Big Data and Production Agriculture

A case study of the integration of agro-ecological, production, and financial data in the Map of Agriculture framework

Big Data I Panel: Leveraging Big Data in Agriculture Production
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- A market for a “Bloomberg for agriculture”?
- The Map of Agriculture’s approach to big data
- The Map of Agriculture as a platform for agricultural digital collaboration

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A market for a “Bloomberg for agriculture”?

Supply		Demand
conservis	Financial	Global AgInvesting
ONFARM GROW INFORMED	Production	DairyNZ Economic Survey 2013-14
THE CLIMATE CORPORATION	Agro-ecological	DIETER HELM NATURAL CAPITAL VALUING THE PLANET

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Causality in ag. production & management

Physical Production

Management

Financial

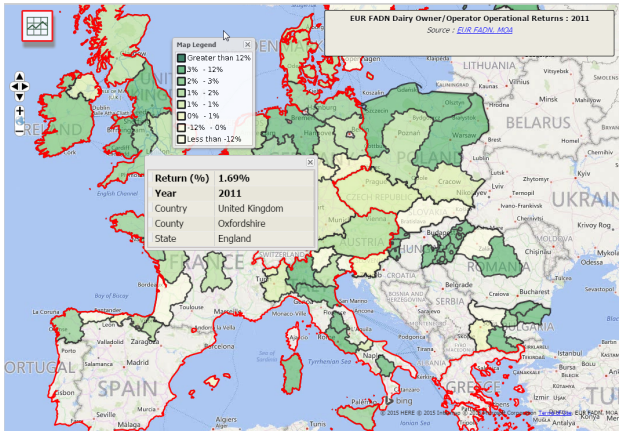
Production

Agro-
ecological

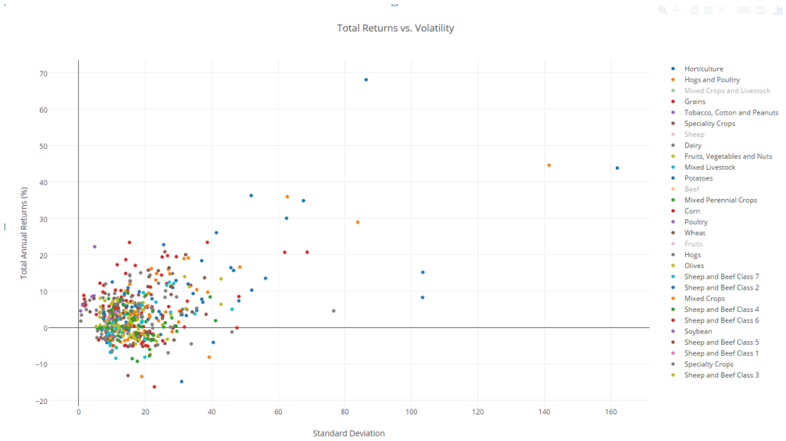
Data analysis and visualisation

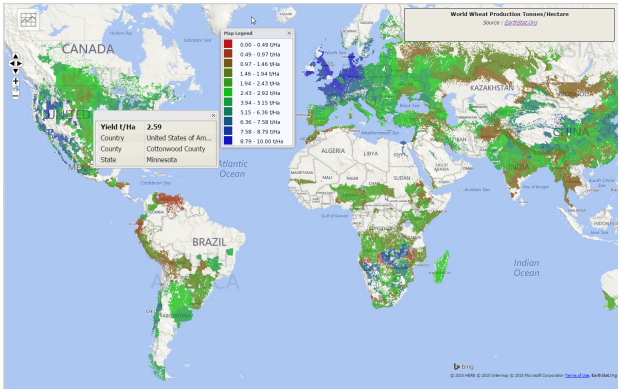
Geospatial

Statistical

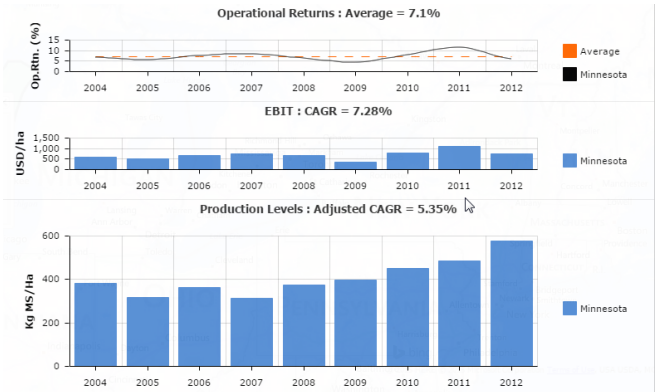


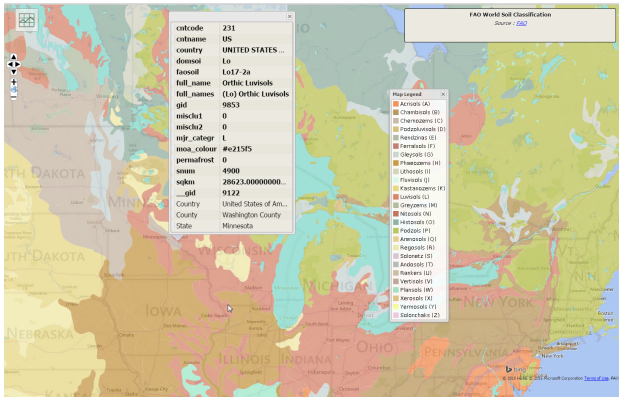
Financial



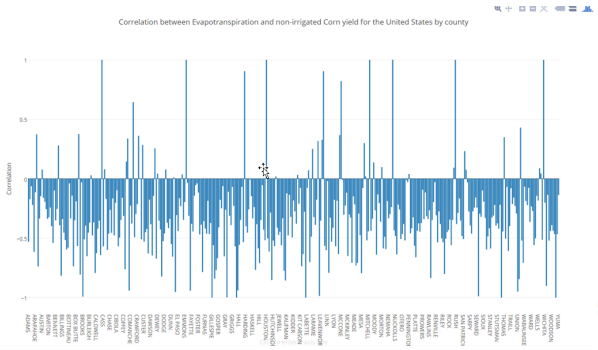


Production





Agro-ecological



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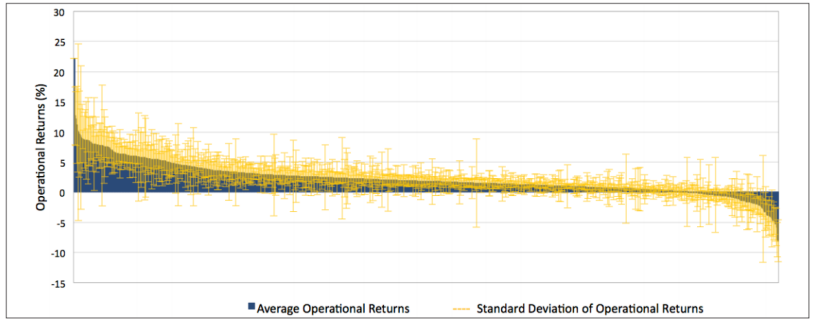
Scale and gran-ularity

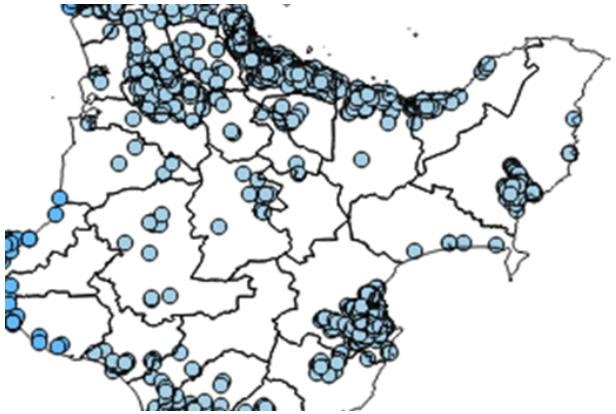
Macro

Exhibit 17: Operational returns for different land uses and regions



Source: Map of Agriculture MOA View. [15]

Meso



Micro

Nano

Animal No.	Milk (l) p.m.	Milk (l) a.m.	Fat (%) Previous	Fat (%) Current	Fat (kg) Previous	Fat (kg) Current	SCC (000) Previous	SCC (000) Current	Notes
1			5.46		0.93		15	0	Insufficient Sample
3			5.84		0.80		36	0	Insufficient Sample
17	2.80	3.90	5.82	4.58	0.97	0.31	129	79	
24			5.88		0.66		15	0	Insufficient Sample
34			5.34		0.45		27	0	Insufficient Sample
35							0	0	Insufficient Sample
38			5.71		0.85		44	0	Insufficient Sample
42	2.70	3.70	5.14	5.17	0.87	0.33	43	187	
46	3.80	5.20	6.19	5.82	1.04	0.52	37	54	
47	4.10	5.70	6.77	6.44	0.98	0.63	3305	2272	
51	4.80	6.60	6.75	7.00	1.37	0.80	67	95	
53	4.70	6.40	4.66	6.20	0.59	0.69	536	2510	
55	5.70	8.10	5.61	5.20	0.82	0.72	115	893	
57	3.70	5.20	5.90	5.77	0.96	0.51	32	69	
59	2.80	3.90	6.89	8.70	1.09	0.58	18	164	
69			6.08		0.41		26	0	Insufficient Sample
73	5.10	7.00	5.34	3.34	0.78	0.40	37	76	
75	1.70	2.40	5.98	5.29	1.11	0.22	176	430	

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MOA's ability to foster collaboration

- Open foundations
  - Database (PostGIS)
  - GIS system (GeoServer)
  - Development environment (Python, Django)
  - Analysis environment (Jupyter, IPython & GeoPandas)
- Planned development of collaborative features
  - Data management using a REST API (incl. hosted data)
  - IPython code collaboration using GitHub
  - Collaborative interaction using social media
  - Example datasets & analyses, e.g. replication of Plant (2012)
  - Collaborative editorial, review, and publishing

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MOA's organisational structure

- A farmer-led initiative with farmer control of farmer data
- Central MOA database, analysis & publication company
  - Based in Oxfordshire, UK
  - Commercialisation e.g. to institutional investors
  - Free provision of farm management solutions to farmers and academic researchers in exchange for participation
- Decentralised MOA coop. structure (e.g. MOA NZ)
  - Farmer trustees represent farmer interests
  - Set data standards and publication protocolls
    - e.g. anonymisation & aggregation before publication
  - Contractual relationship with central Map of Agriculture

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Questions for the Audience

- General comments on approach and ambition
- Could you see yourself using the Map of Agriculture?
  - If so, what products and features and why?
  - If not, what would inhibit you?
- Would you consider participating in the Map of Agriculture?
  - As a contributor of macro- and meso level data?
  - As a provider of micro (farm-level) & nano (precision farming) data?
  - As a Research Fellow working on geospatial and statistical analyses?
  - As an Advisory Fellow for a particular crop or farming system?

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