Changes in Crop Mix

Presentation to the Comprehensive Aquifer Management Plan Committee
Idaho Falls, February 2008

B. Contor
Summary of Written Report

- Assessment of changes that have occurred
- Assessment of potential to affect water budget by adjusting crop mix
Why do we care?

Typical Evapotranspiration

Annual ET (ft)

Crop

ALFM_ET
WGRN_ET
SGRN_ET
BEET_ET
POTA_ET
BEAN_ET
FCRN_ET
SCRN_ET
1: Assessment of changes

- Crop *percentage* by county 1980 - 2006
- Other effects held *constant*
  - Use *same acreage map* for all years
  - Use *same ET values* for all years
- What would have been each year's consumptive water use with the *sample acreage* and *sample ET*?
  - This *isolates* the effect of crop-mix changes
Crop data from Ag Statistics Service
Irrigated lands from IDWR analysis of LANDSAT
Evapotranspiration from BOR/NRCS AGRIMET
Results:
Bingham County Crop Mix 1980

- WinWht: 17%
- Alfalfa: 15%
- Barley: 11%
- GrCom: 0%
- SilCom: 1%
- Oats: 1%
- SprWht: 35%
- Potatoes: 18%
- SugBeet: 2%

Bingham County Crop Mix 1990

- WinWht: 28%
- Alfalfa: 13%
- Barley: 8%
- GrCom: 0%
- SilCom: 0%
- Oats: 0%
- SprWht: 21%
- Potatoes: 26%
- SugBeet: 4%

Bingham County Crop Mix 2006

- WinWht: 26%
- Alfalfa: 26%
- SprWht: 15%
- Barley: 7%
- GrCom: 0%
- SilCom: 0%
- Oats: 0%
- Potatoes: 18%
- SugBeet: 8%
Danger, Will Robinson!

Figure 10
Bottom Line:

• Upward trend in total Consumptive Use
  – statistically significant even considering auto-correlation
  – very small percentage-wise; 0.04 to 0.14% per year
  – small percentages of big numbers can still add up
Bottom Line:

• Total consumptive use of 2006 crop mix is about **120,000** acre feet per year more than 1980 crop mix
2: Potential adjustments
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• Start with 2006 crop mix
  – not an "unusual" year

• Switch to lower-consumptive crops
  – 10% of alfalfa ---> convert to barley
  – 10% of silage corn ---> convert to barley
  – *why not sugar beets?*
2: Potential adjustments

• Use fallow in rotation with cash crops
  – assume 3-year potato rotation
    (2 yrs out/ 1 yr in)
  – if we influence 1/4 of the rotation acres then
    the potential is 50% of total potato acreage
  – on those acres assume barley ---> fallow

• Calculate difference in consumptive use
Bottom Line

• 300,000 acre feet/year from fallow rotation with potatoes

• 50,000 acre feet/year from replacing some alfalfa & silage with barley

• Potential aquifer benefit 350,000 acre feet per year
Summary

• Historic changes equivalent to 120,000 acre feet/year

• Fallow rotation could benefit the aquifer 300,000 acre feet per year

• Replacing 10% of alfalfa & silage corn with barley could benefit the aquifer 50,000 acre feet per year
Next Steps?

• What would it cost to implement?
• What kind of participation rate is feasible?
  – we assumed 10% of alfalfa/silage acres
  – we assumed 25% of potato rotation acres
• What would be possible if barley returned to historically “normal” prices?
Discussion