/winners/conservation-of-giant-armadillos-in-the-cerrado-brazil/>
 Rhea: <https://www.infoescola.com/aves/ema/>

Cerrado



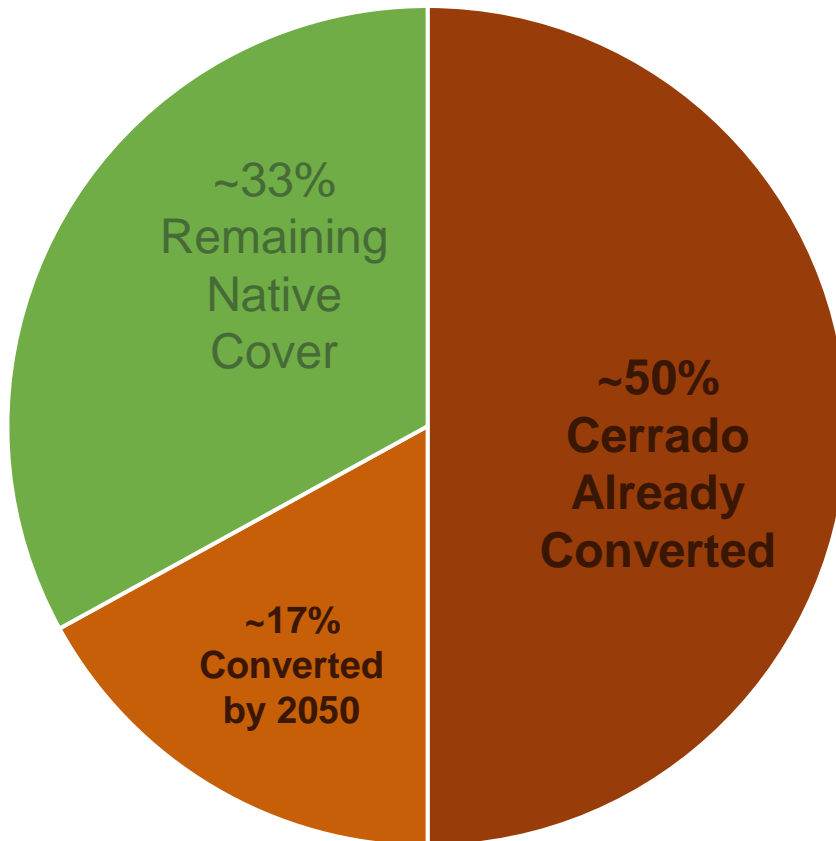
Change in meat production, 1961 to 2018

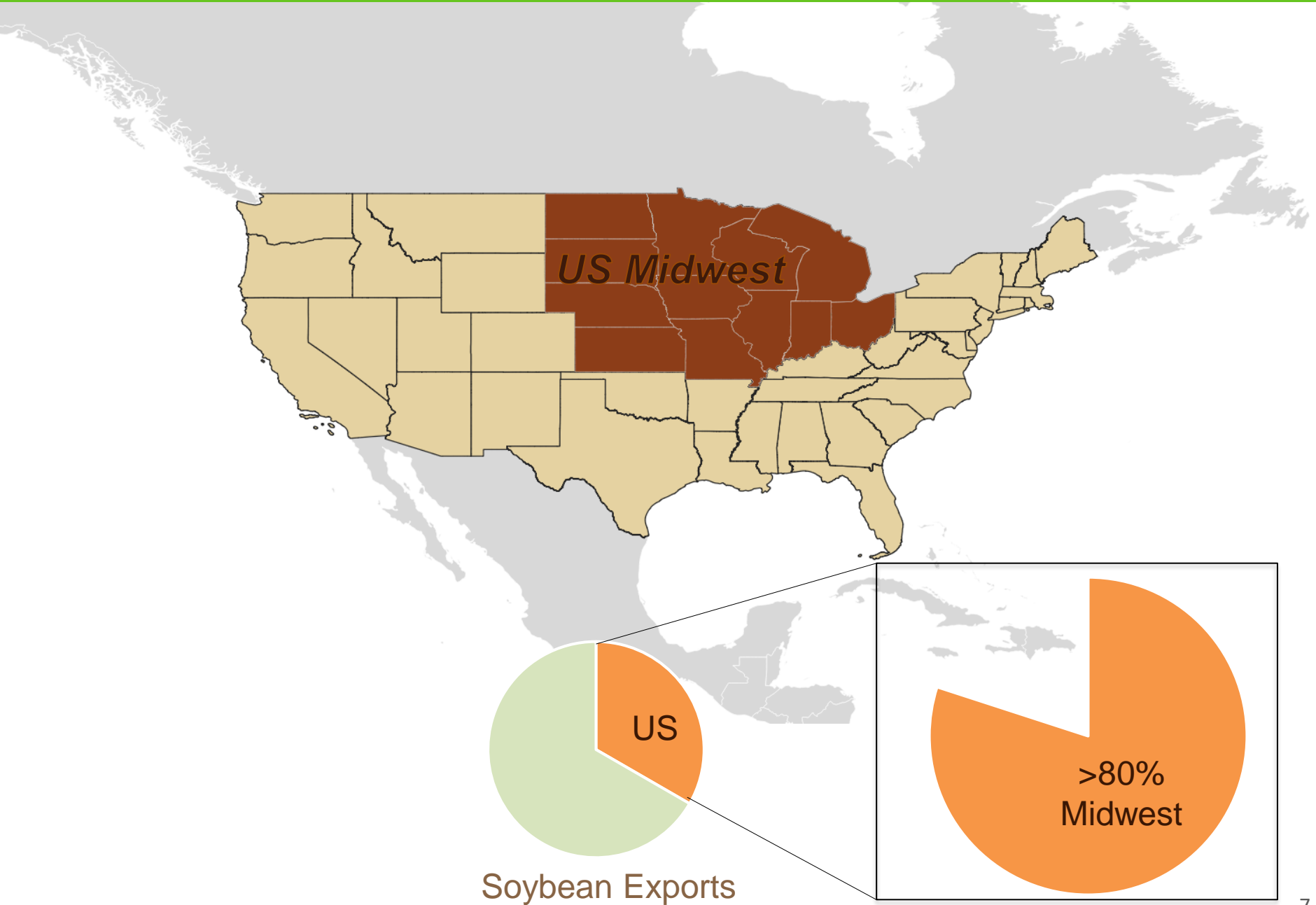
Meat includes cattle, poultry, sheep/mutton, goat, pigmeat, and wild game.

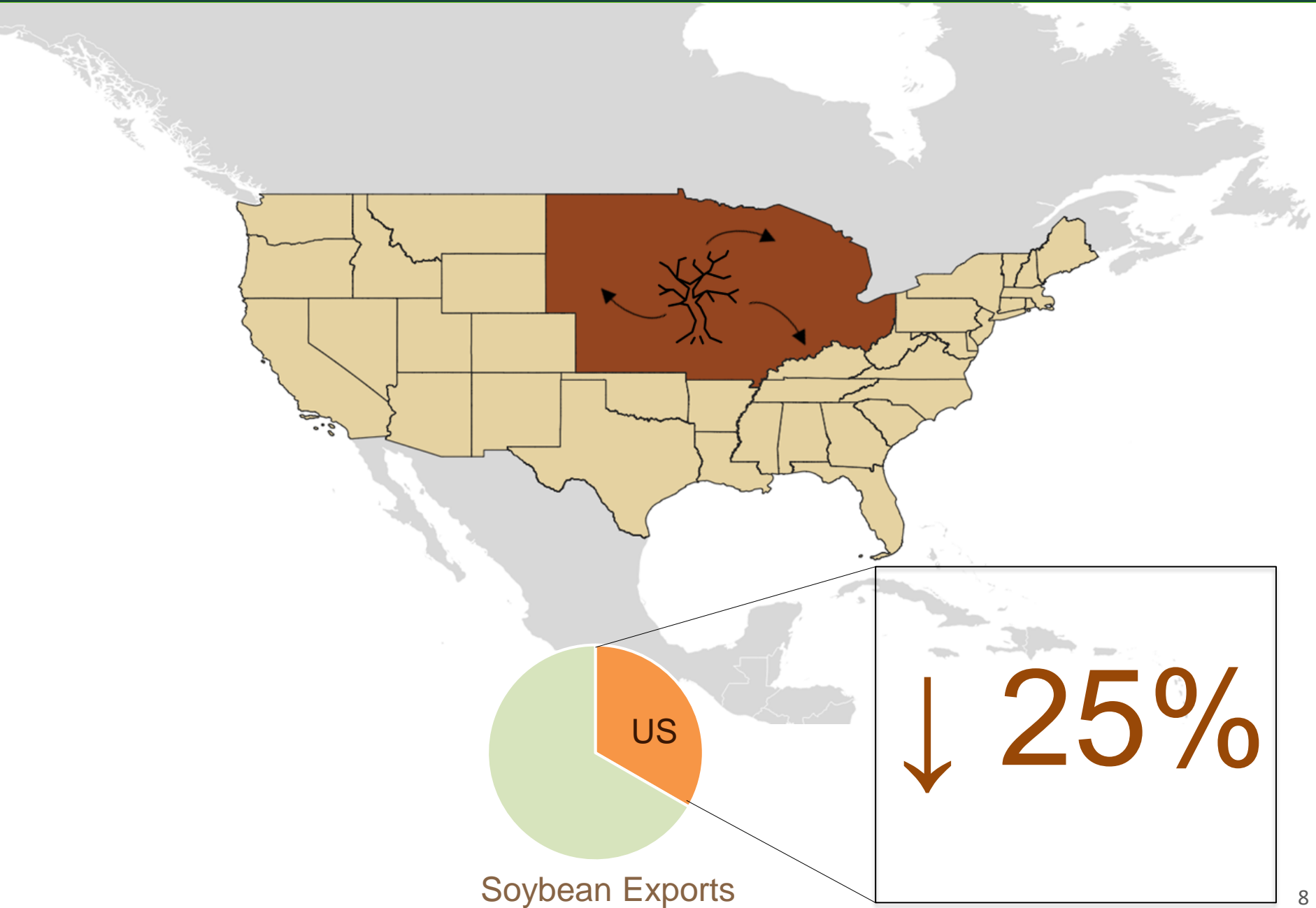


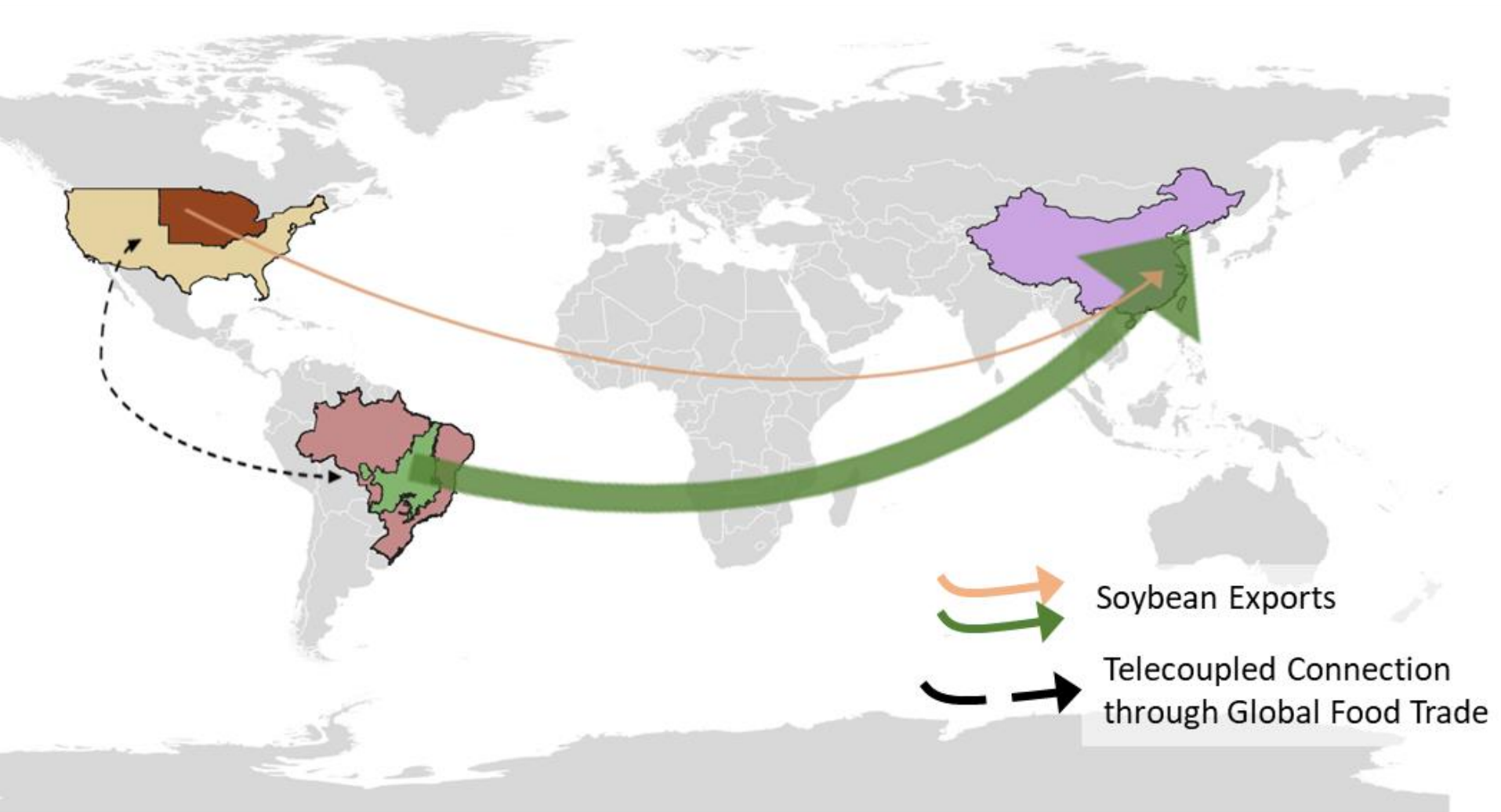
↑ 3000% CN Meat Production

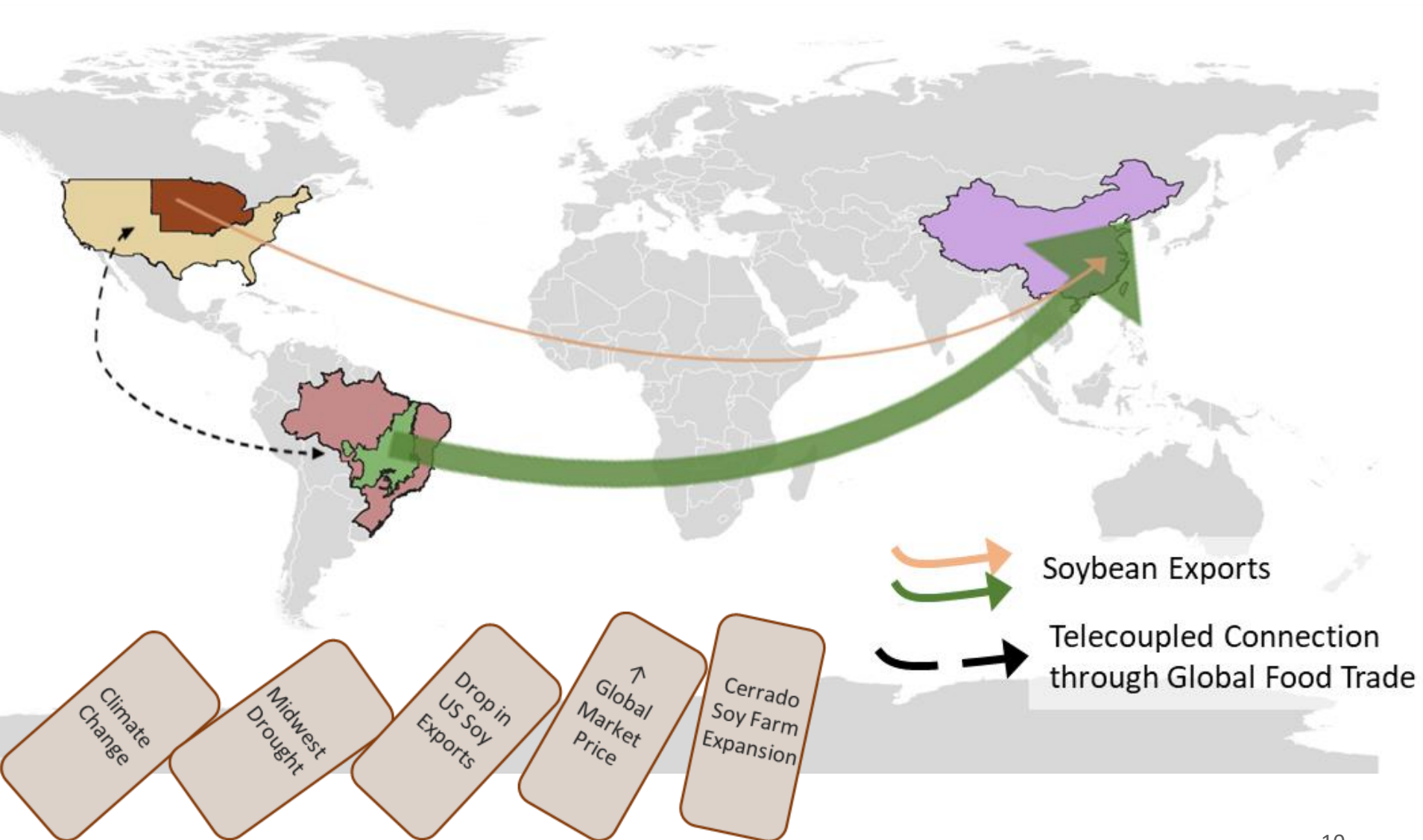
↑ 2000% BR-CN Exports







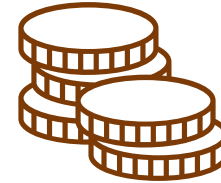
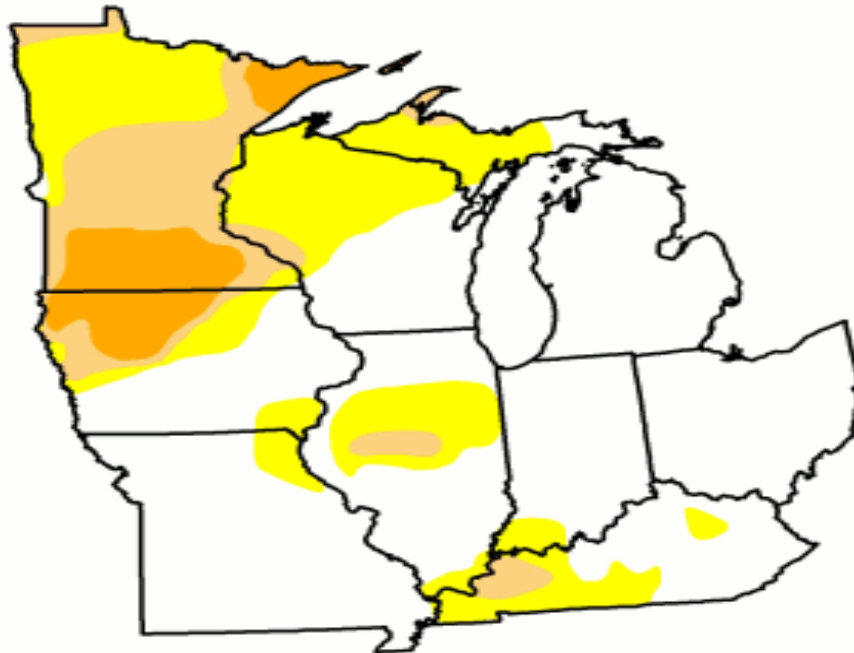




US Midwest Drought of 2012

April 17, 2012

Valid 7 a.m. EST



\$36,0000,000,000

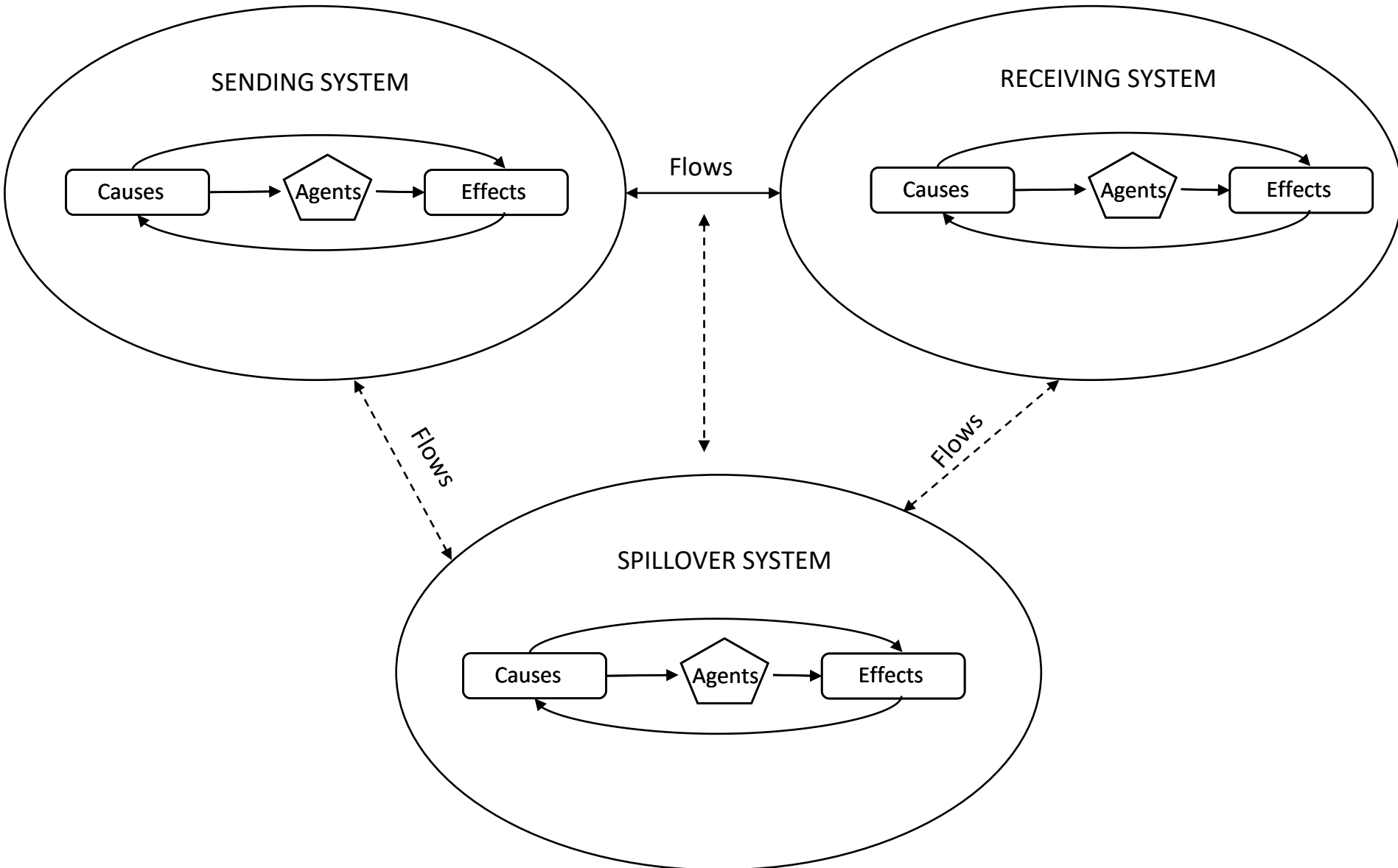


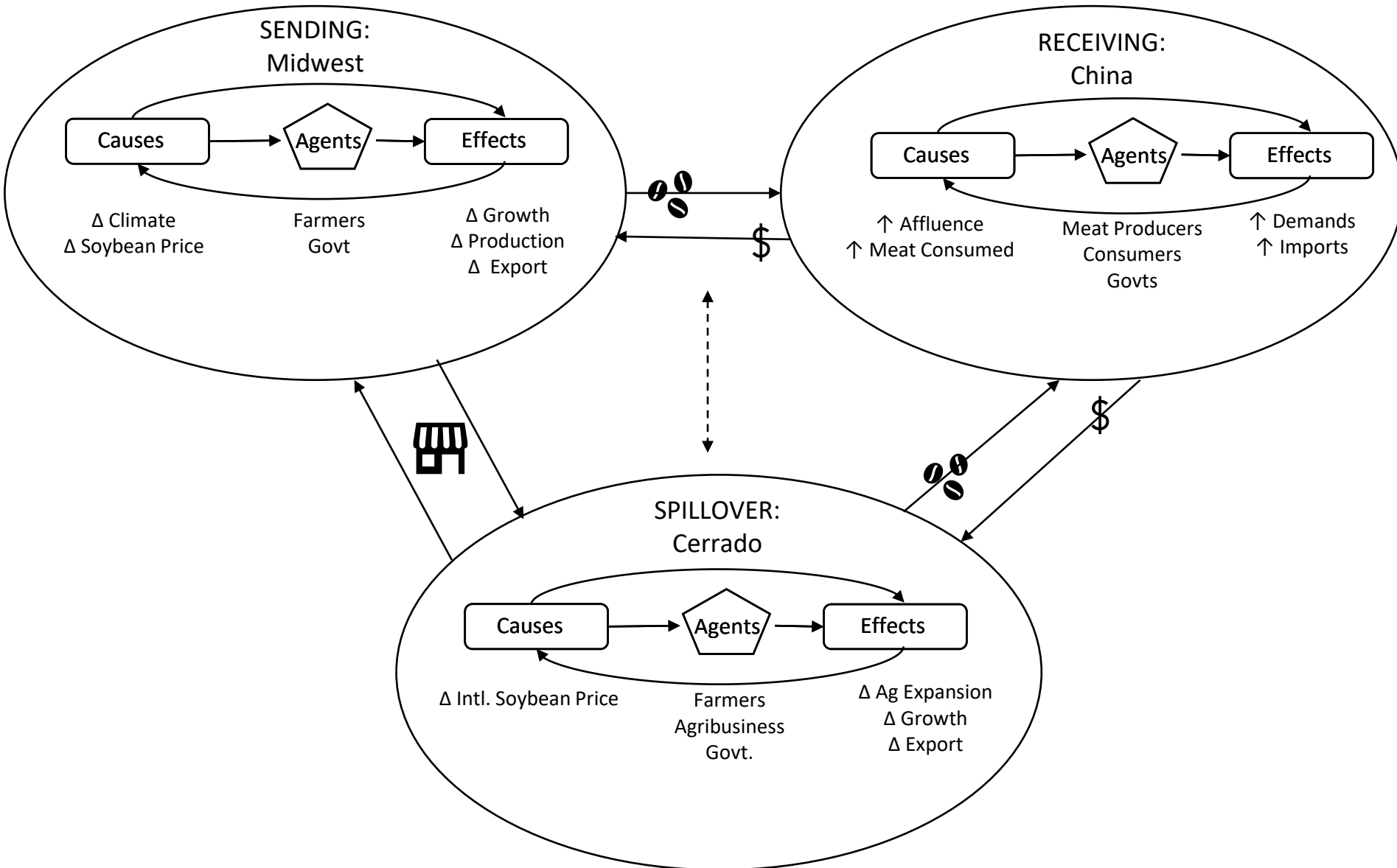
88%



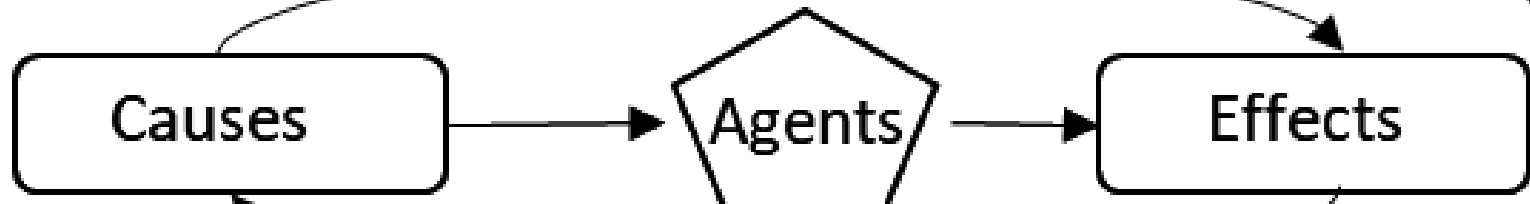
Released Thursday, April 19, 2012

Anthony Artusa, Climate Prediction Center/NCEP/NWS/NOAA





RECEIVING: China



↑ Affluence
↑ Meat Consumed

Meat Producers
Consumers
Govts

↑ Demands
↑ Imports

SENDING: Midwest

Causes

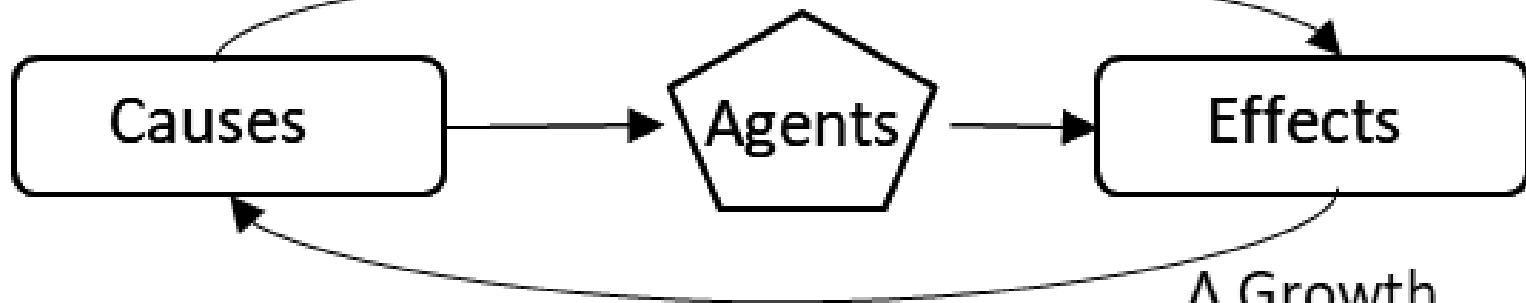
Agents

Effects

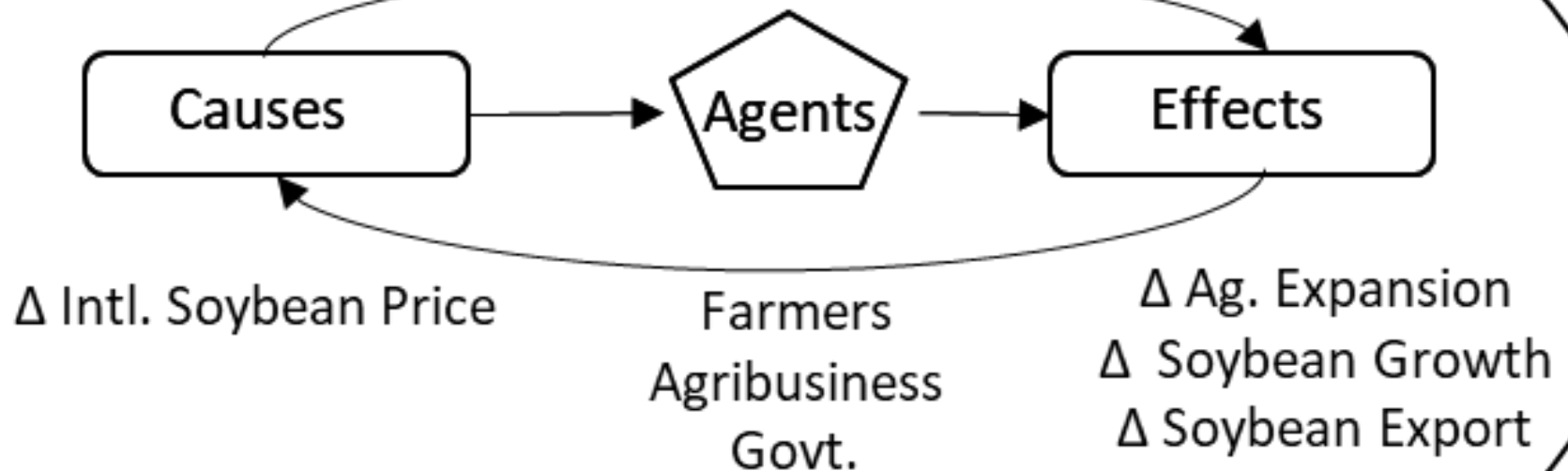
Δ Climate Conditions
Δ Intl Soybean Price

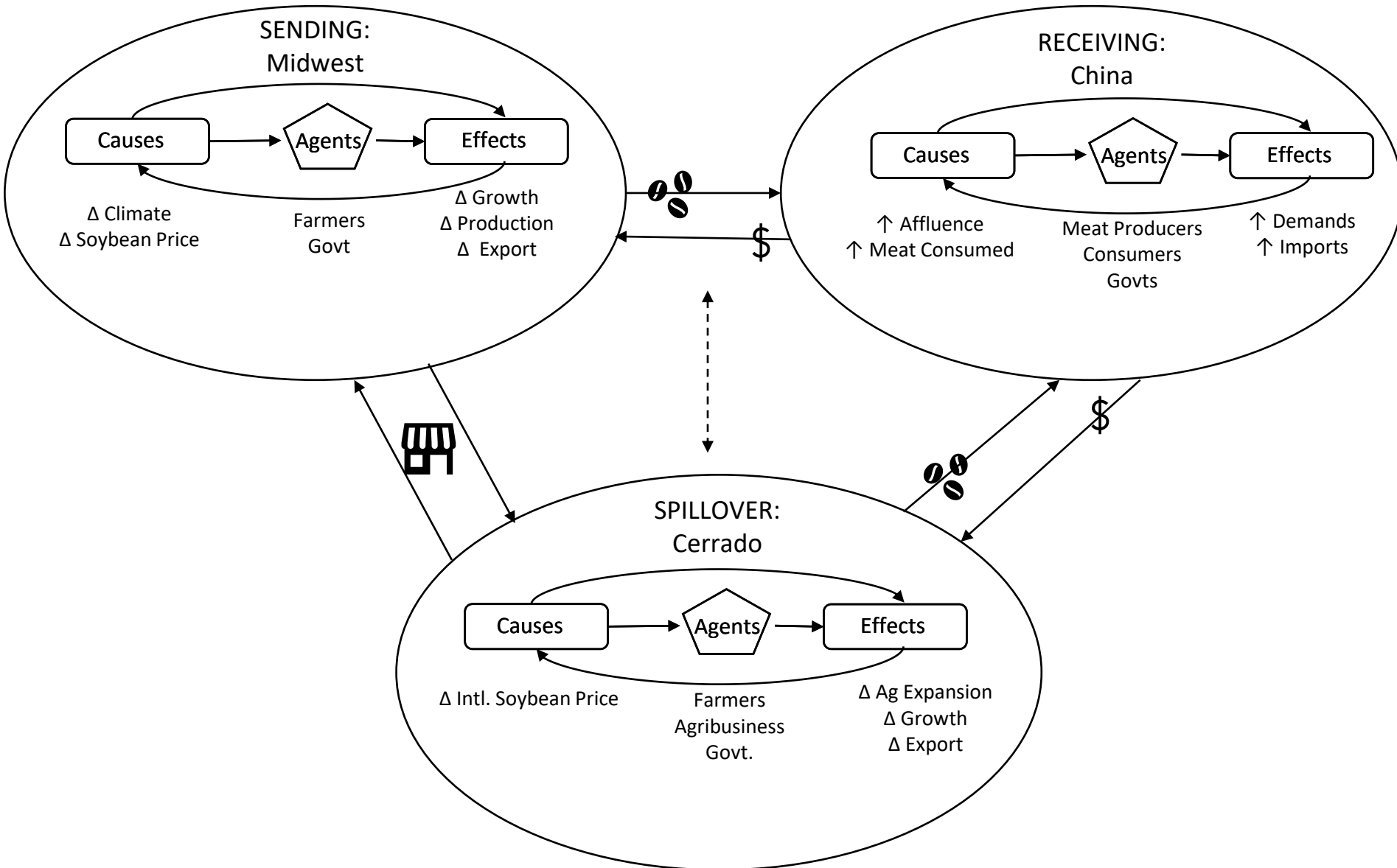
Farmers
Govt

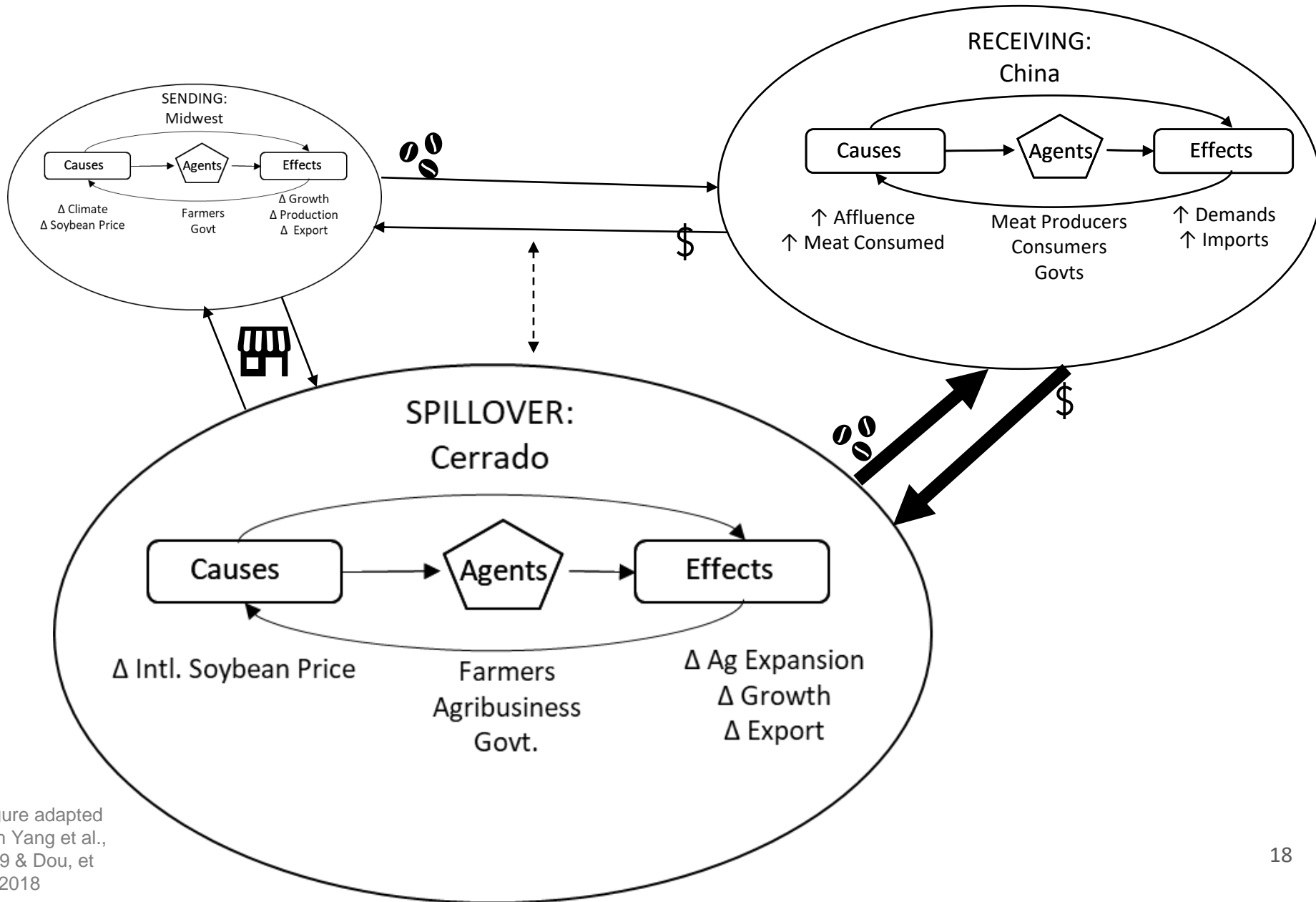
Δ Growth
Δ Production
Δ Export



SPILOVER: Cerrado







1

Gather & Analyze
Drought, Yield, &
Price Data

2

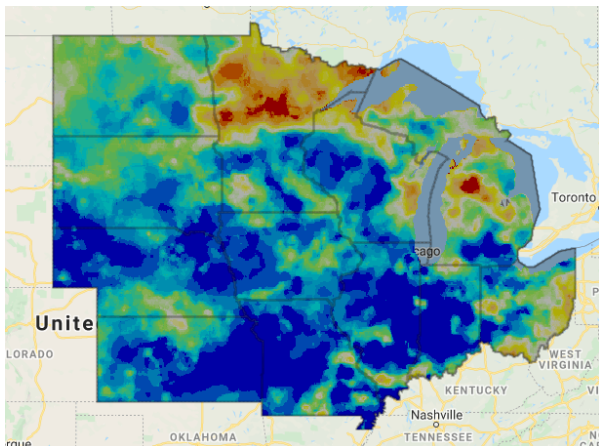
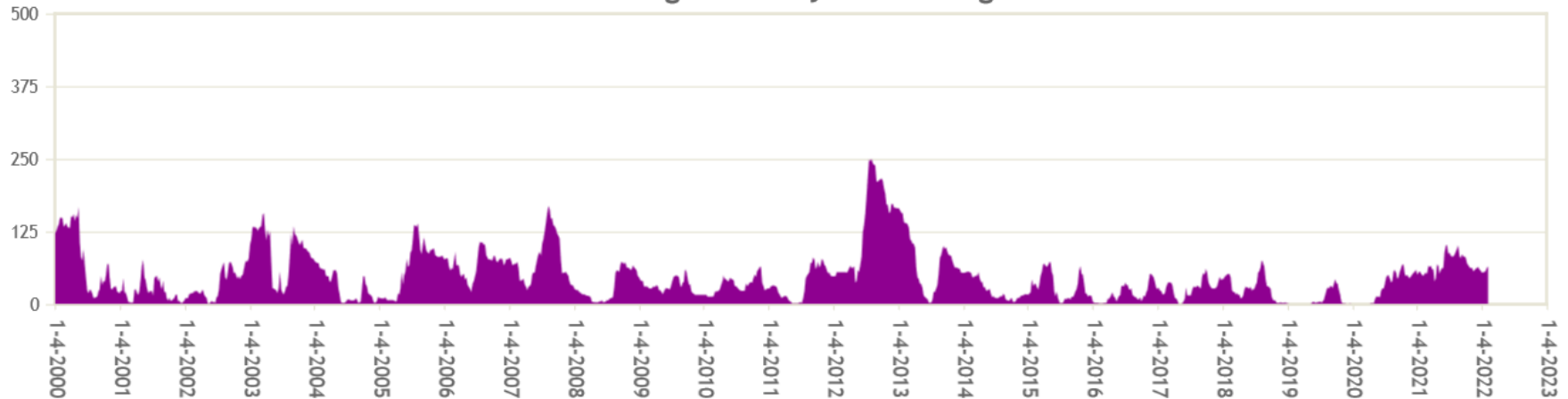
Determine Land
Change Rates in the
Cerrado

3

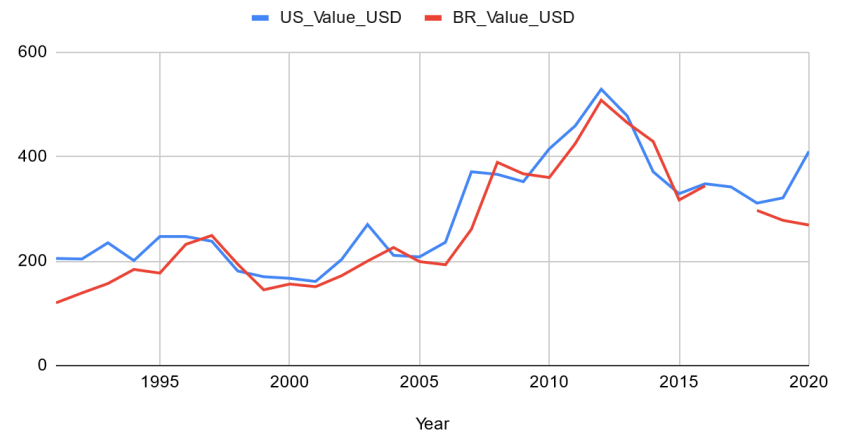
Develop Models to
Measure Impact of
Midwest Drought
on Cerrado Land
Change

1) Gather & Analyze Drought, Yield, & Price Data

Midwest Drought Severity and Coverage Index



Soybean Prices in USD



2) Determine Land Change Rates in the Cerrado



Web
Platform

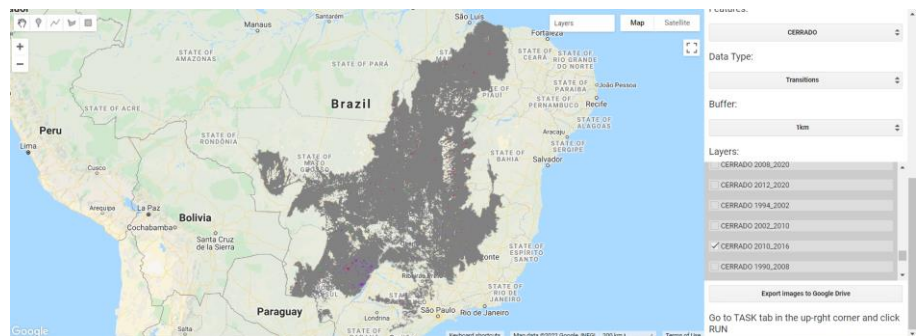


Excel

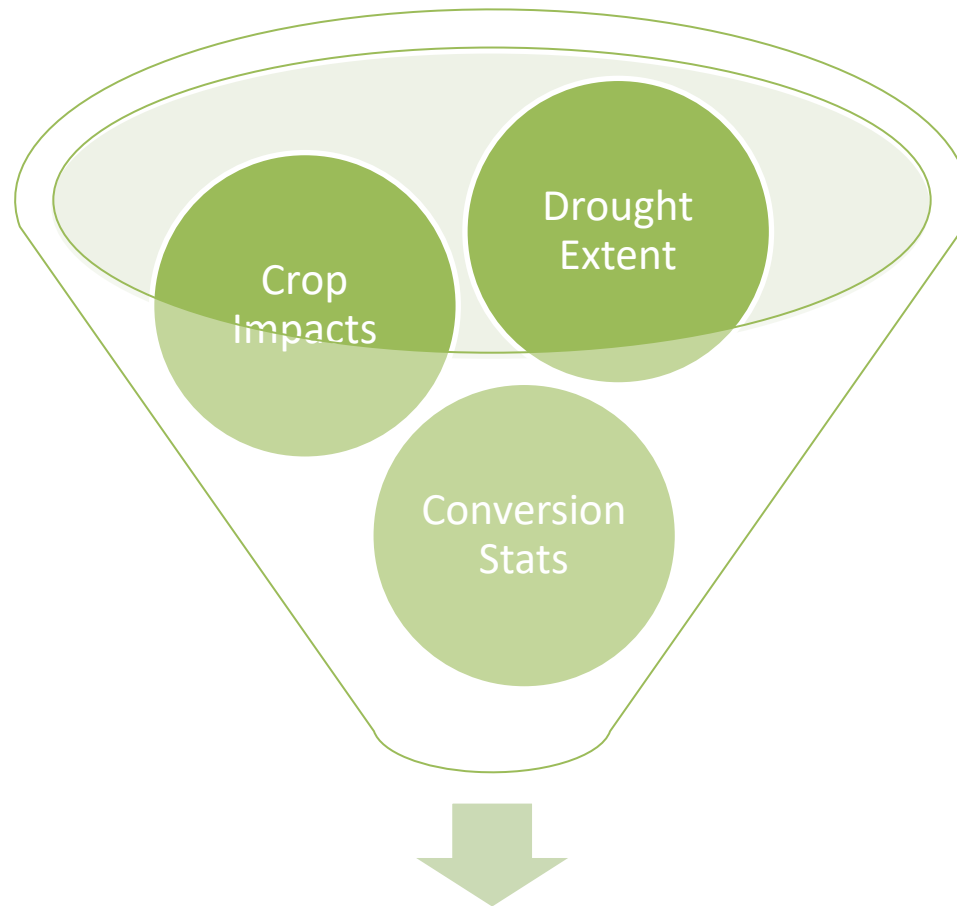
state	biome	Soma de 1985-2020	Column Labels	3. Farming	4. Non Vegetated Area	5. Water	5. Water Total	Grand Total
BAHIA	AMAZÔNIA							
DISTRITO FEDERAL	CAATINGA							
GOIÁS	CERRADO							
MARANHÃO	MATA ATLÂNTICA							
MATO GROSSO	PAMPA							
MATO GROSSO DO ...	PANTANAL							
MINAS GERAIS								
PARÁ								
PARANÁ								
PIAUÍ								
RONDÔNIA								
SÃO PAULO								
TOCANTINS								
ACRE								
ALAGOAS								
AMAPÁ								
AMAZONAS								
CEARÁ								



GEE



3) Develop Models to Measure Impact of Midwest Drought on Cerrado Land Change

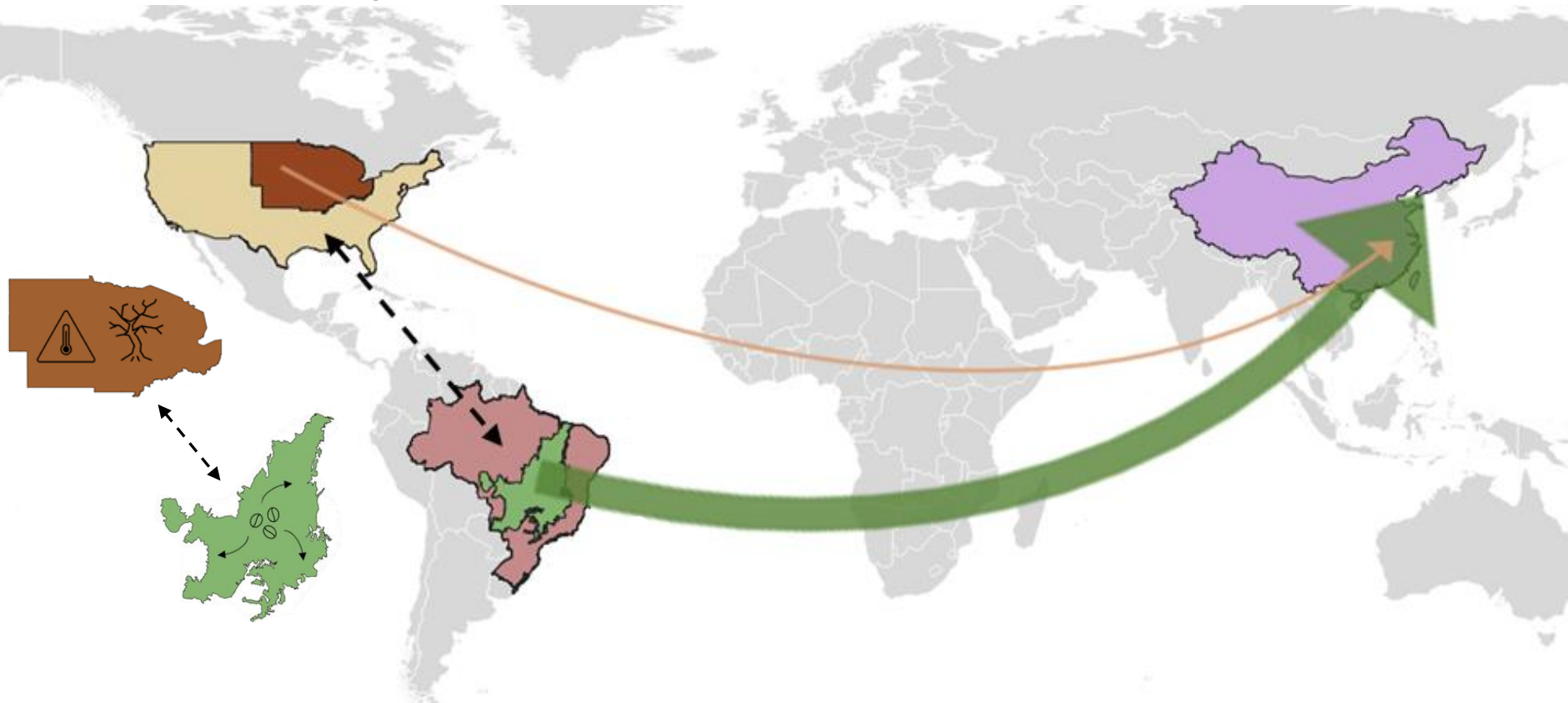


Quantitative Link Between
Drought & Land Change

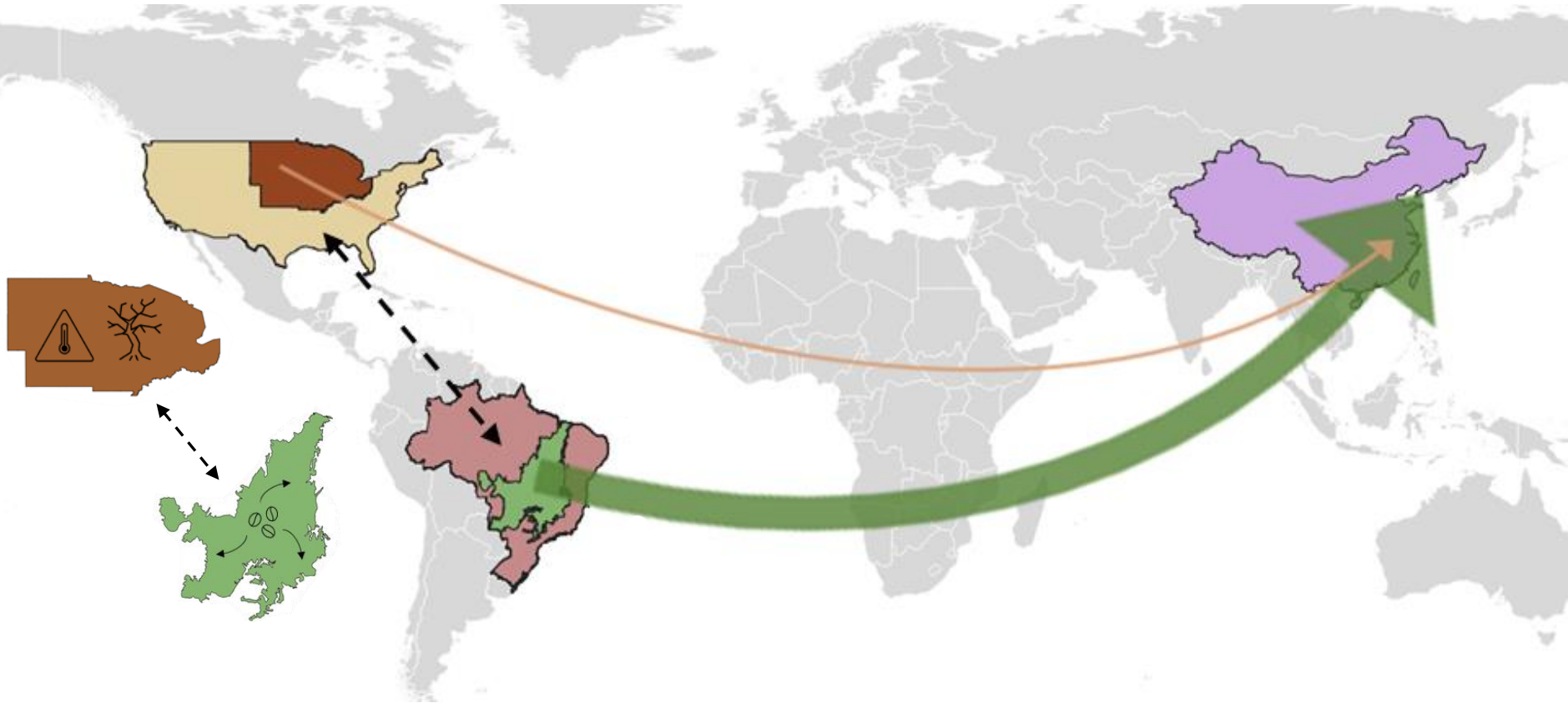
LIMITATIONS

- Market price is *more complicated* than a simple cause/effect
- Correlation \neq causation
- Only considers Midwest drought

In Summary...



In Summary...

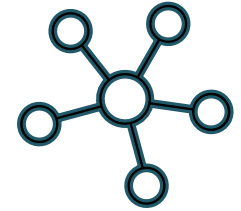


- Goal: measure 2012 drought impact on distant land change
- 1st step to understanding telecoupled disaster impacts

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ACKNOWLEDGEMENTS



- Dr. Jianguo “Jack” Liu
- National Science Foundation
- Center for Systems Integration & Sustainability
- MSU Fisheries & Wildlife Dept.
- Symposium Team
- You all!

