Analysis of components of food production for sustainability in Canada

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Outline

TheoryMesh and food sustainability challenges

A bit background

Co-founders:

- Chris Bunio (mentor), Paul Westdal, Sephanie Westdal, Anne Kirk.
- Started 2019.
- Increasing transparency in the food supply chain.

Vision and Goals

1. Provide the platform to integrate data from first inputs to consumer purchase, creating a traceable, efficient and intelligent supply chain.
2. Certification.
3. Traceability.
4. Sustainability.

Outline

The problem proposed

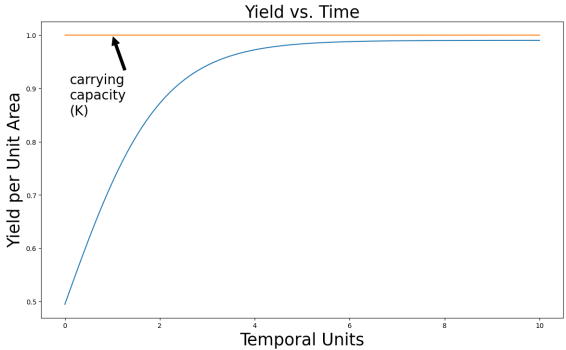
Expectations

TheoryMesh's goals from the PIMS can be presented as:

- Model and predict the environmental impact from agricultural practices.
- Complement the current TheoryMesh system.
- Combine both systems to measure and predict sustainability levels of products and companies.

Outline

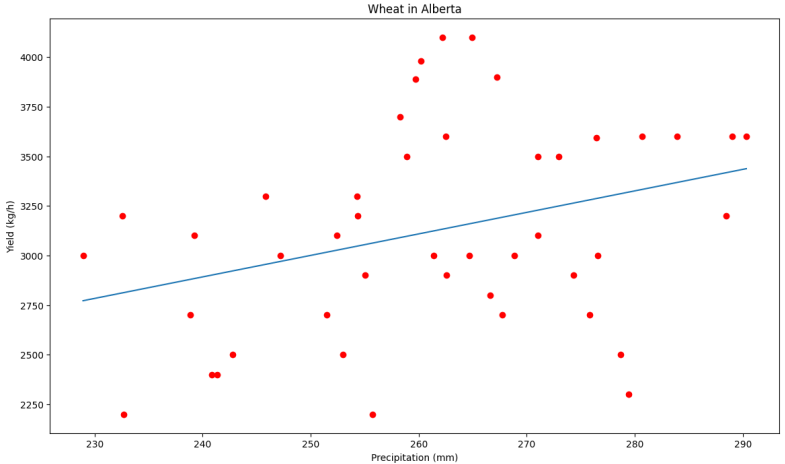
What can be gleaned from the data?



- $K = K(x_1, x_2, \ldots, x_n)$, where no x_i is a temporal variable.

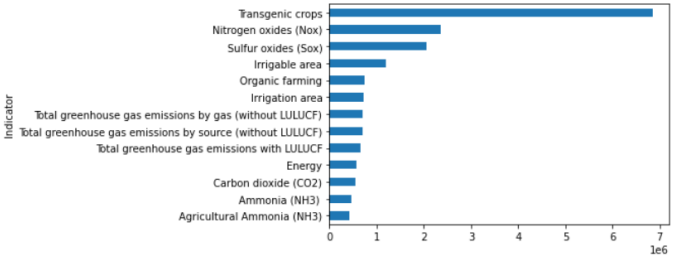
Factors Affecting K

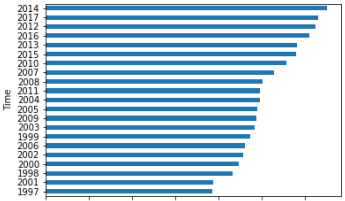
Yield vs. Precipitation in Alberta



Outline

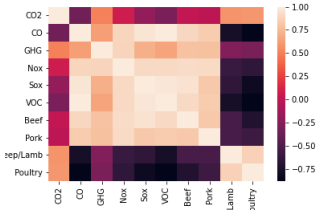
Environmental impact Canada: Amount of indicators from 1984-2017



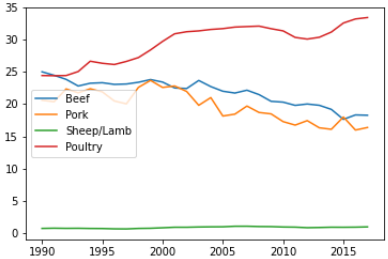


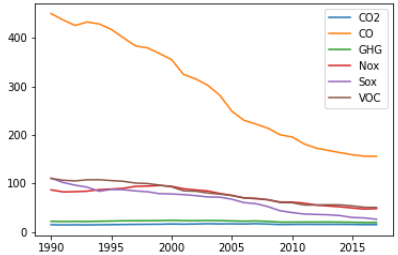
Correlation between Greenhouse gases and farms

	CO2	CO	GHG	Nox	Sox	VOC	Beef	Pork	Sheep/Lamb	Poultry
CO2	1.00	-0.34	0.50	0.07	-0.19	-0.30	0.02	-0.00	0.59	0.60
CO	-0.34	1.00	0.63	0.89	0.97	1.00	0.90	0.84	-0.77	-0.88
GHG	0.50	0.63	1.00	0.89	0.71	0.66	0.80	0.79	-0.26	-0.29
Nox	0.07	0.89	0.89	1.00	0.91	0.91	0.93	0.91	-0.60	-0.65
Sox	-0.19	0.97	0.71	0.91	1.00	0.97	0.95	0.83	-0.64	-0.82
VOC	-0.30	1.00	0.66	0.91	0.97	1.00	0.91	0.85	-0.77	-0.88
Beef	0.02	0.90	0.80	0.93	0.95	0.91	1.00	0.82	-0.52	-0.72
Pork	-0.00	0.84	0.79	0.91	0.83	0.85	0.82	1.00	-0.53	-0.58
Sheep/Lamb	0.59	-0.77	-0.26	-0.60	-0.64	-0.77	-0.52	-0.53	1.00	0.87
Poultry	0.60	-0.88	-0.29	-0.65	-0.82	-0.88	-0.72	-0.58	0.87	1.00

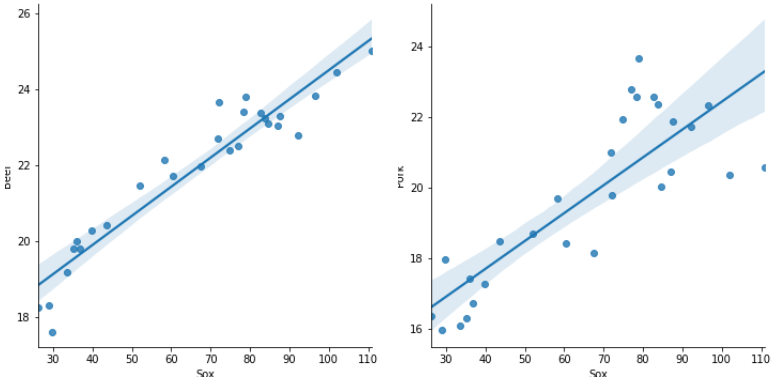


Growth farming and agriculture

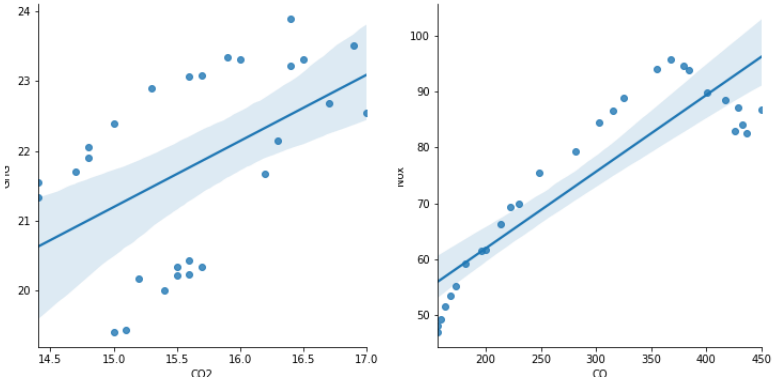




Correlation Beef-Sox and Pork-Sox



Correlation GhG-Co2 and Nox-CO



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