REACCH

Regional Approaches to Climate Change for Inland Pacific Northwest Cereal Production Systems

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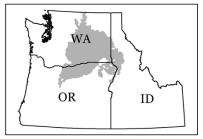
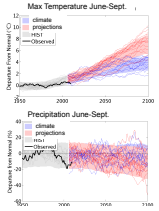
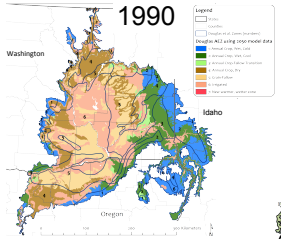
Challenge

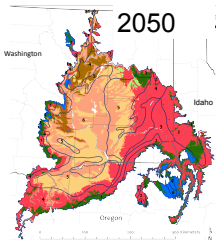
The Region and its Climate Projections



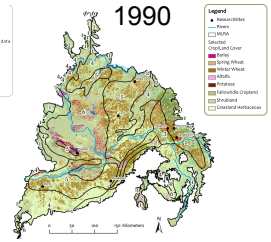


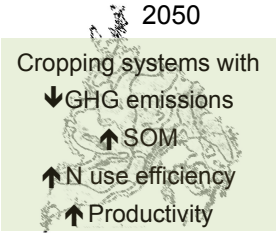
Changing Agroclimatic Zones





Changing Cropping Systems





Goals

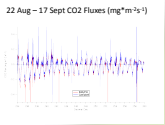
1. **Adaptation** - Develop and implement sustainable agricultural practices for cereal production within existing and projected agroecological zones of the region
2. **Mitigation** - Contribute to climate change mitigation through improved fertilizer, fuel, and pesticide use efficiency, increased sequestration of soil carbon, and reduced greenhouse gas (GHG) emissions
3. **Participation** – Promote science-based agricultural approaches to climate change adaptation and mitigation
4. **Education** - Increase the number of scientists, educators, and extension professionals with the skills and knowledge to address climate change and its interactions with agriculture

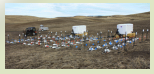
Approach

Monitoring Emissions

- 7 sites with eddy covariance-flux towers and chambers to monitor N_2O and CO_2 emissions

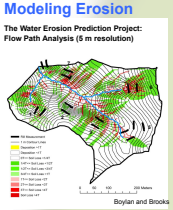
towers





chambers

Modeling Erosion



Boylan and Brooks

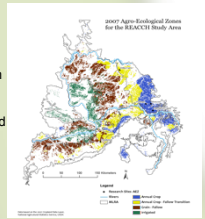
Instruments at REACCH Idaho Tower Site

Coupled Modeling Framework

- Climate Models: Downscaled ensemble of GCM outputs
- Cropping Systems: CropSyst
- Economic: Minimum-data tradeoff analysis model (TOA-MD5.0)
- Geospatially parameterized, integrated

Characterizing Dynamic Agroecological Zones

- A framework for monitoring, forecasting, modeling, experimentation, on-farm assessments, and Extension programming
- Based on NASS data and statistical procedures



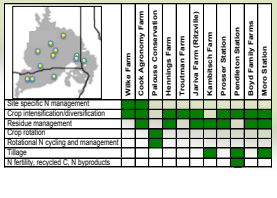
Assessing Economic and Social Dimensions

- Longitudinal surveys with > 40 cooperating producers to assess farm budgets, practices, and adoption
- Broad-based survey of region's stakeholders to assess knowledge and attitudes concerning climate change and agriculture
- Building decision aids based on these surveys

REACCH team members

Replicated Trials of Alternative Systems

- Long-term trials (15, including continued and newly established experiments).



Pests, Weeds, Pathogens

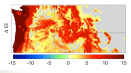
Monitoring

Samples from >40 grower cooperators and other locations for insect pests, pathogens, weeds and earthworms in 2011 and 2013

Organisms and sample sites

Modeling

Example: Change in cereal leaf beetle suitability by mid 21st century (warmer color = > increase)



Data Mining

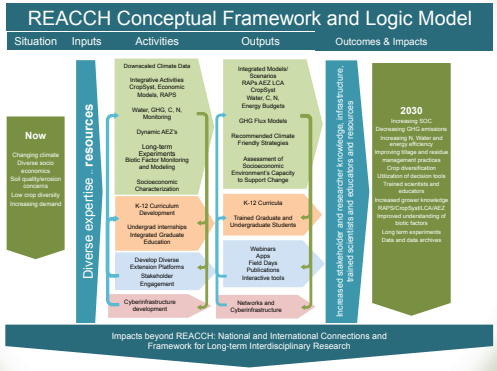
Example: 17-year aphid suction trap records and climate variables

Aphid suction trap sites

Data Management

- System for data input, tagging, storage, access, display and synthesis
- Project-wide data policy
- On-line data portal

REACCH Conceptual Framework and Logic Model



Extending our Work

- Presentations, field days, videos, web based and printed publications in production
- Annual Mini-grants program
- Case studies
- Decision support tools
- Stakeholder advisory committee
- Extension faculty member

Stakeholder Advisors

Field Day

K-20 Education

- K-12 teacher surveys
- High school curriculum design
- Annual teacher workshops
- Annual summer intern program
- 32 Graduate students and postdocs
- Grad retreats: Sep. 2012, July 2013

Summer Interns

Elementary School Class

Graduate Students

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