EMP3, a demonstration of decision support system components

presented by Paul Schultz
lead developer Paula McCaslin
OAR Global Systems Laboratory ☺

Decision support based on cost vs loss

- Risk management
- Goal is to enable objective decision-making
  - Requirements:
    - Well-analyzed costs and losses
      - Sounds simple, isn't
    - Quantitative estimates of forecast uncertainty
      - Sounds complicated, isn't
  - Expected outcomes:
    - Lower costs, lower losses attributable to decision errors

C/L decision example

- Concrete contractor is scheduled to pour on a cold night
- It costs $1000 to reschedule
- If the concrete freezes, the loss will be $3000 (to re-do the job)
- The C/L ratio is $1000/$3000, or 33%
- The probability of conditions that are cold enough long enough to ruin the concrete is 40%
- 40% > 33% … decision: *reschedule*

EMP3

Raw SREF grids

Ens rel freq used as proxy for probability

Javascript / Google Earth

User enters C/L, or GUI prompts for estimates

demo

Data accessors

- EMP3: cron job reads ftp GRIB, maintains MySQL database for performance
- Utopia: get needed grids from the 4D-Cube

Reporters

- EMP3: return SREF ensemble relative freq
- Next: return probabilities from EKDMOS or NAEFS
- Utopia: web service delivery (e.g. NNEW)

Displays

- EMP3: Google Earth; DS GUI and logic in Javascript
- Utopia: options for pros to see ensemble forecasts
- AWIPS II?

Decision logic

- EMP3: simplest imaginable application of C/L
- Next: practical applications *within NWS*
  - IMET support, emergency management … NextGen??
  - *NOT pouring concrete or treating icy roads!*
    - Private sector concerns
    - Policy (Ed Johnson)
- Utopia: United Airlines, ConEd, ConAgra, and GoldmanSachs make lots and lots of moolah!

Next

- GSD DDF project to demonstrate applications
  - Social science
  - Face down C/L quantification difficulties
  - Practical decision support tool for … somebody
- Interface to NNEW / 4D-Cube
  - EKDMOS, NAEFS for probabilities
  - NAEFS (NUOPC) for ensemble forecasts