Unidata’s Past

A Retrospective on Unidata at 20

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Artifact of an Earlier Historian

From a (35mm) presentation by Fulker, circa ‘88
This Time (for Maximum Educational Impact)

An Anthropomorphic Account

- Birth certificate
  - Madison, Wisconsin, 1983
  - Witnesses: Workshop attendees (incl. several of us here today)
- Unidata at age 20
  - Too old to cry
  - Old enough to drive & vote
  - Too young to drink
  - Hormones active
- But (in the spirit of the current political climate), I begin my story some time before birth...

History will be kind to me for I intend to write it.
-- Winston Churchill
Gleam-in-the-Eye Phase

- ‘83 Madison Workshop was not the seminal event
- Some fatherly figures (courting as early as late 1970’s):
  - Verner Suomi (Wisc)
  - Dick Greenfield (NSF)
  - Tom Vonder Haar (Colo St)
  - John Dutton (Penn St)

Also: Doug Sargeant (National Weather Service), Stan Ruttenberg (UCAR) ...
Giving Birth (Madison, ‘83)

- Many fathers
- No apparent mother (NSF?)
- Baby welcomed by over 80 university representatives
- Mandate to UCAR: proceed as laid out in plan by Dutton et al

**UNIDATA**

The University Data System

John Dutton et al

- A broad menu of weather data, including satellite imagery
- Local interactive analysis
- Communication to central mainframes
- Interactive operation of field programs
The Terrible 2s

- A failed proposal to NSF
- Working groups wrote reports in parallel
  - Local Hardware/Software Systems (LOHSS)
  - Networking and Communications
  - Data Management
- Misunderstanding with NASA about intellectual property rights vis-a-vis use of GEMPAK

Data Management Working Group
Networking and Communications Working Group
LOHSS
Local Hardware and Software Systems Working Group
Ernie Agee et al
Listening to Stories at 3

- First tangible result of the Unidata effort:
  - Contract with Zephyr
  - Discounted rates for universities to receive data (direct satellite broadcast)
- Very few computers; most users receive only facsimile “data” (no processing)
Cute and Engaging at 4

- Beta-test users of a PC version of the larger “McIDAS” software from U of Wisconsin-Madison
- Data delivery via satellite broadcast
- Called the McBE committee: McIDAS Broadcast Experiment
Early Socialization at 5

Attendees of 1st Unidata Users Workshop (‘88)
“Community support” (GEMBUD) for GEMPAK users
Entering College(!) at 6

Unidata on the Campus

From a (35mm) presentation by Fulker, circa ‘89
Applications include WXP, donated by Purdue
Performing a Play for Parents at 7

Unidata at AMS Annual Meeting, circa ‘90
Learning to Multitask at 8

Same staff member—T. Yoksas—also sent to Australia (the LAN down under)
Unidata at AMS Annual Meeting, circa ‘92. Precursor to IDD—called SDM & reflecting design by Glenn Davis (far right)—begins to have prominence, along with GEMPAK.
Wondering How I’ll Treat the Teen Years?

- Experimentation?
  - Show me your data, I’ll show you mine
- Rebellion?
  - Staying out all night with computers
- Identity?
  - Piercing walls with networks
- Answer:
  - I’ll get off this metaphor, even mid-stream...

Lest we take this too seriously:

History is merely a list of surprises. It can only prepare us to be surprised yet again.

– Kurt Vonnegut
Unidata: A Story of Remarkably Creative People

- Arenas of action
  - Colleges and universities
  - Unidata Program Center
  - NOAA, NASA...

- A few highlighted outcomes/impacts
  - McIDAS
  - GEMPAK
  - Radar data (full 88D)
  - Netcdf and related...
  - MetApps and IDV
  - WXP and Weather
  - LDM and IDD
  - Educational innovation
  - Unidata and the NWS
  - THREDDS and related...
McIDAS Software

- First met software widely used in universities
- Enabled first uses of satellite data for many
- Very rich functionally; sets standard for others
- Compatible with very low-cost computers
- Supports many Web sites; still advancing, with remote data access...

A few of the key players
- Verne Suomi
- Bob Fox
- Tom Yoksas
- Tom Whittaker
- Many others at SSEC
- Numerous creative users...
WXP and Weather Software

- Completely community-developed (near zero Unidata funds...)
- First Unidata applications to run under Unix
- Considered easy and quick to learn (by students and others)
- Source was available for customized applications

A few of the key players
- Dan Vietor
- Ernie Agee
- Peter Neilley
- Many innovative users...
GEMPAK Software

- Accurate (well trusted) and elegant software, matched to the thinking of meteorologists
- Easily adapted to meet complex scientific and educational needs
- Popular at intersection of NWS-university interests
- Now most widely used Unidata analysis package

A few of the key players
- Mary desJardins
- Steve Chiswell
- Peggy Bruehl
- Louis Uccellini
- Dick Greenfield
- Many innovative users...
Local Data Manager (LDM) Software and Internet Data Distribution (IDD)

- One of largest *distributed* applications—put met depts. on leading edge of Internet use
- Profoundly changed how universities acquire and use (real-time) data
- Lowered costs *and* increased reliability
- Ubiquitous in met depts; gaining use in NWS

A few of the key players
- Glenn Davis
- Russ Rew
- Ben Domenico
- Steve Chiswell
- Linda Miller
- Harry Edmon
- Anne Wilson
- Robb Kambic
- Jeff Weber
- Steve Emmerson
- Tom Yoksas
- FSL developers
- Countless LDM operators
Radar Data (Full 88D)

- Collaborative effort among groups with complementary strengths/interests
- LDM/IDD yielded faster, more reliable access ⇒ important research...
- Methods under adoption by NCDC and NWS
- Sets stage for distributed, regional forecasting...

A few of the key players
- Harry Edmon
- Russ Rew
- Linda Miller
- Kelvin Droegemeier
- Others at OK U
- Numerous NWS planners/developers
Educational Innovation

- Large increase in number of students (esp. non-science majors) studying meteorology
- Large increase in number of students working with actual data (i.e., leading the transition to inquiry-based learning)
- Served as model for and helped stimulate DLESE

A few of the key players
- Policy Committee, esp. chairs Bob Fox, Otis Brown, & John Merrill
- Users Committee, esp. chairs Chuck Wash, Mohan Ramamurthy, Jennie Moody, & Rich Clark
- All Program Committees for Users Workshops

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*I am always doing what I cannot do yet, in order to learn how to do it.*

- Vincent Van Gogh
Netcdf and Related Software...

- Stable, multi-platform, multi-language data access since 1988
- Google shows 147,000 hits for “netcdf”
- Over 2000 downloads (in 55 countries) since ‘97
- Over 50 software pkgs employ netcdf access

A few of the key players
- Russ Rew
- Glenn Davis
- John Caron
- Steve Emmerson
- LLoyd Treinish
- Charlie Zender
- Harvey Davies
- Many other developers, all around the world
Unidata and the NWS

- University-NWS relations hit a low point when Unidata was launched (data-flow changes...)
- Now greatly improved
- Working together well on CRAFT & 88D access
- Netcdf & LDM software being used by NWS
- Successful case-study project no longer funded

A few of the key players
- Doug Sargeant
- Sandy MacDonald
- Kelvin Droegemeier
- Linda Miller
- Ethan Davis
- Jeff Weber
- Russ Rew
- Tim Spangler
- FSL and GEMPAK teams
- Universities co-located with NWS Offices
Some of our greatest risk-taking has been to put a stake in the ground for Unidata software in Java.

Presentations by other speakers should give indications as to whether the risk was worthwhile.

In any case, the creativity has been extraordinary!

A few of the key players:
- Don Murray
- Bill Hibbard
- Jeff McWhirter
- Stuart Weir
- Charlie Murphy and other members of the MetApps Task Force
- Various VisAD users
THREDDS and Related...

- Unidata’s most recent past has evidenced substantial departure from earlier patterns:
  - Retrospective as well as real-time data, especially via the DODS and ADDE access methods
  - Connecting with non-atmospheric communities
- Fortunately for me, these efforts are related to digital libraries...

A few of the key players
- Ben Domenico
- John Caron
- Ethan Davis
- Linda Miller
- DODS team
- Collaborators at partner sites
Conclusion

- Great appreciation to administrators, writers, and others whose names were not in this history: *your work may be less visible but it is no less valuable*

- Equally great appreciation to Cliff Jacobs and the NSF for the opportunities: *your counsel and support have been crucial throughout the Unidata history*

- Special thanks to those to whom I have reported, most especially: *Bill Curtis and Rick Anthes*

*Most of all, perhaps, we need an intimate knowledge of the past. Not that the past has anything magical about it, but we cannot study the future.*

- C.S. Lewis