stream assessment

References

Cruz, R. (2012). Assessing the Health of Streams in Agricultural Landscapes: How Land Management Changes Impact Water Quality. R. Cruse, editor. A technical report by the Council on Agricultural Science and Technology (CAST): Ames, Iowa.

Schilling, K. E., & Libra, R. D. (2003). INCREASED BASEFLOW IN IOWA OVER THE SECOND HALF OF THE 20TH CENTURY1. JAWRA Journal of the American Water Resources Association, 39(4), 851-860.Smith
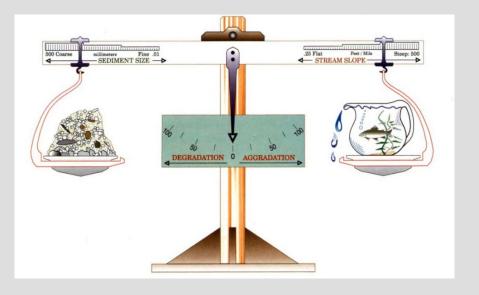
Smith, E. A. (2012). Spatial and temporal variability of preferential flow in a subsurface-drained landscape in north-central Iowa. University of Minnesota.

Wagner, M.M. 2011. Ames Stream Assessment 2011. Ames, Iowa. Final Report, February 6, 2012.

Wagner, M. M., & Gobster, P. H. (2007). Interpreting landscape change: Measured biophysical change and surrounding social context. Landscape and Urban Planning, 81(1), 67-80.Wendt 2007

Wendt, A. A. (2007). Watershed Planning in Central Iowa: An Integrated Assessment of the Squaw Creek Watershed for Prioritization of Conservation Practice Establishment. ProQuest.
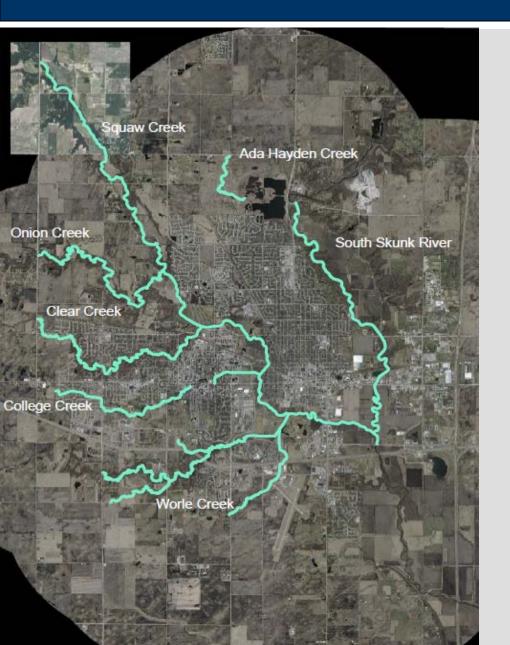
Hydrology

- **Decreased grassland**
- **Changes to riparian vegetation cover**
- **Drainage**
- **General increase in annual precip**
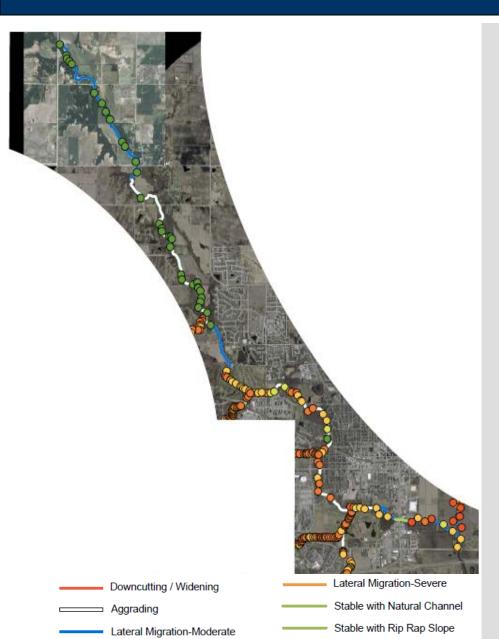- **Increase in # of rainfall events exceeding 2 inches in 24 hours**

stream assessment

Wagner 2011

- **Quantitative**
- **Lower watershed focus (Ames)**
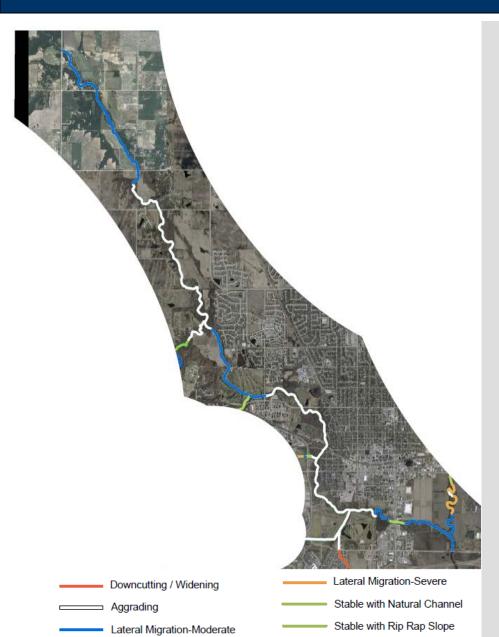- **41 miles of perennial stream**

Wagner 2011

- **Bank Erosion**
  - Estimate of sediment loading
  - 25-30k tons of gross sediment
- **2006 to 2011 Comparison**
  - aside from 2010 flood little overall change in channel morphology

Legend:
- Downcutting / Widening
- Aggrading
- Lateral Migration-Moderate
- Lateral Migration-Severe
- Stable with Natural Channel
- Stable with Rip Rap Slope

Wagner 2011

- **Bank Erosion**
  - Estimate of sediment loading
  - 25-30k tons of gross sediment
- **2006 to 2011 Comparison**
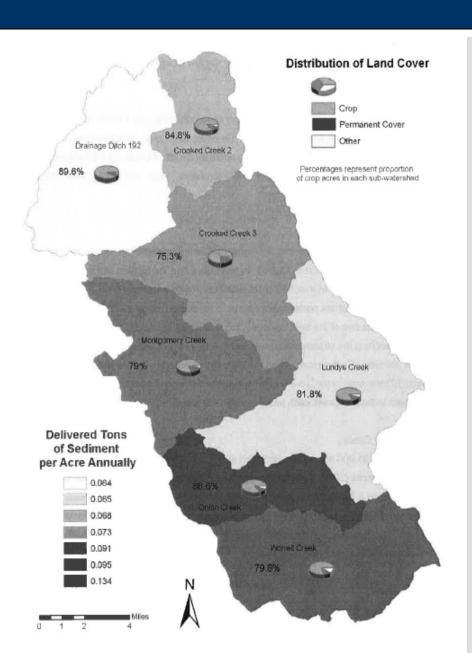 - aside from 2010 flood little overall change in channel morphology

Legend:
- Downcutting / Widening
- Aggrading
- Lateral Migration-Moderate
- Lateral Migration-Severe
- Stable with Natural Channel
- Stable with Rip Rap Slope

Survey Parameter	Categories				
Substrate	Boulder	Cobble	Gravel	Sand	Silt/Mud
# of surveys : 340	17	31	94	156	42
	5.0%	9.1%	27.6%	45.9%	12.4%
Bank Stability	Artificially Stable	Stable	Mod. Stable	Mod. Unstable	Unstable
# of surveys : 346	4	41	168	103	30
	1.2%	11.8%	48.6%	29.8%	8.7%
% of Bank Bare	0-20%	20-40%	40-60%	60-80%	80-100%
# of surveys : 346	150	106	47	28	15
	43.4%	30.6%	13.6%	8.1%	4.3%
Bank Height	0-3'	3-6'	6-10'	10-15'	>15'
# of surveys : 346	30	256	50	5	5
	8.7%	74.0%	14.5%	1.4%	1.4%
Livestock Access	Yes	No			
# of surveys : 346	77	269			
	22.3%	77.7%			

Wendt

- **Entire watershed**
  - **Representative reaches**
  - **Excludes ditches**
- **Qualitative stream assessment**
- **Field erosion & buffer conditions**
- **Sediment delivery "hot spots"**

Distribution of Land Cover

Crop
Permanent Cover
Other

Percentages represent proportion of crop acres in each sub-watershed

Delivered Tons of Sediment per Acre Annually

0.064
0.065
0.068
0.073
0.091
0.095
0.134

Wendt

- **Entire watershed**
  - **Representative reaches**
  - **Excludes ditches**
- **Qualitative stream assessment**
- **Field erosion & buffer conditions**
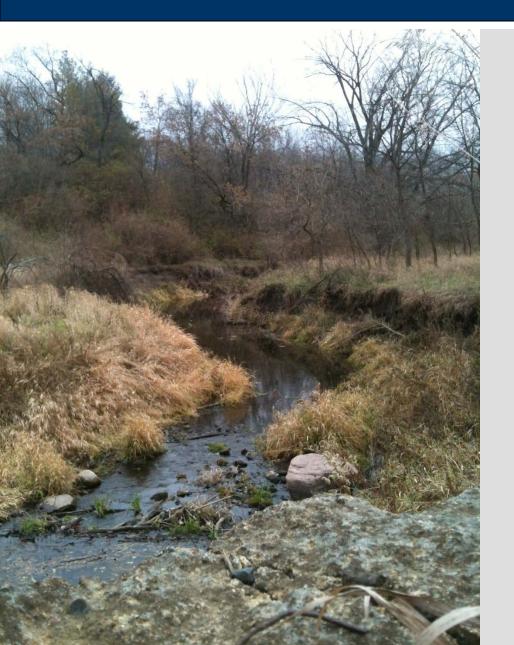- **Sediment delivery "hot spots"**

stream assessment

Reaction

- **Unclear how much sediment has been transported versus contained**
- **Unclear % of field and bank**
- **Impacts of ditch maintenance**
- **Contradiction of two primary studies**
- **Underestimate of field erosion (gully)**