

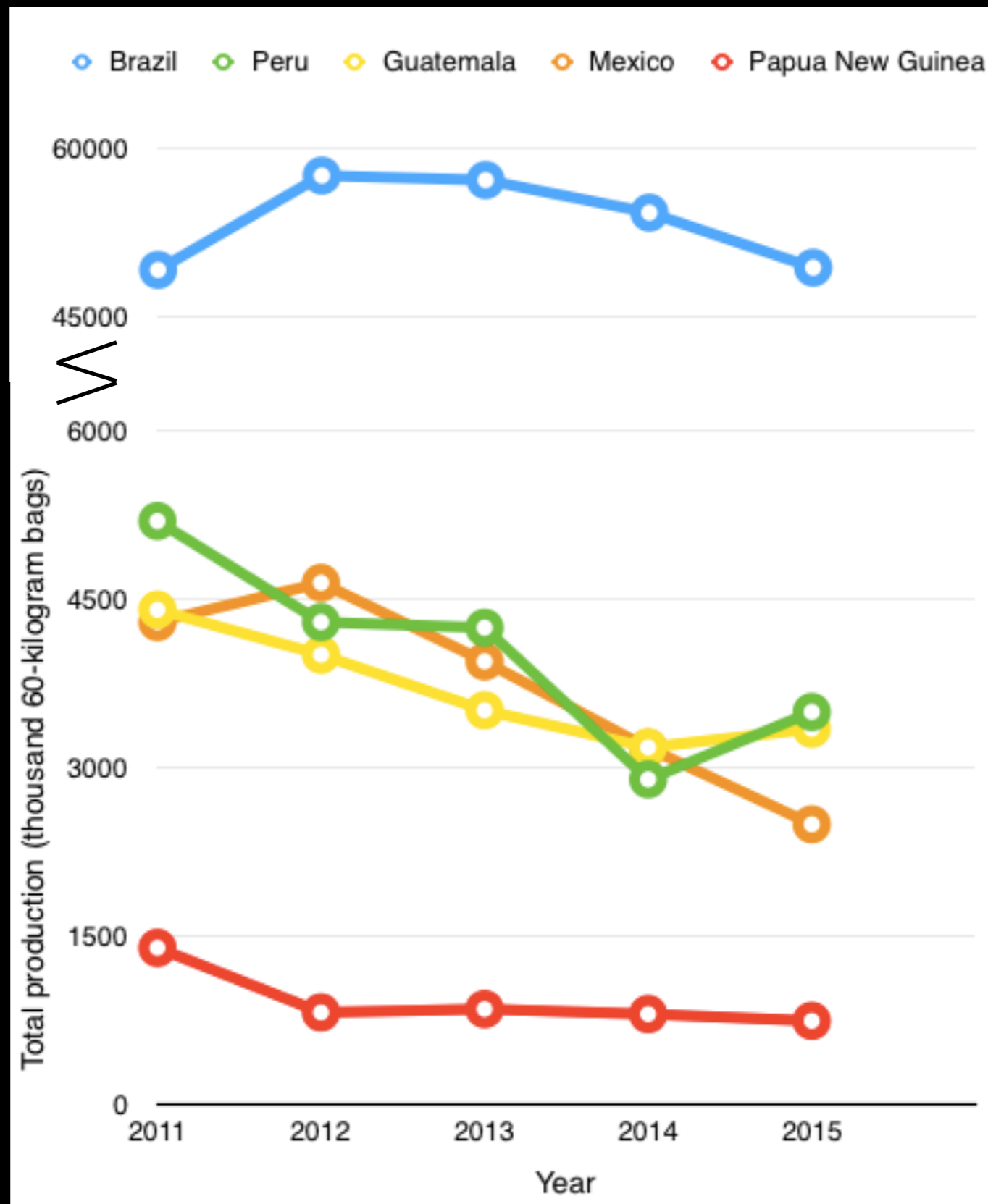


Trouble Brewing

Discovering new regions for optimal coffee growth


Samuel Cheang
Galvanize DSI Cohort 16

Decreasing production over the years in many countries



Coffee
biodiversity data
(127 species)

Nonnegative matrix factorization
Stochastic gradient descent



Recommender
system

What insight can we glean from our recommender system?

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- Not much..

Recommending places CURRENTLY
good for coffee planting is not helpful
if we are planning for the future

Coffee
biodiversity data
(127 species)

Nonnegative matrix factorization
Stochastic gradient descent

Current and
forecasted climate
data of Central and
South America
(19 bioclimatic variables
4 scenarios of the future
3 models)

Similarity using standardized
Euclidean distance

Recommender system

Coffea arabica L. (current)



Coffea arabica L. (2020-2049)



Implications

- Financially sensible expansion of coffee farmlands in Central American countries
- Diversification of crops or growth of more resistant coffee trees in Brazil

References

- http://www.ipcc-data.org/guidelines/pages/gcm_guide.html
- <http://www.espressocoffeeguide.com/all-about-coffee-2/coffee-plants/arabica-coffee/>
- <http://www.espressocoffeeguide.com/all-about-coffee-2/coffee-plants/robusta-coffee/>
- S Ponte, 'The "Latte Revolution"? Regulation, Markets and Consumption in the Global CoffeeChain,' World Development 30 (2002): 1099-1122 doi:10.1016/S0305-750X(02)00032-3.
- <http://apps.fas.usda.gov/psdonline/circulars/coffee.pdf>
- <https://www.theatlas.com/charts/ry6JYSDs>



Thank You

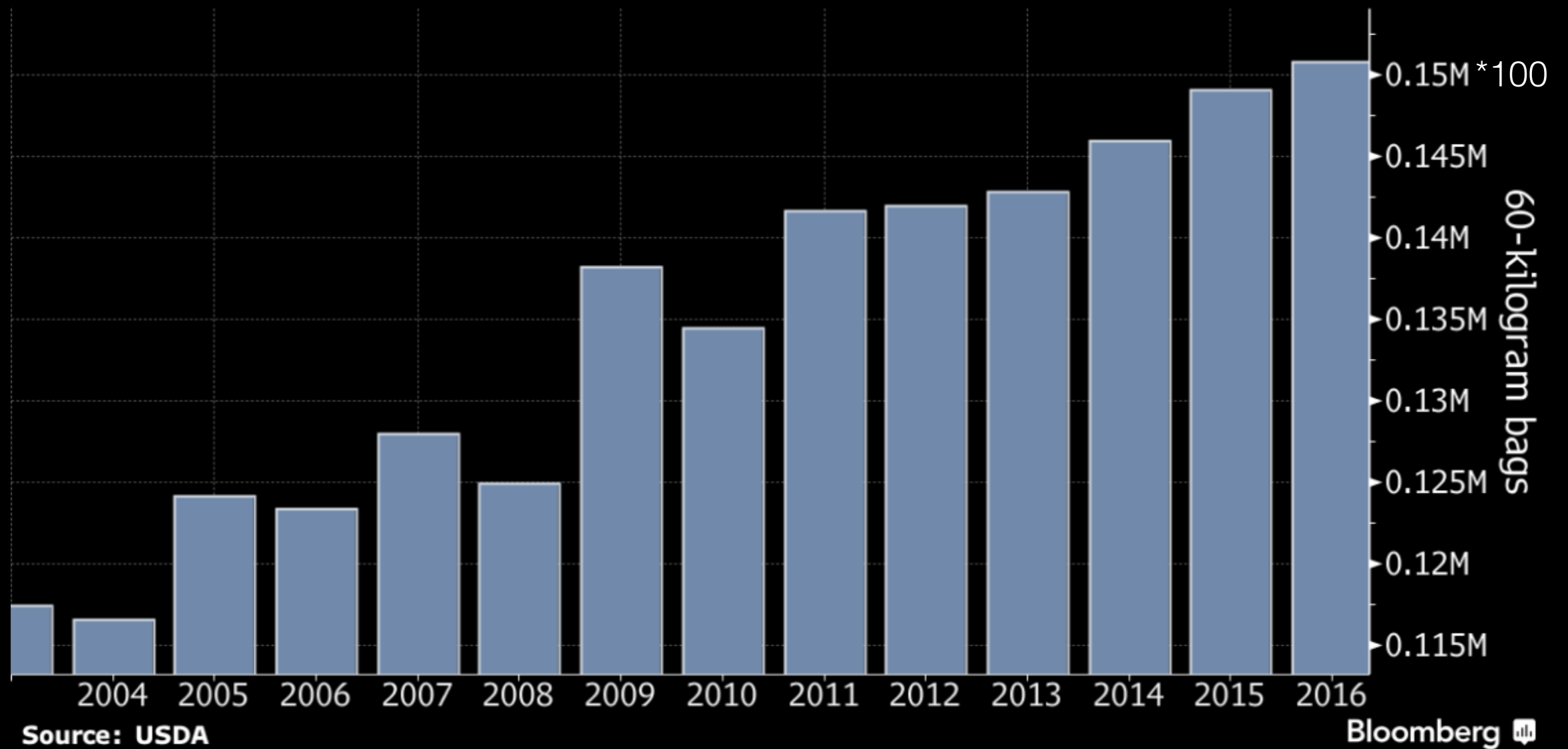
samuelcheang0419@gmail.com

<https://github.com/samuelcheang0419>

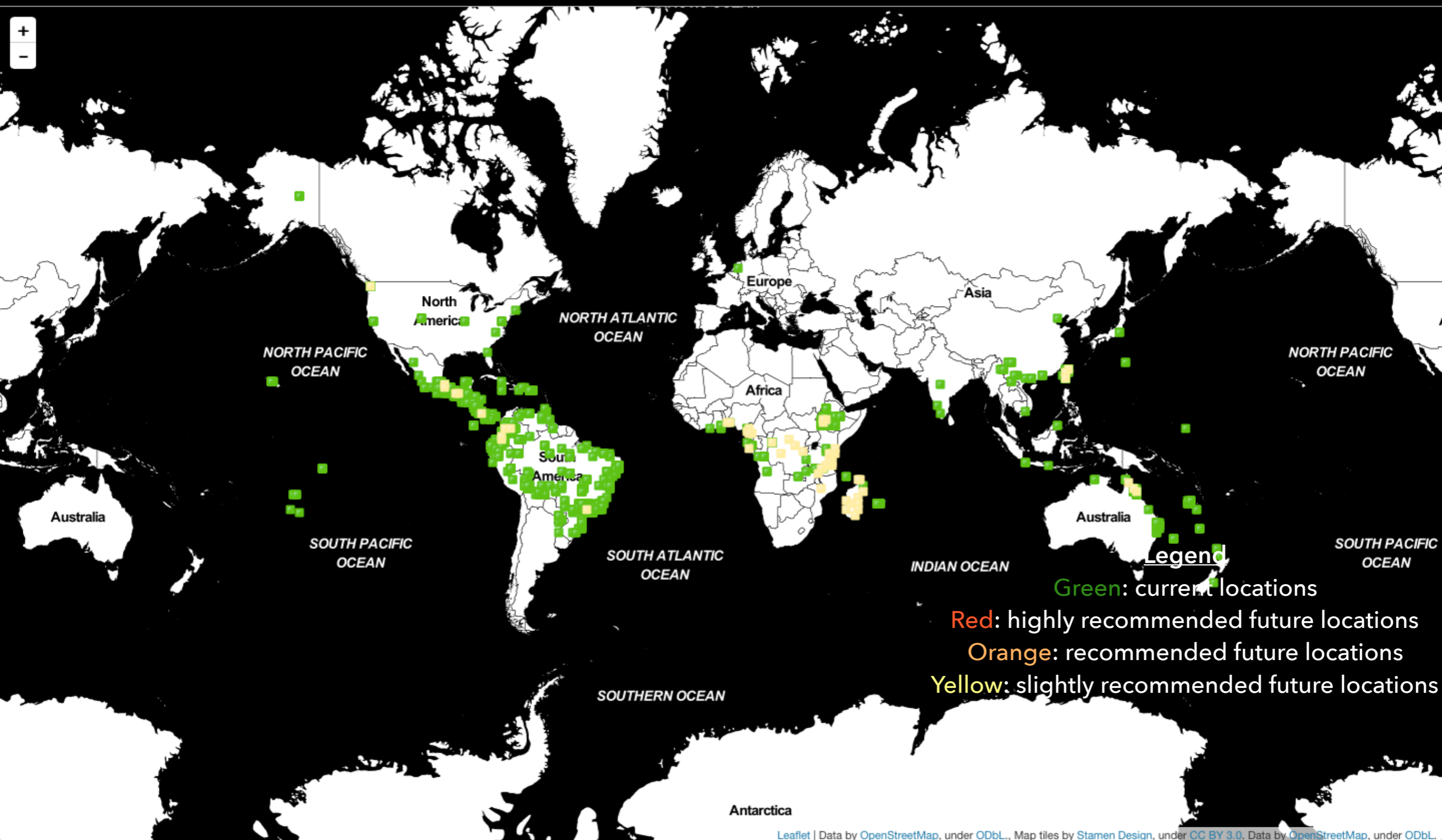
<https://www.linkedin.com/in/samuelcheang0419>

Coffee Cravings

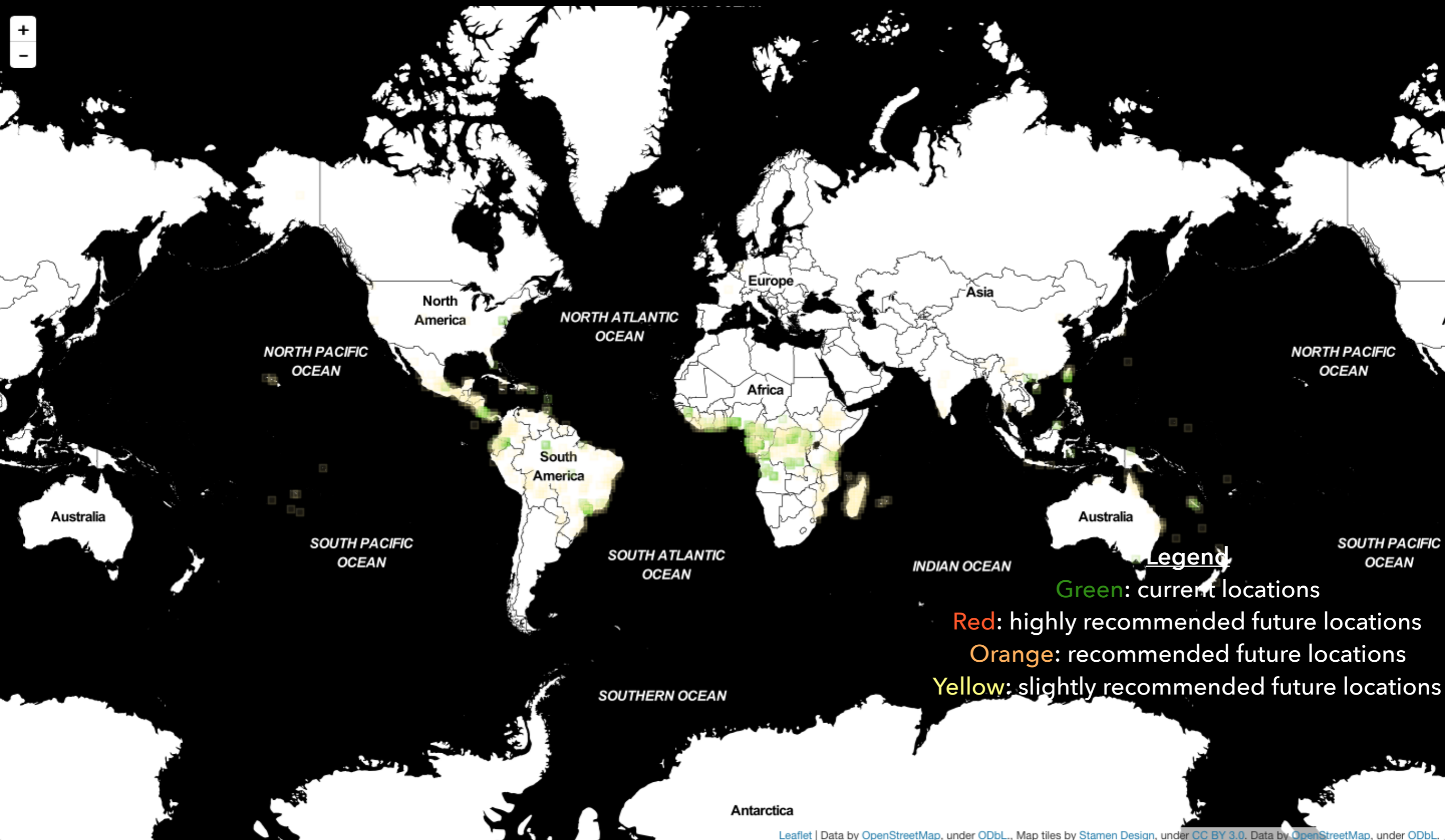
World demand is poised for a record



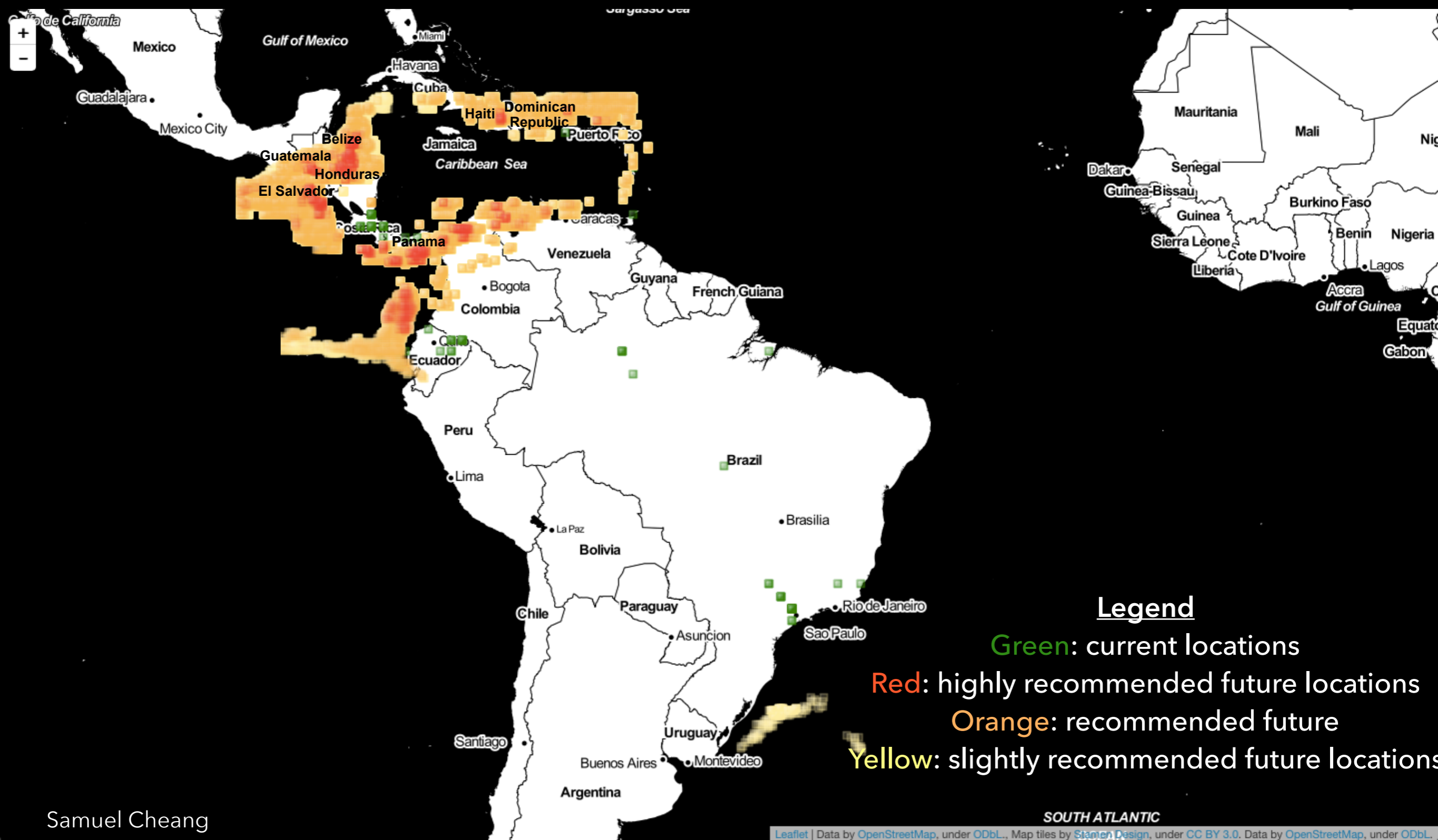
Coffea arabica L. (current)



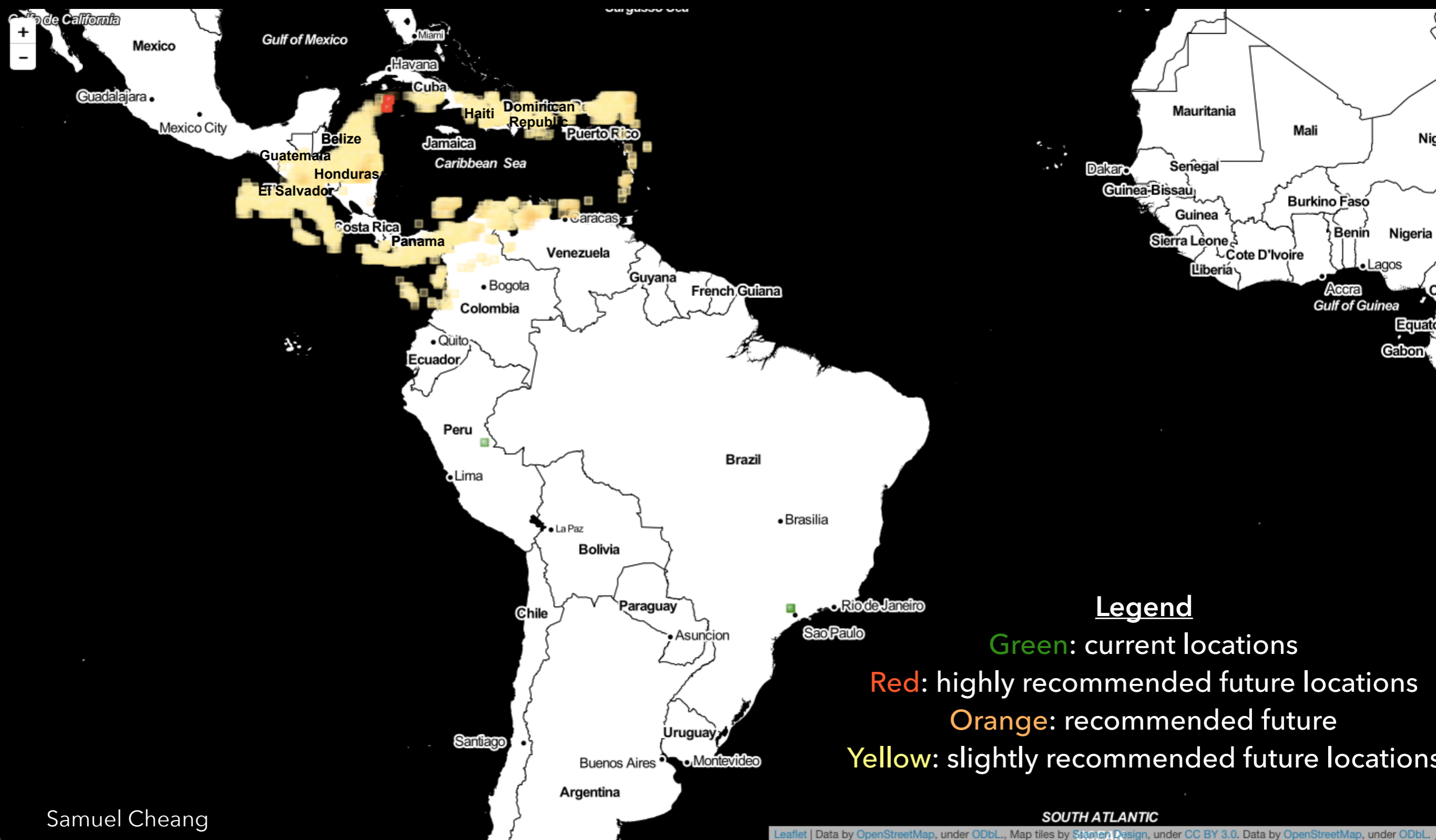
Coffea robusta L.Linden (current)



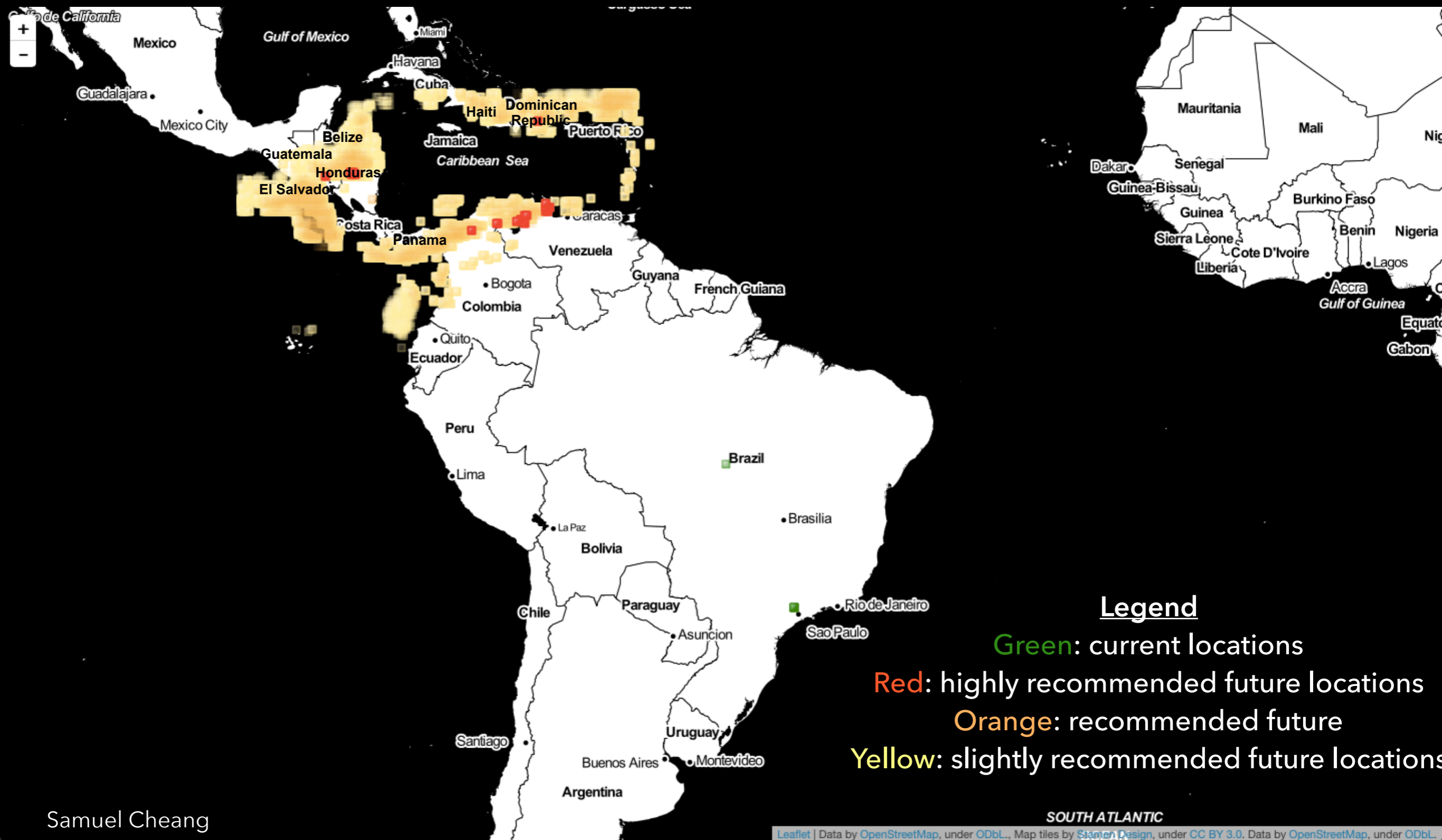
Coffea robusta L.Linden (2020-2049)



Coffea racemosa Lour. (2020-2049)

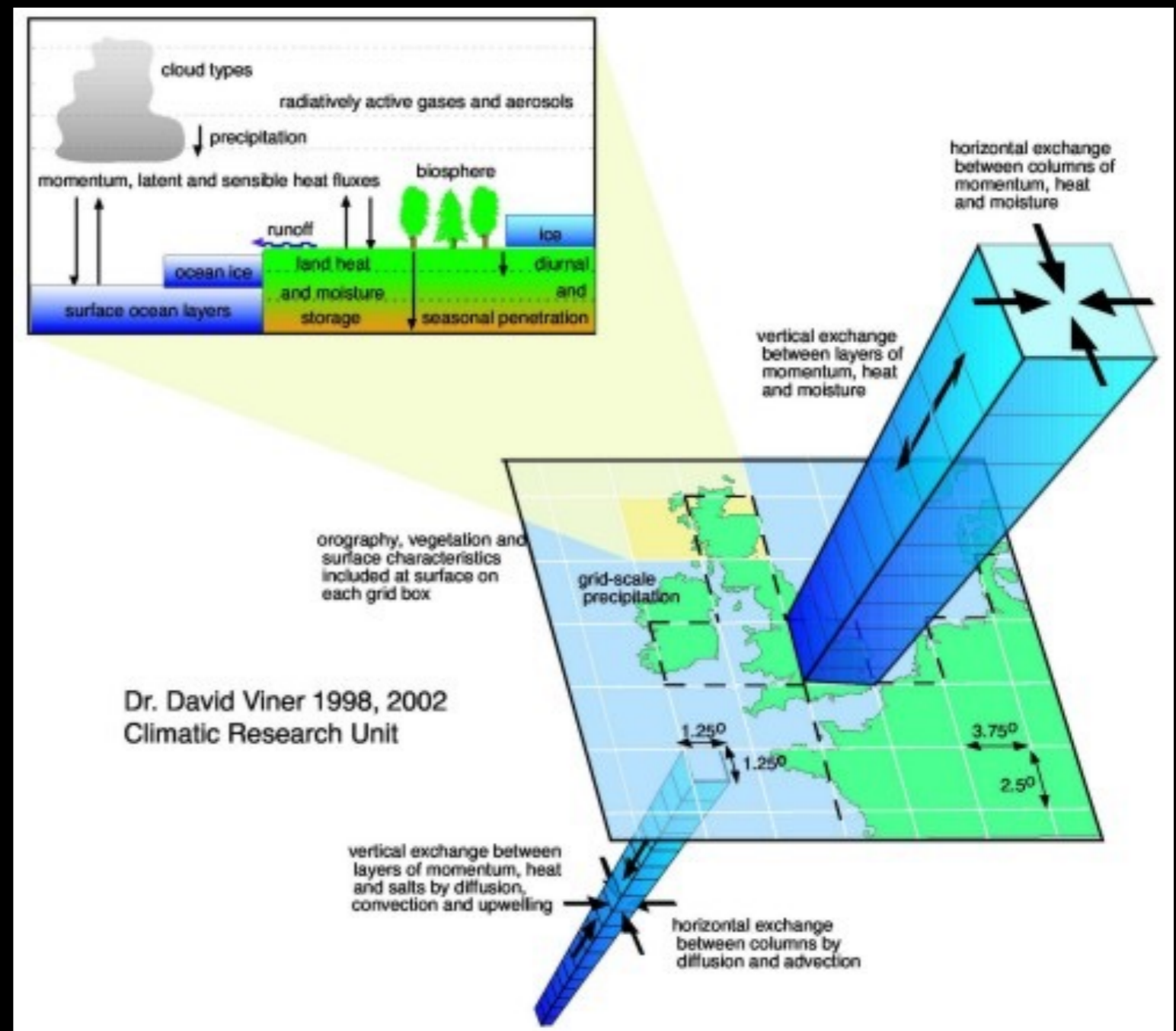


Coffea eugenii S.Moore (2020-2049)



General circulation model (GCM)

Mathematical model
simulating the
response of the global
climate system to
increasing
greenhouse gas
concentrations



What else can we do?

- Hope that the world's nations will abide by their commitments to limit global warming made during the international climate conference held in Paris last year (the Paris Agreement)
- Cross-breeding commercial coffee cultivars to become more resistant to climate change
- Consider alternative locations to grow coffee