

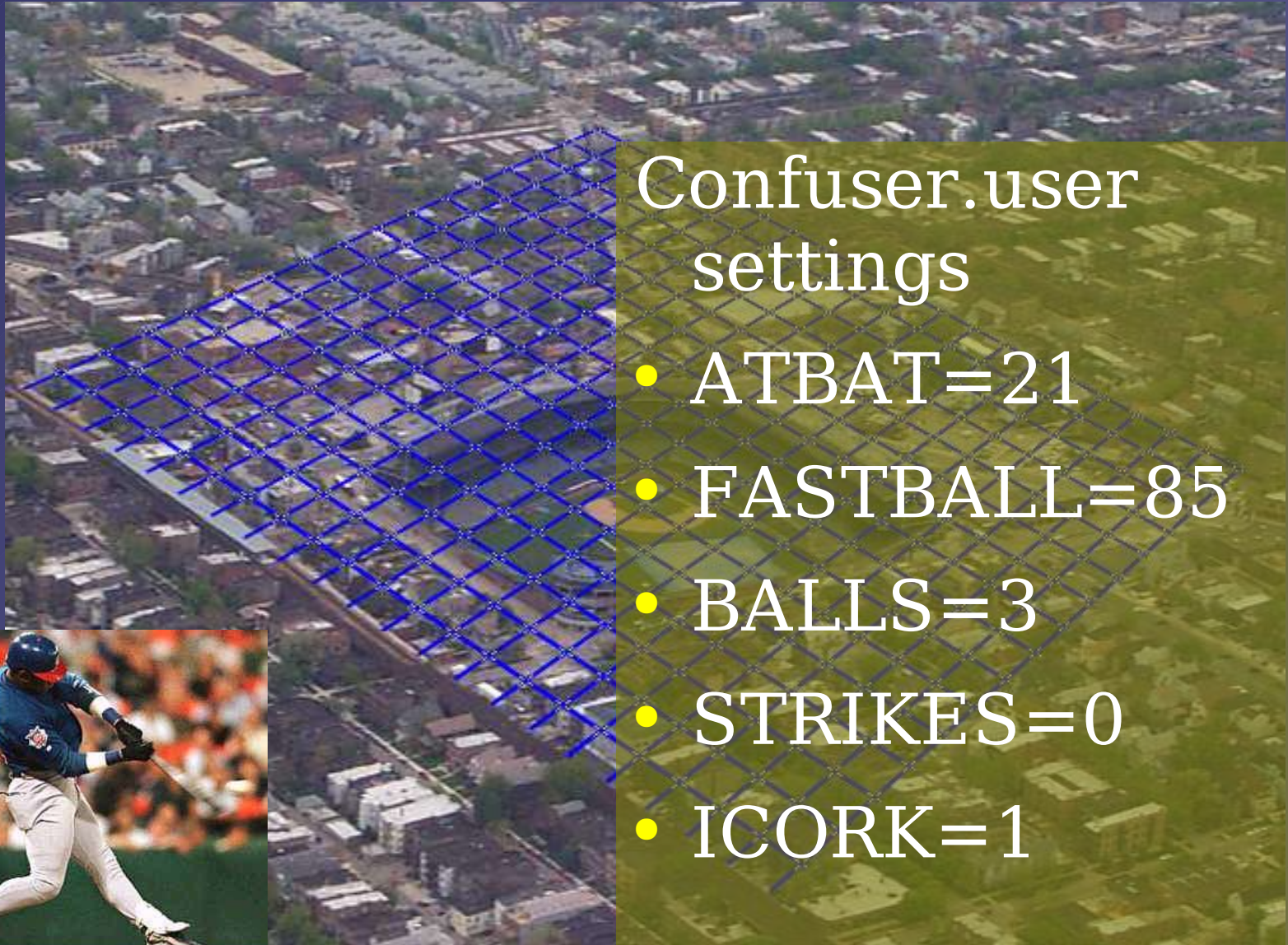
~~The Iowa Environmental Mesonet: Year 2~~

IEM: Shock & Awe

Daryl Herzmann
Dr Ray Arritt
Department of Agronomy



Baseball Modeling with MM5



Confuser.user
settings

- ATBAT=21
- FASTBALL=85
- BALLS=3
- STRIKES=0
- ICORK=1

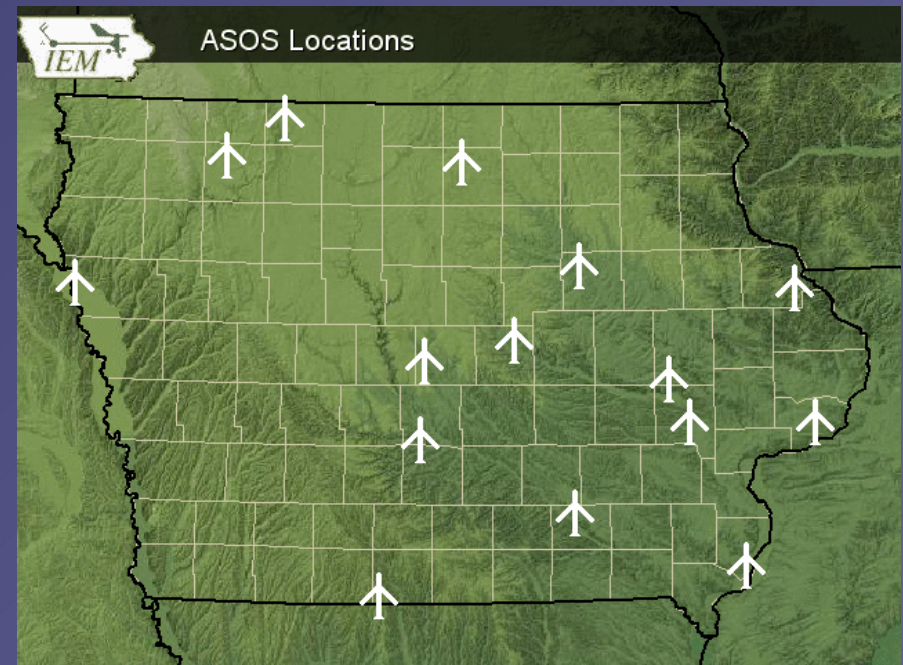


Outline:

- Component network status
- Data archive / website stats
- IEM Evangelism
- IEM Applications
 - Iowa Soil Erosion Project
- Conclusions/ No Questions

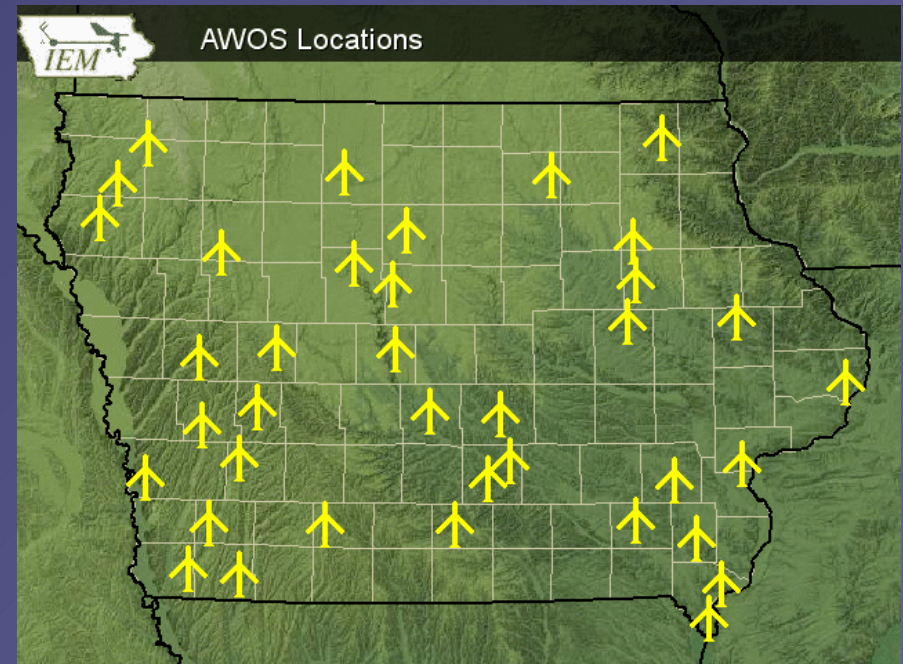
ASOS - Automated Surface Observing System

- Sites
 - 15 +2
(CWI+FOD)
- Location
 - Primary Airports
- Purpose
 - Support aviation



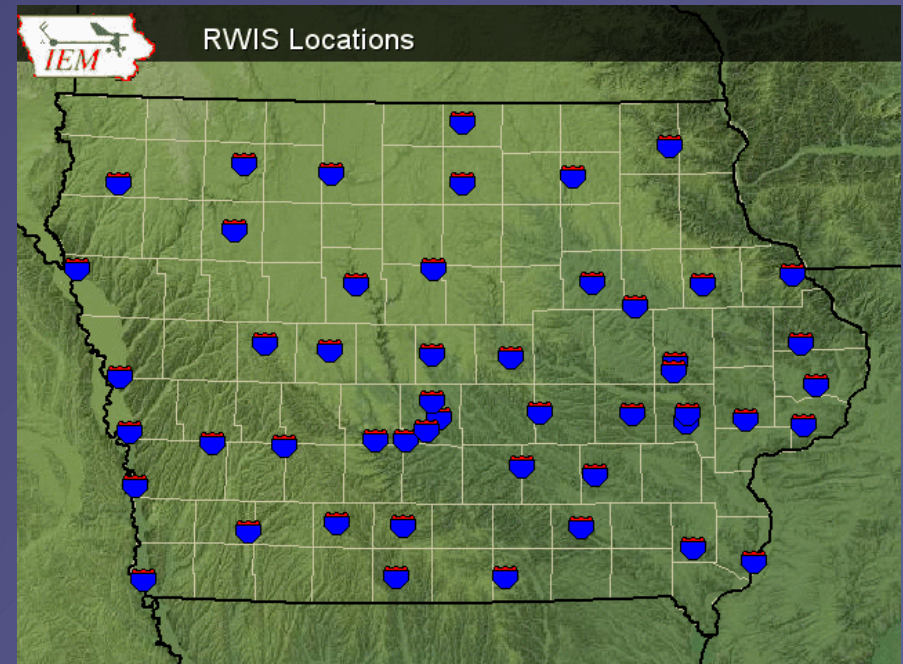
AWOS – Automated Weather Observing System

- Sites
 - 35 +2
(CWI+FOD)
- Location
 - Smaller Airports
- Purpose
 - Support aviation



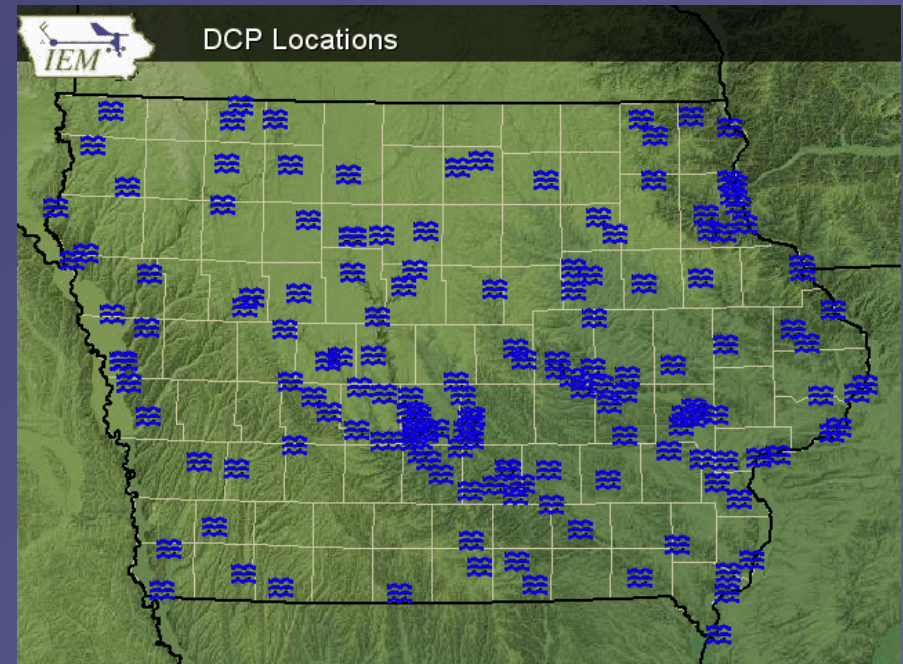
RWIS – Roadway Weather Information System

- Sites
 - 49 Online
- Location
 - Along major roads near bridges
- Purpose
 - Road maintenance support in winter



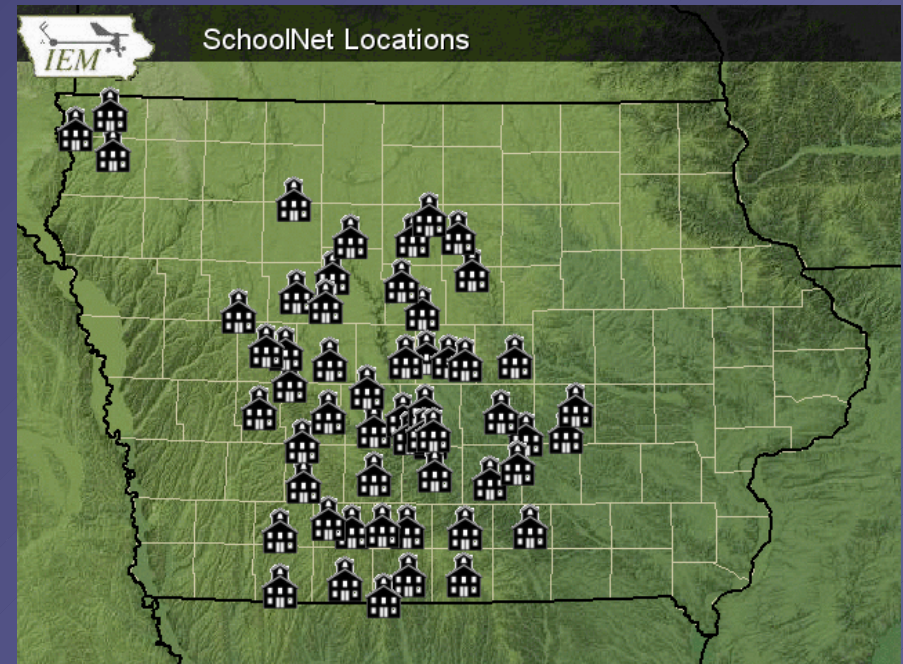
DCP – Data Collection Platforms

- Sites
 - 161
- Location
 - Along rivers
- Purpose
 - Monitor river stages



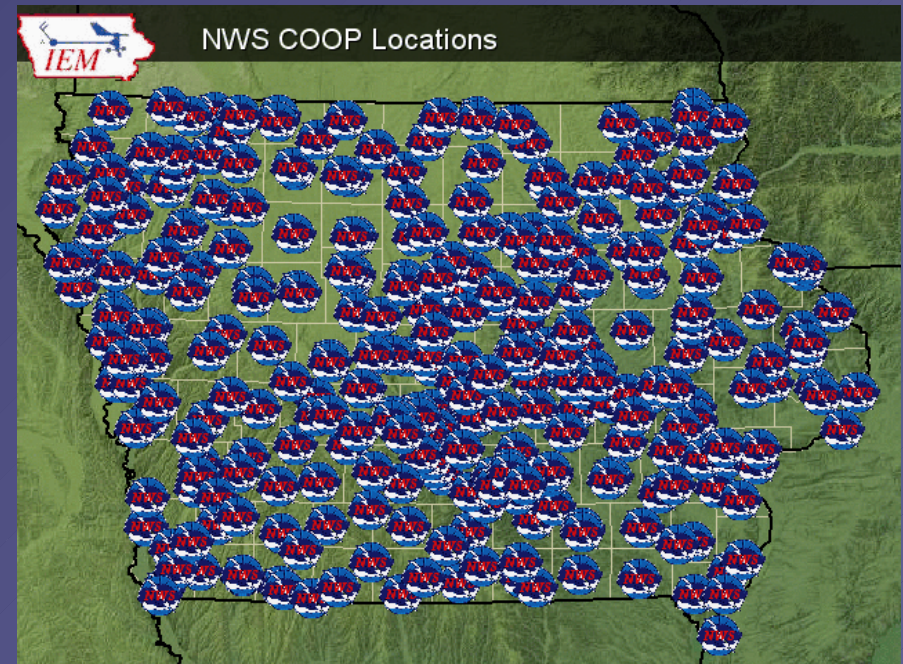
SchoolNet (KCCI-TV & KELO-TV)

- Sites in Iowa
 - 55 (84 total)
- Locations
 - Roofs of schools
- Purpose
 - **Support local science curriculum**



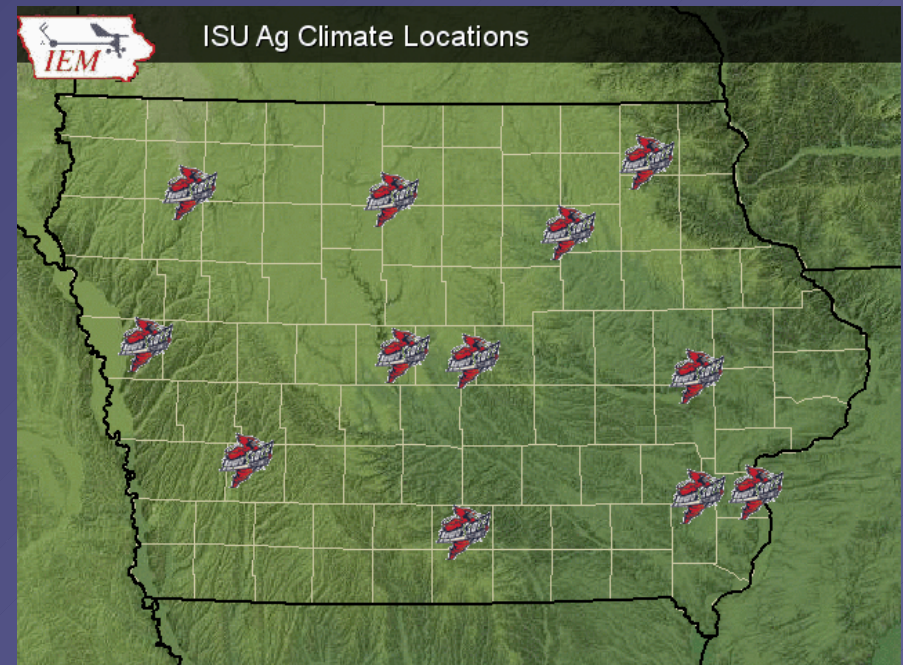
NWS COOP – Cooperative Observing Program

- Sites
 - 145
- Locations
 - Backyards, fields, about anywhere
- Purpose
 - Climate and hydro monitoring



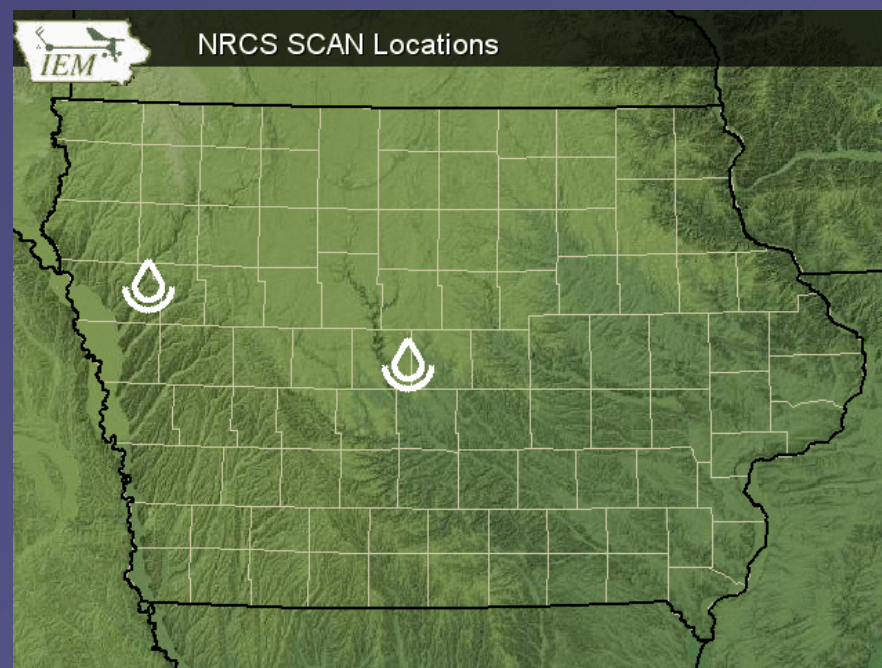
ISU Ag Climate Network

- Sites
 - 12
- Location
 - Open areas near research farms
- Purpose
 - Support Ag activities at the farms



SCAN – Soil Climate Analysis Network

- Sites in Iowa
 - 2
- Location
 - Fields
- Purpose
 - Monitor soil conditions





The Iowa Environmental Mesonet



Data Processed Daily

<i>Network</i>	<i># of Sites</i>	<i>Obs/Site/Day</i>	<i>Obs/Day</i>	<i>Obs/Year</i>
ASOS	15	24	360	131,400
AWOS	37	1,440	53,280	19,447,200
IA NWS COOP	145	1	145	52,925
DCP	161	48	7,728	2,820,720
ISU AgClimate	12	24	288	105,120
RWIS	49	144	7,056	2,575,440
SCAN	2	24	48	17,520
IA SchoolNet	55	1,440	79,200	28,908,000
Misc/Other/RAWS	3	24	72	26,280
Non-Iowa SchoolNet	29	1,440	41,760	15,242,400
Non-Iowa ASOS	300	24	7,200	2,628,000
	<u>808</u>		<u>197,137</u>	<u>71,955,005</u>

Website Access Stats

	Average	Maximum
Visits per day	500	3,500
Hits per day	65,000	750,000
Megabytes transferred per day	800	2,500
Pure Data Downloads / day	50	100

Website stats are misleading!

- What does Google say?
 - “Iowa Weather Data” (Top10)
 - “Iowa ASOS” (Top10)
 - “Iowa Historical Data” (Top10)
 - “GIS RADAR” (Top10, only .edu site)
 - “GIS RADAR WMS” (Number 1)

IEM Evangelism



21 Oct 02: NWA Conference



- Dallas, TX
- IEM/KCCI/NWS partnership presented the Larry R. Johnson Award

20 Nov 02: ISU GIS Day

- Ames, IA
- Keynote address
- IEM Poster won best-of-class
- Talked about data sharing, web services, and partnerships



11 Feb 03: AMS Conference



- Long Beach, CA
- Presented at the first GIS session of the IIPS
- Very successful session of IIPS and will have another in '04

18 Feb 03: CIPCO Training

- Des Moines, IA
- Presented at a training conference for teachers at schools in the KCCI SchoolNet8



14 May 03: EPA Region 7



- Kansas City
- Presented about the IEM at a regional air quality monitoring conference

6 Jun 03: Mapserver Users



- Minneapolis, MN
- First Users Meeting
- Presented poster on GIS RADAR
- Good delegation from Iowa State

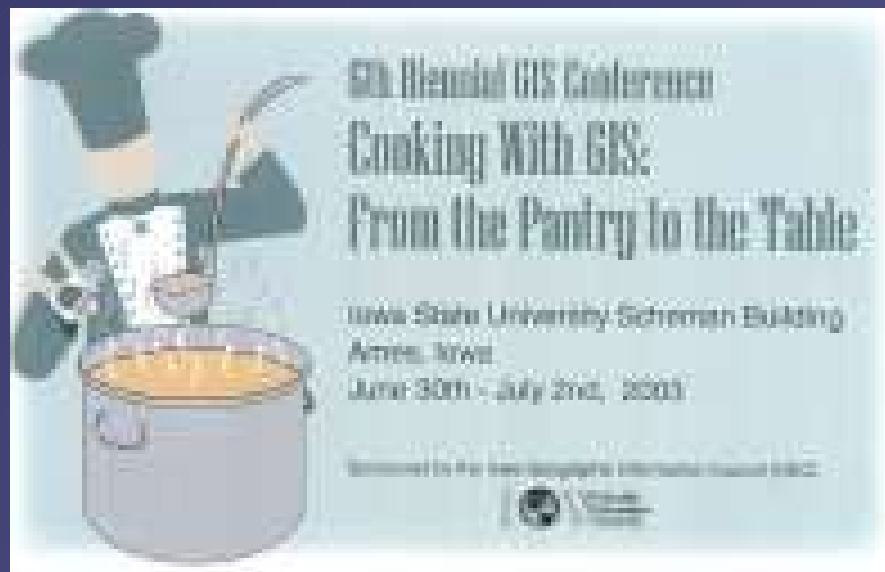
24 Jun 03: UNIDATA

- Boulder, CO
- Expanding Horizons Conference
- Presented about GIS & IEM



1 Jul 03: Iowa GIS Conference

- Ames, IA
- Presented about IEM & GIS
- Introduce the IEM-RadView effort to get RADAR data into GIS systems



17 Sept 03: Nevada School



- Nevada, IA
- Tips and tricks for utilizing the IEM – KCCI SchoolNet data.
- Good interaction for what the schools need.

27 Sept 03: Baron Services

- Huntsville, AL
- 'Supercharging' your school network
- Helped with RADAR case study for 23 Aug 2002.



Everyday communications

- IEM Daily Feature
 - Highlight something going with the IEM
 - Heavily QC'd by Dave Flory
- IEM Daily Bulletin
 - Daily email with network stats
 - News updates synced from the website

IEM Applications



IEM SchoolNet Website

Support your SchoolNet8 station by clicking on the banner.

LIVE SUPER DOPPLER SCHOOL NET 8 IN PARTNERSHIP WITH: Midland Power Cooperative

Home Current Conditions Charts/Plots Download Info Site Guide

Live SchoolNet8 Information for Jefferson Scranton HS

Latest WebCam Still Image:

Jefferson Scranton WebCam Mon Sep 22 13:45:05 CDT 2003
Internet service by: Jefferson Telephone Co.

Live Super Doppler8:
Jefferson Scranton HS

Current Temperatures @ 01:48 PM

Plot: Temperature Go

Done.

Real-Time School Net Information	
View:	Jefferson Scranton HS
Compare Station Go!	
-or- Select from map	
Station	Jefferson Scranton HS
Date/Time	Sep 22 01:47 PM
Temperature	60 F
Relative Humidity	73 %
Dew Point	51 F
Wind	WNW @ 8 mph
Pressure	29.955
Solar	270 W/m ²
Feels Like	58 F
Rain for the Day	00.00 in
Rain for the Month	01.72 in
High Temperature	63 F
Low Temperature	50 F
High Humidity	100 %
Low Humidity	70 %
High Pressure	29.97"
Low Pressure	29.91"
High Wind	NW @ 21 mph
Low Wind	0 mph
High Solar	1000 W/m ²

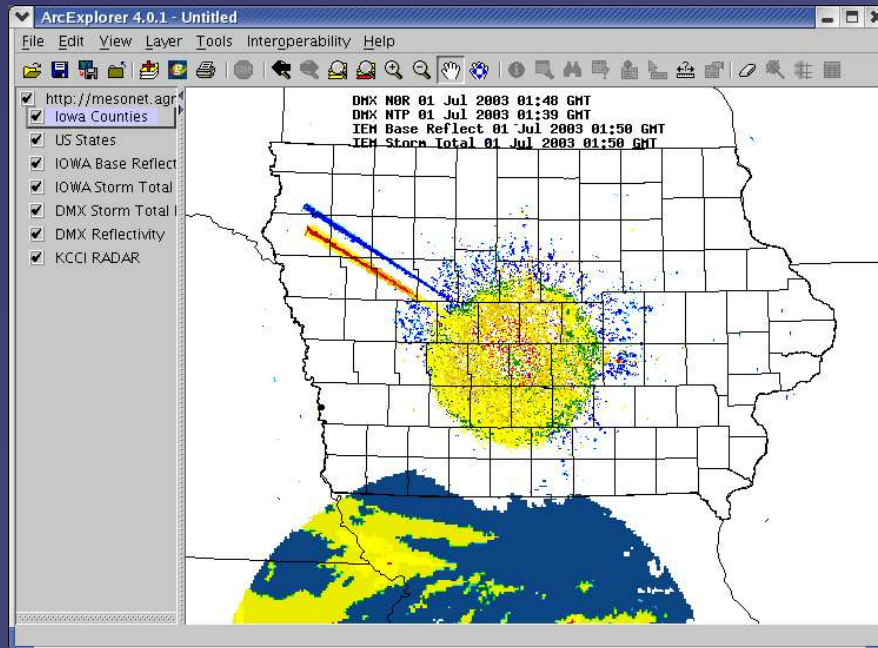
- Provides IEM visibility to 84 K-12 Schools
- Integrate obs + RADAR + camera
- Interaction with science teachers

About the IEM + SchoolNet

“Mesonet has allowed for the creation of partnerships between the local school districts, KCCI, CIPCO, and the local government to provide instant weather data for each of the name entities as they need. In return, the local community benefits from data provided and pride in seeing their local weather station on the news. As one person told me, 'This is the best advertisement this town has ever had.'”

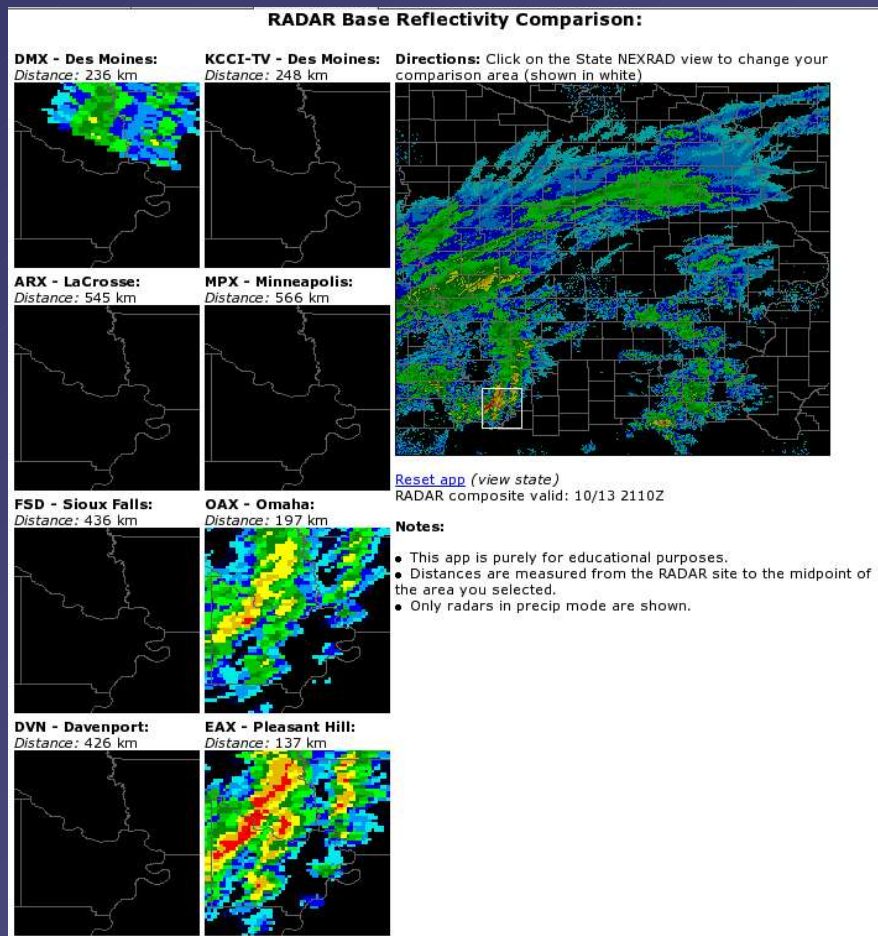
-Kelly Simpson, Science Teacher at Jefferson-Scranton

IEM RadView



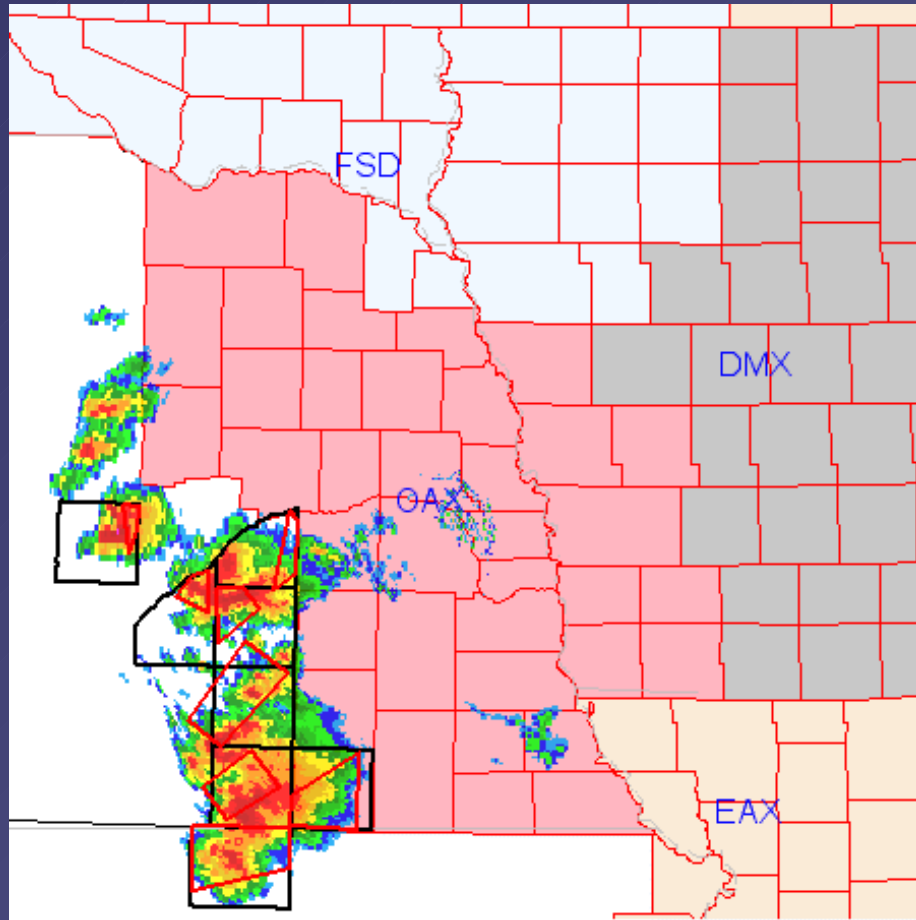
- Effort to provide real-time RADAR data into GIS
- First publicly accessible NEXRAD WMS
- Mapserver HOWTO

Iowa RADAR comparison



- Compare base reflectivity from the 8 RADARs we collect data from
- More GISish App
 - Click interface
 - Distance calculation
 - KCCI reprojected

NWS Warnings + NEXRAD

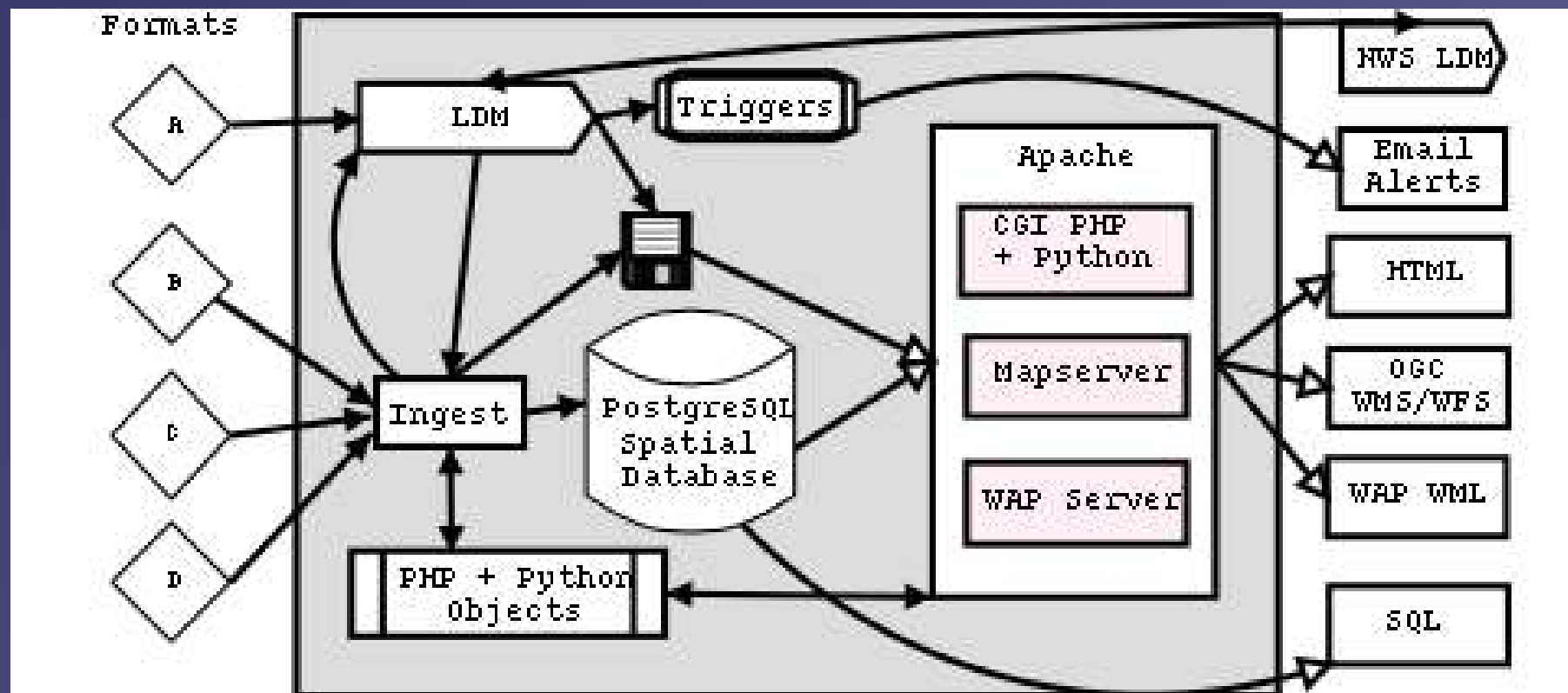


- Loop GIS layers to produce an interesting animation of warnings and NEXRAD product
- Works nationwide!

IEM Access, overview

- A relational **spatial** database storing obs from the IEM. Why a database?
 - NetCDF lacks concurrent IO (is coming)
 - Flat ASCII files are plain evil
 - Shapefiles aren't the right tool
- Database supports many frontends
- PostGIS, spatial blade, supports Open GIS Consortium (OGC) functions

IEM Access, data flow



IEM Access, applications

- Current Sortables
- OGC Web Map Service
- OGC SFSQL Service
- Unified data structure leads to rapid application development
- More to come, stay tuned...



IEM Tracker

- 7,700 trouble tickets have been generated since June 2002.
- All data outages documented.
- Very helpful for the SchoolNets
- Need to make tickets more visible on the website.

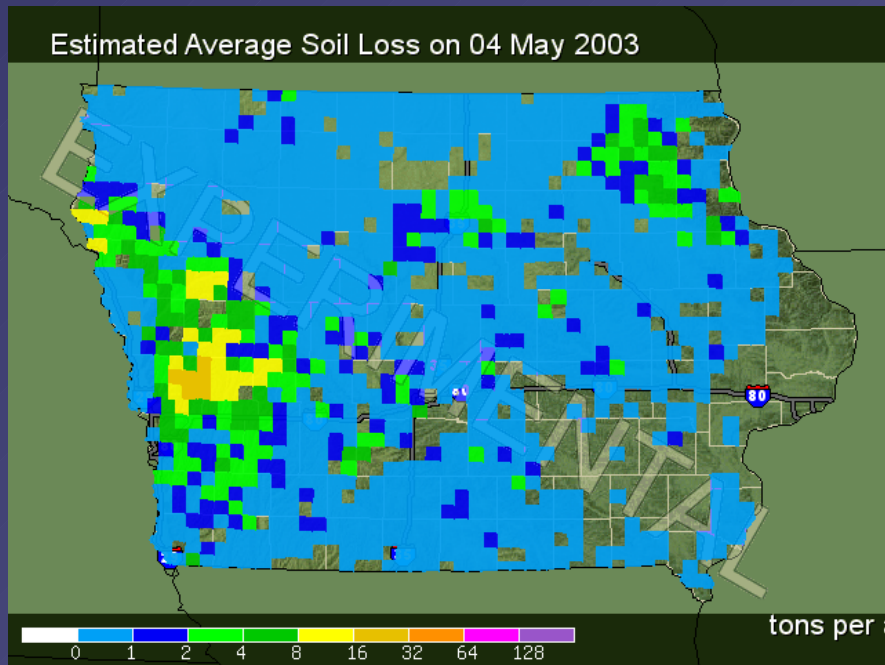
IEM Tracker

© Image by: Dave Flory



Iowa Soil Erosion Project

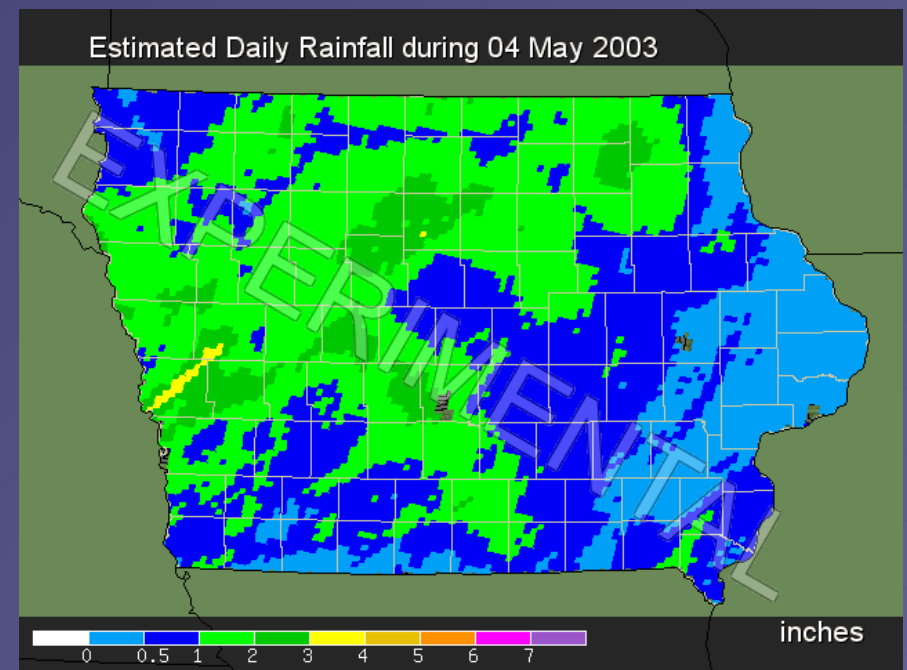
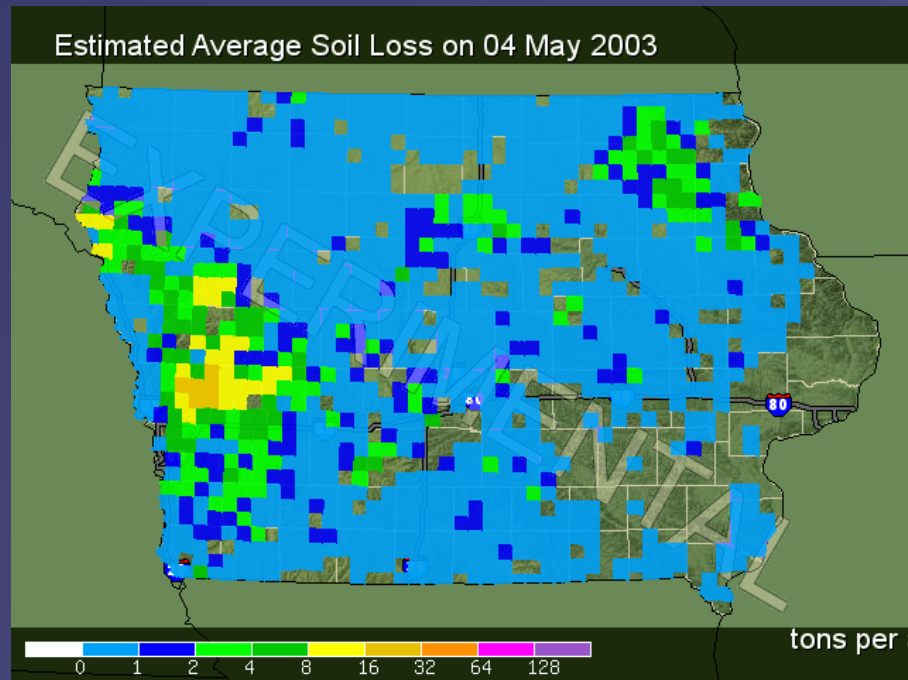
- PI: Dr Rick Cruse
- Agronomy Endowment Project
- IEM infrastructure makes this project possible



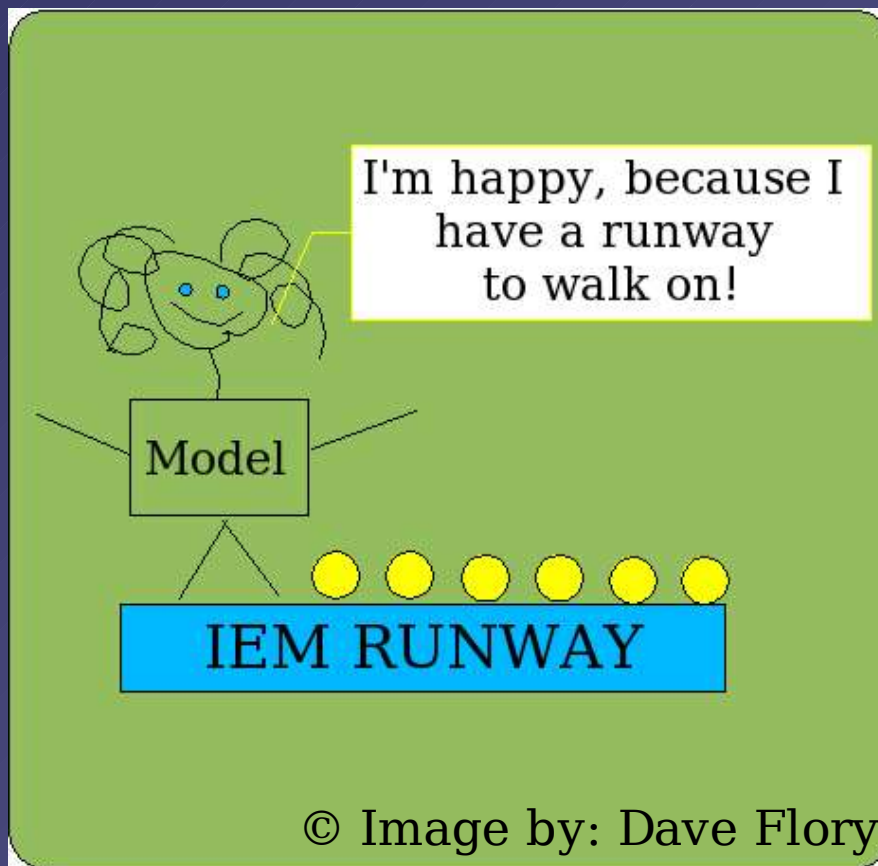
Erosion Project Ingredients

- National Resources Inventory (NRI)
 - Provides detailed information on soils, crops, and management practices
- Rainfall data from IIHR @ U of Iowa
 - 15 minute ~4km resolution
- IEM provides climate summary data
- WEPP Soil Erosion Model

Outputs



Introducing, IEM Runway



- Pre-compiled datasets ready for modeling.
- Integrate multiple data sources to produce the best analysis for modeling.

Okay, the Shock & Awe Part



I'm done, questions?



Daryl Herzmann

3010 Agronomy

294-5978

akrherz@iastate.edu