Kansas Water Management Challenges and the U.S. Federal Crop Insurance Program

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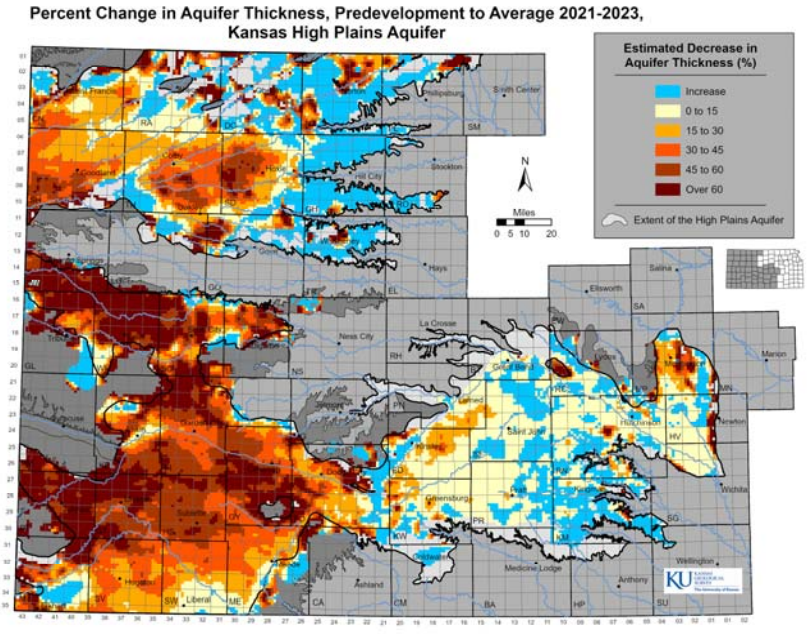
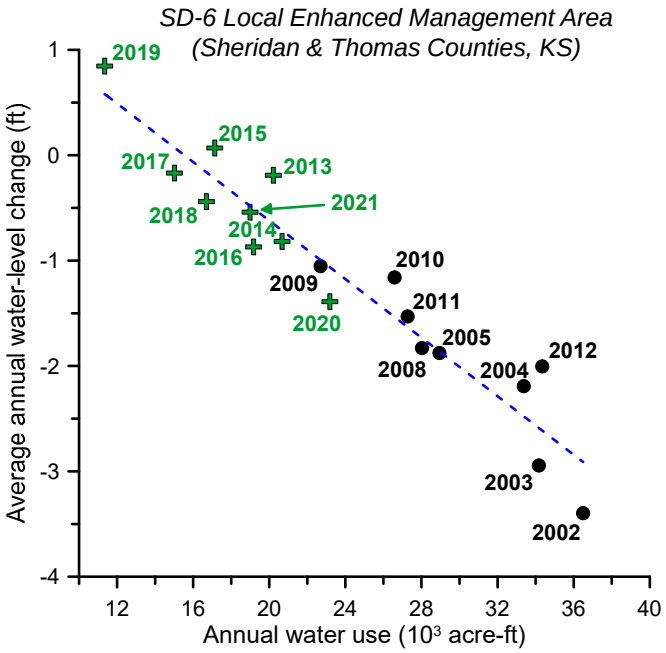
Why is a hydrologist here?



- Every year, KGS and DWR go out and measure water levels in ~1400 wells in the High Plains Aquifer
- Long-term declines in water levels over much of western portions of the state
  - GMDs 4, 1, 3

Why is a hydrologist here?



- Every year, KGS and DWR go out and measure water levels in ~1400 wells in the High Plains Aquifer
- Long-term declines in water levels over much of western portions of the state
  - GMDs 4, 1, 3
- Groundwater declines caused by pumping

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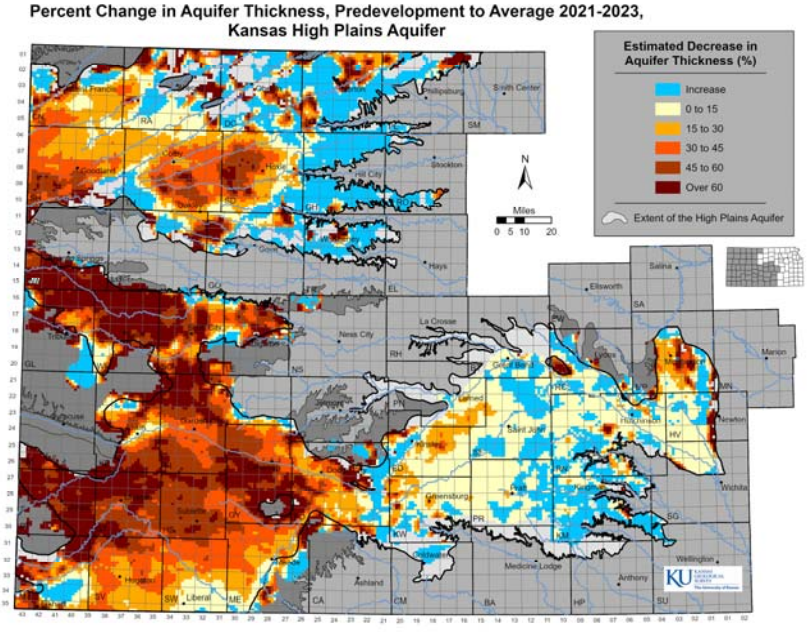
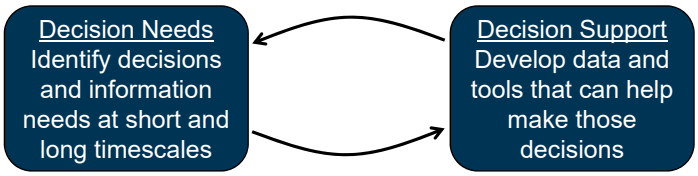


- Aquifer depletion creates long-term risk to viability of irrigated agriculture
- One challenge: Balancing short-term needs and long-term viability
  - Short-term: Irrigation for crop production
  - Long-term: Sufficient water to support agriculture

NASA Applications Project

- Question: How do competing short-term and long-term ag/water priorities interact to drive decision-making?

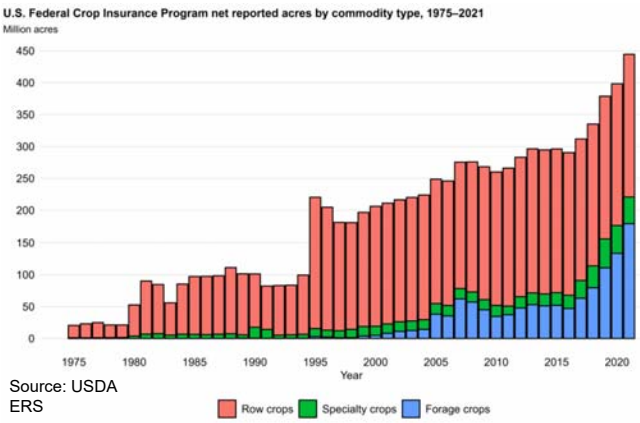


- Decision assessment
  - 17 conversations with 25 decision-makers
  - Groups: farmers, farmer-serving organizations, state and city water agencies, legislative staff, applied researchers, …
- Recurring theme: Critical role of crop insurance in decision-making
  - Affects crop choice, management, etc.

Farm near Moundridge, Kansas

Crop insurance (the hydrologist's perspective)

- Core USDA program supporting agriculture
- A program to support production → mandate is not water conservation
- Most years, most losses are linked to water issues (drought, excess moisture)



Source: USDA ERS

Crop insurance (the hydrologist's perspective)

- Core USDA program supporting agriculture
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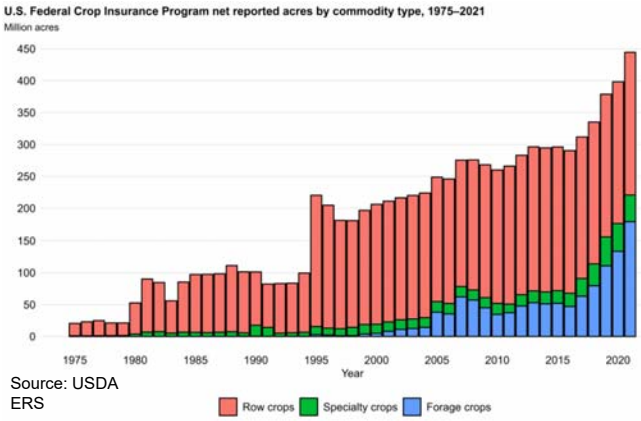
- Most years, most losses are linked to water issues (drought, excess moisture)
- Two converging trends:
  - Increasing crop insurance coverage and importance
  - Declining groundwater levels



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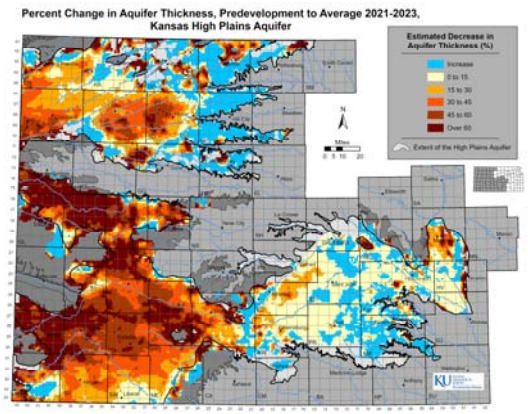


Crop Insurance & Water Management Summit

- Goal: Identify research, education, data, and policy needs that could facilitate agricultural water conservation efforts aligned with current or potentially modified crop insurance programs
- 35 attendees
  - 16 "research" – Kansas Geological Survey, K-State, Virginia Tech, NASA, …
  - 19 "applications" – producers, USDA, KS Department of Agriculture, Kansas Farm Bureau, Groundwater Management Districts, …
- Organized by KGS, K-State, USDA RMA
- Details in Zipper et al. (2024) KGS Open File Report → identifies 10 challenges

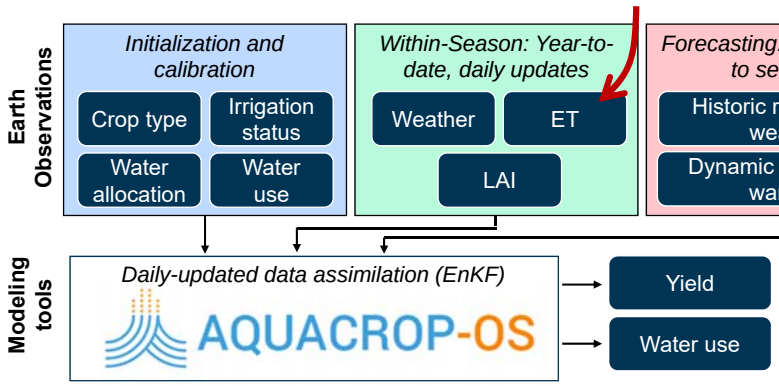
Crop Insurance & Water Management Summit

Challenge: Crop failure during drought

- Issue: Crop failure when well yields can't keep up during extreme hot/dry conditions - lags between issue and adjustment.
- Desired outcome: Ability to stop irrigation based on forecast and/or field conditions more rapidly.
- Solution (or next steps):
  - Well-validated forecast tool that can determine yield potential based on current conditions and well capacity for use in adjustment
  - Historical estimate of potential water savings from alternative approach
- Obstacles:
  - Any forecast must be demonstrated to perform better than current approaches (stand count) - would need to get field-resolution data from producers
  - Contracts dictate if there is yield potential, producer must continue to manage to realize that potential → no mechanism for RMA to pay loss

Yield and water use forecasting framework

- Goal: Forecasts of yield and water use under current and reduced irrigation, based on current year-to-date conditions.
  - Developed data assimilation modeling framework
- Question 1: Can remotely sensed ET data provide accurate estimates of within-season crop water use?



Wayne Ndlovu

Mahbubur Rahman

Forage Insurance: the Issue

- Forage production supports the livestock industry
- Increasing forage production, particularly higher-value forage, may be a way for producers to adapt as / when water availability declines

Forage Insurance: Options

	Benefits	Drawbacks
Multi-peril Crop Insurance Products (MPCI): Standard RP/YP/APH Silage-specific options Forage seeding	• Personalized to an individual producers • Prices often based on markets, with contract price option • Familiar to commodity crop producers	• New / learning curve • Not available for all forage crops • Yield can be challenging to measure • YP only for silage limits drought protection
Index Insurance: Pasture, Rangeland and Forage (PRF) Annual Forage	• No yield measurement or production history required • Relatively simple • No claims process	• Not farm-level / basis risk • Doesn't cover all perils • Can't fully cover higher-value forages, including alfalfa • Payment rate is consistent
Whole Farm Revenue	• Good value for all production on a farm	• Rarely used, requires Schedule F

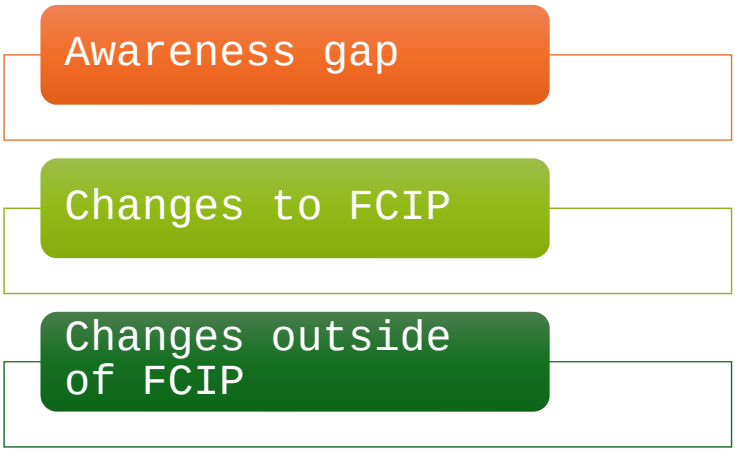
Limited Irrigation: the issue

- Irrigated practice requires sufficient water availability and use to meet yield goals
- Producers with limited water availability may not be able to purchased irrigated coverage, but non-irrigated would provide very limited protection
  - Potential yield is between irrigated and non-irrigated practice

Limited Irrigation – Basics and Challenges

- Through a written agreement, producers can have 'limited irrigation' practice
  - No longer forced to either either irrigated or non-irrigated practice
- Use has been limited
  - Written agreement…
  - Likely underestimates impact

Challenges, opportunities, ongoing work



Awareness gap

- The issue: new products, new options, learning curve
- Ongoing efforts
  - Crop insurance industry education
  - Extension education
    - https://agmanager.info/crop-insurance/livestock-insurance-papers-and-information/annual-forage-insurance-policy-basics-and
    - https://enewsletters.k-state.edu/beeftips/2021/11/01/ten-things-to-know-about-pasture-rangeland-and-forage-insurance/
    - Beta version: https://agmanager.info/hay-inventory-calculator
    - Potential improvement: more videos?
- Question: awareness versus suitability?

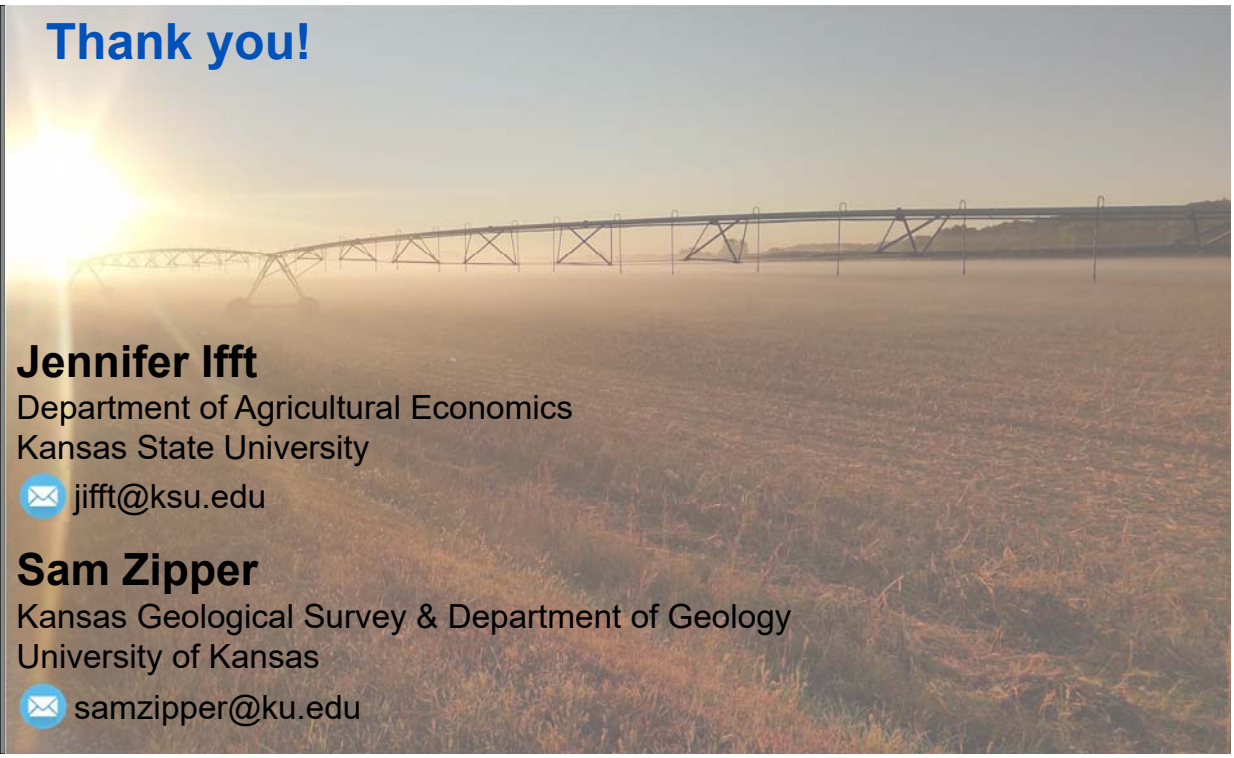
Changes to FCIP

- Changes to existing policies
  - Loss adjustment: drought, crop insurance, and crop failure
  - Expanded price/value options
  - Conservation endorsements
- New Policies
  - MPCI options gradually expanding
  - New index insurance products, for example drought/extreme heat
- Challenges
  - Must be insurance (rate-able)
  - Feasible options may not be effective options

Changes outside of FCIP

- Underlying economics: High corn profitability and guarantee / APH
- Multi-year initiatives
  - Crop insurance by design covers a single year
- Where can other programs fill these gaps?

Thank you!



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