

AASC Aug 5-8, 2001 Meeting at Omaha, NE

Al Dutcher (SC-NE) talked about the climate of Nebraska. Seasonal extremes are normal. Precipitation ranges from 30+ in SE to low teens in NW. Other details and many pictures were given. (Showed a canoe on river and commented that all river access is private.)

\* Send a 'work plan' to Steve Hilberg and he will get an MCC 'letter -of-approval' out right away.

Mary Glackin (Asst. Admin for NESDIS-NOAA) talked about 'Delivering High Quality Climate Services: NOAA Climate Observations and Services Management Structure'. She described the NOAA/Assistant Administrator/[NWS|OAR|NESDIS] structure which included 'Science Advisory Boards' such as the 'council for long-term' monitoring' and the 'ocean observation panel'. She talked about enabling climate observations and services. The transformation of data into information through modeling, diagnosis and analysis, and applied research was described. Under the heading of 'Climate Services Foundations' she listed the priorities of monitoring and observations, research, and services as the observing system strategic priorities. Christy (SC-AL) asked where does the NOAA/NWS boundary exist (who does what)? Another question asked about precipitation predictability to which Tom Karl indicated that initial workshops would be held in Canada. Phil Pasteris (NRCS) asked 'what is the climate in Congress for funding?' which was answered 'pretty good'; a major initiative was planned for 2003. When asked about linkages with other Federal agencies, a role of leadership was mentioned.

Tom Karl (director, NCDC) gave a general 'status report'. Under the banner 'national integrated services' he mentioned reducing regional climate risks, enhancing regional climate resources, and an RCC/SC/NOAA-NCDC cooperation. The regional climate resources include impacts at regional, national, and local levels; better access to non-NOAA data; applied research to create new climate tools, information, and products; contemporary climate services responsive to regional needs; and the building of interactive customer relationships. He also talked about new and past faces in NCDC. The 50 year anniversary will be commemorated Oct 1-5, 2001. He also expressed intent to establish AASC recognized SCO (ARSCO) in all 50 states and Puerto Rico. In more applied matters, he mentioned that online orders were up 37% since FY00 and are now 60% of all orders. Level 2 radar data is now coming in on a real-time basis from about 20 sites (mostly in southern 1/2 of U.S.) The digital archive has reached 1 pedabyte (1000 terabytes). A list of new products to be available in the next 6 months was given as new versions of GHCN, Global daily T & P, global satellite temperature (1988-), global sea surface temperature (late 19<sup>th</sup> cent -), integrated surface hourly, US HCN. Other products were briefly mentioned for later release, including new divisional data. Under 'climate monitoring', population-weighted indices were being revisited. (Al Dutcher made a comment about 'population-weighted drought'. I believe to emphasis that not too many people live where the densest corn grows.) Under 'science', Tom mentioned involvements with IPCC, the National Assessment, the Academy of Science and the 'Science of Climate Change', and 20 miscellaneous papers. 'New Normals (1971-2000)' were also discussed. By 8/31/2001 daily and monthly digital data will be ready. By 9/30/2001 the PDF documents will be available and by 9/31/2001 other supplemental materials will be finished. Temperature

homogenizations with now use the GHCN technique (instead of the USHCN technique). Missing value estimation has been improved. A 'modified THOM method' will use monthly temperatures and standard deviations for degree day calculations since no technique has been established to correct daily temperatures for time-of-observation biases.

John Jensen (NCDC) talked about the 'US Climate Reference Network (CRN)'. He indicated that accuracy and fidelity of climate data are crucial to long term monitoring and the U.S. economy and included a cite of the U.S. NRC paper 'Adequacy of the Climate Observing System' among others. The NRC recommends the strengthening and revitalizing of Federal partnerships, etc. Data quality and homogeneity issues add uncertainty to data. 50 years from now want a more certain assessment of the climate. Density and sensor types are issues in establishing a national benchmark climate network. Ultimately 250 stations are planned. A density study is to be completed in September. It is planned that stations will be located at locations sensitive to climate change and near stations having long-term historical records (e.g. USHCN sites). Site selection will aim to minimize potential impacts from long-term land use/cover changes. The stations will be redundant in order to detect instrument drift or other changes. The data will be available in near real-time' at no cost via 'the web'. The network will be a part of GCOS and CLIMAT and produce daily and monthly summaries. Site selection will consider major climate regions, Federal/national parks, state lands, universities, closeness to USHCN sites, the possibility of collocating with existing Federal networks, WMO guidelines, and site quality classification (1-8). A site license agreement will allow CRN personnel access and provide for AC power, some site maintenance, other miscellaneous details. In the next 7 months, in a 'pre-deployment' phase, equipment will be acquired and deployed at 25 paired sites for testing. The validation phase will require additional months. After stations are installed they must have field maintenance at least yearly which will be provide initially by [? I am not sure of who, JAZ ] the 'air turbulence unit' and later by a not specified entity but NWS seems likely. Periodic replacement of sensors is also required. Performance monitoring will be accomplished mostly through comparison between paired sites. Data applications will include climate trends, climate change, and real-time operations. A research component will continue with ongoing funding. Future developments could include other instruments such as soil moisture. Also in the future CRN might be used to adjust or validate remote sensing observing systems such as satellite or radar. In 2001 25 initial stations will be deployed, the spatial density study will be completed, a decision on what type of rain gage wind shield will be deployed, and future sites will be identified. Many opportunities exist for RCCs and SCs.

\*MSP area dot shown on map of 1<sup>st</sup> 25 stations – Steve Hilberg of MCC will call.

Steve Doty (NCDC – Program Manager for Database Modernization) talked about making data more accessible. \$15M available in FY01 was mostly spent in data preparation shops in KY and WV. Paper records now go to London, KY shop where they are keyed with 24 hours. The CD will be back on schedule soon. The subscription service has moved to Rocket Center, WV. Up to 30 million images will be available online in the 'Web Search, Store, and Display' (WSSRD) system. Many data sets were briefly described. Hourly data from 600 stations for 1850-1941 from microfilm were digitized. Daily COOP data from

the 1890-1947 for the 48 conterminous states are now digitized with QC done. The surface airways hourly images for 1949 to present are now available via web and are well indexed. COOP forms since 1995 have been imaged. All historical Climatological Data, LCD, Storm Data, and other serial publications have been imaged. Climate record books (since 1860s) have been keyed from microfilm images. The station history data base is being redone (by Jan 02) and will include NWS CSSA system automatic ingest. Surface airways from 1990-48 and 1965-81 (to fill-in missing 3 hourly) and metadata will be keyed. Fort data from 1850-1890s for selected stations together with metadata will be keyed in conjunction with MWRCC. Circulars and Federal Meteorological Handbooks representing the history of observing rules and other information will be imaged. 1980-1994 COOP data forms will be imaged. The entire 700,000 page COOP 1940s-2000 station history file will be imaged. In the future images may be made of COOP forms from the beginning to 1979, upper air obs from 1900-1948, and Forts data from NARA (also keyed). A new digital inventory is also planned. Steve announced the availability of WSSRD to SCs. Currently COOP forms for 1995-present, surface airways 1949-present, and climate record books are available.

- \* For selection is being done at MWRCC.
- \* Kathy: circulars online.
- \* WSSRD online

Mark Schaffer (Associate member) talked about the need to integrate SC needs with national organizations. He is creating a document for AASC that states abilities and needs of the organization.

A lunchtime demo of WSSRD was available.

Steve Hu (Associate member and former SC from MO) talked about 'ENSO and rainfall in Central U.S.' The relationship has been uncertain. He looked at 1960-90 and longer correlations of precipitation and sea surface temperatures. Correlation in mid-U.S. for 1960-90 is high even though none is found in longer term pattern. A time series of correlations shows multi-decade spells of high and low correlation. Jim O'Brien (SC-FL) commented that it looks like the Pacific Decadal Oscillation and so is related to northern Pacific behaviour.

Ken Crawford (SC-OK) talked about 'Oklahoma Mesonet – Climate Services to Citizens of Oklahoma'. He described the network of high frequency stations spaced 31 kilometers apart, the many parameters observed, and the many public, private, and educational users. First funded in 1991, they were already doing educational outreach in 1992. The Mesonet itself was commissioned in 1994. Public safety was emphasized. Economic developments such as wind energy fostered development. Microclimate/weather features were demonstrated by, for instance, short-term precipitation products to depict dry spells. Soil moisture daily products were added; the forestry-based Kietch-Byram drought index is used in a fire danger model. The Mesonet has started charging for data. Land-atmosphere interactions were demonstrated: e.g. 'land breezes' forcings over winter wheat areas. 'Heat bursts' could be shown from localized areas of strong divergence/local sinking.

Mark Svoboda (National Drought Mitigation Center at UN-Lincoln) talked about 'The Status of Drought Monitoring and Policy in 2001'. He indicated that 'flash droughts' can occur; soil moisture for the last 6-7 weeks have shown fast changes from a surplus to a strong deficit. He indicated the intent of the 'Drought Monitor' is to emphasize the spatial extent and probability of an event. He stated the strong dependence of the product on state and regional guidance. An 'objective blend' of various drought products that would have both short term and long term characteristics and be given a in a percentile format was described. He talked about recent relief in the SE but that the NW drought is expected to continue. He asks 'as la Nina fades away, what's next?'. He depicted the interconnections between the National Drought Policy Act and the National Drought Policy Commission and the National Drought Council. He mentioned that UCAN-based real-time weekly products were being developed. A Global Drought Preparedness Network, a 'net of regional networks', is being developed. An 'intro' paper about the 'Drought Monitor' has been submitted to BAMS. Contributors to 'Drought Monitor' products are welcome. Still looking for better drought classification methods.

Phil Pasteris (NRCS) talked about the 'UCAN Partnerships'. He described the partnership between the regional centers, NCDC, CPC, the Drought Mitigation Center, and UNIDATA (especially for standards). He emphasized that climate is more than just observations. UCAN will make climate data available to a broad user community, tailor products to user needs, provide a flexible interface to satisfy programmatic needs, and integrate resources across agencies. UCAN is a distributed data archive fully described by metadata with network access via redundant paths and near-real-time updates to archives. Some features include standardized products, analyses based on scientific principles, and modular product design. An API for web access to data is at the core of the design. The data format follows UNIDATA's netCDF specification. Many NDCCD 'tape format' data sets are represented: TD 3200 (daily), 3220 (monthly), 3240 (hourly), 9641 (normals), 3280 (airways). Products, including graphical, are numerous.

\* email MapServ info to RCC/UCAN folks.

Steve Hilberg (director, Midwest RCC) spoke for all the RCCs. Among many other details under 'administrivia' he indicated that Art DeGaetano had taken over as director in place of retired Warren Knapp. The 6 centers had \$2.9M for FY ending 6/30/01. FY02 still in process - \$3.6M was being considered in Senate. A climate initiative was being worked on. Many innovations were exhibited under the banner of 'data acquisition/products'. \* For the midwest upper-air soundings archive for 46-97 is now online with a graphics interface. Also mentioned were a hail data base for the US on CDROM and thunderstorm data for the US. Under the heading 'Climate Monitoring, Services, and Outreach' the numerous events such as droughts, hurricanes, fires, heavy snows, etc. were mentioned. Also highlighted were 'service trips' and lots of 'media features' where RCC supplied information was featured. On 'Research', Steve talked about climate data modernization, pre 1948 hourly data sets, the QC of pre-1948 daily COOP data (\* Ken Kunkel), CRN site selection and network design, and at the midwest center fog frequency studies, etc.

\* NWS local offices decide which COOP stations appear in CD (e.g. 'blank' snow sites)

A discussion about membership led by George Taylor (SC-OR) with speakers Roger Pielke (SC-CO) and Jim Zandlo (SC-MN) opened to the membership after initial talking points were given. The merits of becoming an organization of climatologists generally with a certification program, maintaining a 'Federalist' structure, and including other 'service climatologists' as 'full' members were briefly highlighted, in turn. Discussion yielded no conclusions. The membership committee will continue to examine the issue.

Al Dutcher (SC-NE) talked about 'COOP data entry'. He indicated that there has been an 'explosion' of 'wet-side' precipitation by snow fall values being written in the precipitation column and coded as precipitation. He pointed out many similar problems.

\*Send message about 'all zeros except missing on non-zero precipitation days' being code for snowfall for forms on which snowfall column is entirely blank.

Banquet speaker talked about the 'History of Nebraska'.

\* on-line data entry: 'ROSA' (not called that) has no DB access for the user – messages (SHEF?) only

## BUSINESS MEETING

The minutes of the 2000 meeting were read.

Davids Stookesbury (Tres/Sec - GA) gave the treasurer's and secretary's reports. A permanent database of members is being established at the High Plains RCC with the help of Al Dutcher. At this time, don't adequately know who members are of if they've paid dues. Plan to publish minutes and announce next meeting in BAMS.

Jim Angel (Pres. - IL) gave the presidents report. He indicated that 15 states have completed the ARSCO requirements. He talked about AASC developing alliances with AMS, NASLGUC, Natural Hazards Caucus, and the weather derivatives industry. He indicated that the AASC has more political muscle that we realize. He cited a quote that 'All politics [and climate] are local' and continued that our local connections are invaluable and that we should pay more attention to the political process.

### Committee Reports.

Paul Waite for committee including Bill Mork (CA) and Hal Klieforth (NV) reported on the 'Arnold Court Award' recommendations. The proposed wording of the award was read. (Among the interesting details: the current form of the wind chill formula was done by Arnold.) A discussion ensued.

An Amos Eddy letter put together by Howard Johnson (Asst.SC - OK), Phil Pasteris (NRDC), and Pat Michaels (SC-VA) will be into a letter from the President.

### Membership Committee.

Steve Hilberg (dir. MWRCC) indicated that a new 'mission' for AASC is needed before changing membership. A motion to simply move ahead with a 'student' membership was made and withdrawn. A 'constitution committee' was formed [???who]. What is the AASC mission? What are member classes? Is voting by email/USmail OK? What about the one year voting delay provision? A vote-by-email resolution was passed. (If vote-by-email conflicts with the 'next meeting'/'one year' delay provision, THEN vote at next meeting on proposal to eliminate 'next meeting' provision.)

### Policy Statements.

George Taylor started the discussion by saying that the AASC needs a policy committee. A 'Governor's Liaison Committee' was proposed by Michaels (SC-VA). (As an aside, Pat indicated that the next National Assessment will be 'state based'. This will mean research dollars for local use. Impacts are desired, not climate per se. He guesstimates \$200K/state.)

The next meeting was confirmed to be in Anchorage. A brief discussion ensued about moving the meeting date. Also brought up was the possibility of co-meeting with the AMS Applied Climatology meeting (every other year). For the meeting after next, in 2003, Georgia ('only if before June 15'), Puerto Rico, and Oregon were suggested. Jim O'Brien (SC-FL)suggested that the members need to know more to decide. Time of year, costs, etc. will be presented later in the year on a web page for members' perusal and subsequent decision.

\* Get MN meeting info to Dwight.

The new president was chosen to be Roger Pielke (SC-CO).

New Associate members were nominated and elected.

The list-server has been moved to the University of Nebraska – Lincoln. Work is being done to enable mail attachments. NE will post the hosts of meetings. Currently looking for better name lists.

Jan Curtis (leaving Alaska Climate Center in Fairbanks) will be the Wyoming SC starting this fall.

The Business meeting was adjourned.

Phil Pasteris (NRCS) talked about the National Water and Climate Center. The Center provides water and climate services such as hydromet data collection, water science, etc. Lots of PRISM based (atlas) products are supplied. Interacts with the Federal Geographic Data Committee, especially the Spatial Climate subcommittee (see [www.wcc.nrcs.gov/fgdc/subcommittee](http://www.wcc.nrcs.gov/fgdc/subcommittee)). They do research and development on weather and storm generators which are now parameterized for 230 sites (see [www.wcc.nrcs.gov/models/gem/index.html](http://www.wcc.nrcs.gov/models/gem/index.html)). (\*) An article in JAM Aug 2000 describes a serially complete data set that includes deaccumulated precipitation. 'R' (soil erosion) and storm analyses studies have also been done. A soil climate analysis network (SCAN) with 49 sites and many parameters (one site shown in MN) was shown. The center continues to support climate services with UCAN.

Pat Michaels (SC-VA) talked about 'Global Warming: "Get over it"'. His talk included excerpts from his best selling book 'The Satanic Gases'. Pat presented evidence that warming is 'trapped' in cold anticyclones. He shows that only for the driest air masses (dewpoint 0C or less) does the temperature of the airmass increase with pressure (the other airmasses do not change temperature with pressure). Pat also discussed ocean warming trends. He points out that the thermal lag is apparently shorter than generally assumed so ultimate warming implied by ocean observations is reduced to 1.5C for CO<sub>2</sub>x2. Also discussed was that daily mortality actually decreases with apparent T and through time the number of deaths at high temperatures have been going down due to (apparently) increased use of air conditioning – i.e. people won't just stew in higher frequencies of high temperatures, they'll turn on the air (a technological fix). He also mentioned that the temperature of the Gulf of Mexico can't be raised enough to greatly increase the average dewpoint temperature. Pat pointed out that the US National Assessment actually choose the global climate models that exhibited the greatest temperature and precipitation changes. He also mentioned problems with the effects of sulfates in models. He went on to indicate the remaining variance after taking out modeled behaviour is greater than the initial variance. Pat closed with the idea that the National Assessment exhibits mal-practice by choosing models that do a bad job of depicting the actual climate.

Roger Pielke (SC-CO) talked about nocturnal global warming and other topics. Increases in growing season have been examined. Additional observation site information could/should be examined. For instance, urbanization will vary with biome, greenness, landscape, land use, etc. Radiative forcing changes are heavily affected by land use changes. Models have left out important first order effects. Climate models run from 1980 forward show more warming than has been observed. Arctic sea ice area actually seems to be increasing recently. Looking at actual ocean heat content trend, approx. 1.0 watt-m<sup>-2</sup>, demonstrates models' inability to model ocean heat content.

Jim O'Brien (SC-FL) talked on a few topics. He showed long term precipitation trends in Florida. He emphasized the importance of using a longer, even period-of-record time series to avoid overstating unusualness of shorter term variations. He showed accumulated precipitation which had been 'normalized' to average zero. He indicated that various multi-year effects may be 'coloring' the results on a 'too short' basis. On global warming, he asked 'what are local 'urbanization' effects?'. They may be different in different areas. On ENSO

effects, he stated that smart people don't understand probabilities but results presented as 'odds' of an event are better understood.

Bob Livezy (NWS Climate Services, Office of Climatic and Weather Services, NOAA-National Weather Service) talked about 'Delivering Climate Data and Prediction Services'. He mentioned some basic responsibilities such as climate 'long-lead' forecasts, real-time monitoring, model output (raw material that CPC uses from numerical forecasts), 'know how' that went into the models, and observations (ASOS, COOP, radiosonde). He talked about filling a stewardship role in regards to data and that they were the conscience of the NWS for the integrity of the record. He indicated that they develop policy/process for provision of climate services, identify customer requirements, and do 'care and feeding' by maintaining important links to infrastructure. They are partners with NESDIS and OAR. He said that all services except observations are produced at a national level but are applied at regional and local levels. In order for customers to drive NWS services, customer interactions were required to assess requirements and to educate the customer about product availability and the bases for forecasts. One such forum is the 'Risk Management Industry and NOAA Workshop'. He talked about mobilizing NWS field personnel (132 NWS FO) by providing training to develop climate services competency in each office, opening feedback channels to headquarters and CPC, and facilitating local partnerships for climate services. Training named the 'Professional Development Series' (with 'Professional Competency Units') is being developed (and web site designed) to help participants understand and better apply CPC data and products. The training will also develop the ability to respond to user requests for historical data and provide information to provide for public outreach. An 'Education and Outreach 2001 Visitor Program at NWS Headquarters and NCEP/CPC, Washington, D.C.' is an opportunity to establish better partnerships with local offices with someone else from a FO or RFC. Some shifts in elNino/laNina can produce 'astonishing' results in local weather – CPC can teach how to do such analyses.

Andy Horwitz (COOP program, NWS) talked about COOP modernization. Phase I (was called 'rescue') will 'prevent data loss'. MMTS spares will run out by Dec 01. FP at NCDC will fail in 2-3 years. A prototype study uses 24 FP and 100 MMTS replacements. \$6.9M is budgeted for FY 02-04 for 5000 temperature upgrades and data loggers. FP upgrade proposal time is past but prototypes are in-hand and are being deployed early in next FY to be followed by full deployment. In Phase II there will be many 'product' improvements. Drought and climate monitoring will improve by filling gaps and providing county-level data. Also flood forecasting will improve by improving precipitation estimates from radar. Daily reports from COOP are currently quite thin in the West. For temperature forecasts, want data other than just 1000 or so airport sites so that the forecast is more representative of surrounding areas. Temperature and precipitation gages will be deployed at new recommended densities and communicate data automatically on an hourly basis. 1000 sites will have soil moisture and other measurements. The program will be managed by the NWS Office of Services. The new instrumentation will be installed by contractors. HMTs and ETs in FOs will be involved in the automatic communications system. It is expected that the modernized system will result in decreased errors in the forecasts of Temperature and precipitation. Al Dutcher (SC-NE) asked about QC and was assured that it will be done. Jim Zandlo (SC-MN) asked about how it is insured that money earmarked for

COOP activities in the FOs is actually spent on COOP needs. He was told that they are looking into instituting a work-tracking plan to ensure that COOP money is spent properly.

Steve del Greco (NCDC) talked about the 'COOP Spacing Project'. GIS methodologies are being used to determine 'optimum' spacing for the modernized COOP stations. Some density requirements imposed are 1 site per 20x20 mile grid, 2 sites per NWS forecast zone, 40 sites per WSR-88D radar. Sites should also be co-located where practical with CRN, HCN, or Global Climate Observing System sites. The USDA desire for enhanced parameters also imposes a 60x60 mile grid requirement. In the GIS environment COOP, ASOS, HCN, and SCAN (Soil Climate Analysis Network), etc. can all be displayed. The report is due at the end of September. The results will include a GIS product for NWS FWOs to use for strategically placing observing locations (to fill gaps). Steve demonstrated the GIS environment by showing the project in ArcView.

\* Steve uses SURFER to get Laplacian field to detect 5 degree variations.

A DTN talk failed to take place because of network failure.

Geoff Bonnin (NWS, Office of Hydrology) talked about the 'New Southwest Precipitation Frequency Atlas' and other TP40-like topics. The SW atlas will use data through 2001 and will be subject to an external review. Other areas including Hawaii, Puerto Rico, and Ohio River Basin are being worked on. Plans exist to update the entire US with a 3-year period using a consistent technical approach and the latest data as recommended by the Advisory Technical Committee. Geoff pointed out that things are different with new management from Jack Kelly down to his position at the Hydro Data Systems Branch at the NWS Office of Hydrology. The Technical Review Panel includes Jim Angel (SC-IL) and Art DeGaetano (dir, NERCC). Data collection and quality control is contracted out to RCCs. He notes that QC techniques for frequency analysis are unique. The frequency analyses use regional L-moment analysis. The review of techniques will be done by external experts (\* including Efi Foufala at SAFHL). Currently spatial interpolation is done by starting with a hand analysis of the base map (2yr, 24 hr) which allow the use of meteorological expertise. That product is subsequently digitized. The plan is to use PRISM-like technology which will increase productivity, use repeatable technology, and will still use human expertise. Most of the specific area work is to be done by 02 with the national results by 05. Work is being done on a graphical user interface for web access. Using a geographical interface, a user pick a site and will get a precipitation frequency-duration curve graphs for periods of 5 minutes to 60 days and return periods up to 1000 years. The L-moment techniques actually choose the appropriate distribution of 6 or so. Pearson III is not as much judged to be the best anymore. When dams were being built in the 1940s, a need developed for frequency information which could guide dam design. Now funds for analysis must come from new and various partners.

Amos Winter (SC-Puerto Rico) talked about 'Interactive Climate Data Display'. See [atmos.uprm.edu](http://atmos.uprm.edu) for the web site of the 'Caribbean Atmospheric Research Center'. Some features that were highlighted included multi-station retrievals of data down to (\*) 10 minute resolution and (\*) on-line graphing using Java.

An optional UCAN demonstration Workshop commenced shortly after the regular close of the day's sessions (not nearly enough time for supper). A plug was made for BugZilla, a semi-automated bug reporting and tracking system. Technical descriptions of some variables that define data, products, stations, and etc. were offered as a prelude to a more specific programming example. The system uses 'client-side access' via CORBA (Common Object Request Broker Architecture) which is available in the public domain. A host client language that supports the use of CORBA is required. Examples include Omniware, IDL, or PYTHON. The CLIMOD retrieval interface offered by the NERCC (which runs on a machine with twin 350 Mhz processors with 256 Mb memory) uses routines written in PYTHON. A few 'applications' written in PYTHON were 'stepped thru' to demonstrate various function calls using the CORBA interface to accomplish tasks such as 'finding' a provider, establishing a time series for a specific station, and doing statistics on the time series.

Dave Theophilis (NWS-Omaha) talked about 'A Change in Forecasts of the NWS'. He talked about the Integrated Forecast Preparation System (IFPS) and the National Digitized Forecast Database. The forecast process would consist of examining guidance, editing guidance digitally, and automatically producing a product ('push a button'). The basis for the guidance products is a gridded database. The products would include text (zone forecasts), tables, and graphics. They are part of a National Digital Forecast Database Prototype Area (other prototype areas are in the far west, CA-OR, and in the southern Appalachians).

Stewart Foster (SC-KY, Climate Center, Geographic Systems) talked about 'geoprofiles' or spatial metadata for weather stations. He talked about geographically based influences such as topography including relief, roughness, slope, and aspect; natural features including soil, vegetation, etc.; and urbanization. He pointed out that data contains temporal effects such as seasonality, trend, and cycle but also includes spatial effects that are global, regional, and local as well as noise. Visual elements of sites were included to depict regional/local aspects of sites such as topography and digital ortho photos to help identify stations of similar/different settings. He showed examples of 'relative elevation (departure from site)'.

Roy Jenne (NCAR) talked about NCAR re-analysis and made many other database notes. He supplied a COOP station density study handout that showed a need for many new stations. He talked about the needs for observing long-term climate change: changes should be made to the observing system gradually and a low cost per station will ensure maintainability. He talked of the need to maintain the COOP network. He pointed out that while data will be gathered faster, automation is costly and with higher costs there is a tendency to lose stations. As for NCAR (NCEP-NCAR), he described the reanalysis of a global data set on an every 6 hours basis. Better methods are employed than originally used. More data is available but some early data is lost so hand analyses from that time may still be better. In order to answer 'how good are the new analyses?' forecasts must be done and the scores checked. He also indicated that that a world history for 54 years of rawinsonde, etc. exists. The NCAR/NCEP covers pressure at 17 levels, 'flux fields' (surface temperature, etc.), and etc. which together amount to a few Gb of data per year.

\* Pibals?

Sethu Raman (SC-NC) talked about North Carolina State Climatology operation. He indicated that they take on many state committee roles. Much undergraduate and graduate research on NC climate is taking place. The Office is developing an enhanced climate database which includes their own ECONet (automated stations) and other networked such as AgNet, ASOS, and AWOS. They are enhancing CPC outlooks for North Carolina use. Other Extension work is being done.

Adnan Akyuz (SC-MO) talked about 'Microclimate Characteristics of the Habitat for Endangered Missouri Plants (*Zigadenns elegans* – Death Camus)'. The study plant exists as a 'relict' in islands of unique habitat. While typically found in alpine/wetland habitats, it has disjunct populations in southern Missouri in north-facing dolomite cliffs. Those microclimates are being studied because not much has been done. Adnan and associates had to learn to rappel in order to get down the cliffs to download data from dataloggers that collected temperature, humidity, and light intensity. They prepared and deployed the 'Hobo' units in spring at 6 monitoring points on each bluff to monitor central as well as peripheral locations. Year-round deployments are planned.

Greg Shuler (Dynamic Predictables) talked about multi-year climate predictions based on global measurements. He indicated a 'la nina' type of state for the next 3 years or so.

Bill Mork (SC-CA) talked about some temperature trends in California. Stations with urban heat pollution are showing dramatic increases whereas at some rural stations the recent warmer years were less extreme than some 1930s values. The East Park Reservoir was shown as a station with few human influences. He also indicated that maritime stations reflect sea surface temperature warming.

Maury Roos (California Department of Water Resources) talked about the 'Possible Impacts of Climate Change on California Water Resources'. Warming will raise the elevation of snow pack; 3 degrees translates to 1500 feet. On average, such a rise could represent a reduction of approximately 50% in the snow covered areas on April 1 which would further lead to a 40% reduction in the April-July runoff. An ancillary effect could be the effect on stream temperatures; reservoirs supply cold water such as is suitable for salmon. Areas around Sacramento are below sea level and are protected by levees. Sea level rises threaten those lands. The sea level rise of recent years could become more threatening. Salinity intrusions could become more threatening. He also noted that the frequency of extreme short period flows seems to be increasing.

Mike Palecki (regional climatologist, MWRCC) talked about 2001 flooding in the midwest. Other recent major floods, e.g. 1993, 1997, were much more expensive; why? Answer: preparation. He described the very heavy snows of last season that built up maximum snow depths exceeding 30 inches along a rough axis from eastern South Dakota to northern Wisconsin and northeast Minnesota. He also depicted very heavy March 1 – April 30 precipitation over much of the same heavy snow areas (3 to 6 inches above normal). He pointed out that the snowpack, maintained late into the season, was accompanied by

persistent high precipitation. He showed that the 2001 flows were comparable in many places (but not higher) than flows in 1993 and 1965.

George Taylor (SC-OR) commended Jim Angel (Pres.-IL) for making a lot of trips this year to enhance the AASC.

Jim Angel gave last details about lunch discussions and an afternoon RCC meeting. He mentioned that Jim O'Brien (SC-FL) had volunteered to be the AASC 'parliamentarian'.

The meeting was adjourned.

#### MWRCC issues:

- \* MSP area dot shown on map of 1<sup>st</sup> 25 CRN stations – Steve Hilberg of MCC will call.
- \* Fort selection is being done at MWRCC.
- \* Steve talked about climate data modernization, pre-1948 hourly data sets, the QC of pre-1948 daily COOP data is being done by Ken Kunkel.
- \* For the midwest RCC, upper-air soundings archive for 46-97 is now online with a graphics interface.

#### Contact/notify others, other action required:

- \* Kathy: circulars online via WSSRD.
- \* NWS local offices decide which COOP stations appear in CD (e.g. 'blank' snow sites)
- \* Send message about 'all zeros except missing on non-zero precipitation days' being code for snowfall for forms on which snowfall column is entirely blank.

#### MNSCO development leads:

- \* on-line data entry: 'ROSA' (not called that) has no DB access for the user – messages (SHEF?) only
- \* Pasteris: An article in JAM Aug 2000 describes a serially complete data set that includes deaccumulated precipitation.
- \* Steve del Greco (NCDC) uses SURFER to get Laplacian field to detect 5 degree variations.
- \* Amos Winter uses/displays data down to 10 minute resolution.
- \* Amos does on-line graphing using Java.

#### Other:

- \* WSSRD online.

#### DONE:

- \* email MapServ info to RCC/UCAN folks, and Steve del Greco at NCDC.
- \* Get MN meeting info to Dwight.
- \* Send a 'work plan' to Steve Hilberg and he will get an MCC 'letter –of-approval' out right away.

## State Climatology Office – Minnesota, FY 2001-2002

Jim Zandlo, State Climatologist

Greg Spoden, Assistant State Climatologist

Pete Boulay, Operations Climatologist

### PROJECTS

- Design and implement multi-parameter web-based input capability for NWS COOP data (SODdbf).
- Install DNR/UM MapServer for NT and test use for Climatology web application 'MN location selector'.
- Implement a ROSA (real-time data from NWS data services) ingestor.
- Write web-based retrieval applications for monthly map browsing and a HIDDEN (high density precipitation) county-month daily 'dump' (w/utm coordinates).
- Deploy new Web server. Implement latest security measures and install SCO web-based applications. Reconfigure old Web server to continue automated data acquisition only.
- Re-work interactive data retrieval applications to improve user friendliness.
- Confer with MNDOT re: retrieval, archival, and dissemination of RWIS (Road Weather Information System) data.
- Obtain or create 1971-2000 normals data set. Create variety of products and Web-based retrieval methods.
- Establish an hourly database operationally including a data ingest and maintenance application. Ingest TD-3280, METAR since mid-1990s, and Fire Weather Observations into HOURdbf format. Write application for web-based retrievals.
- Develop web-based insect degree day extrapolation routine.
- Develop a section on our web site devoted to legal and insurance resources ('how to...').

### ONGOING tasks

- Provide short-response-time customer service to phone, e-mail, mail, and walk-in requests for data
- Present relevant seasonal climatic features at Spring Flooding Coordination Meeting of the River Forecast Center and Corps of Engineers.
- Produce weekly climate products such as rainfall and snowdepth maps.
- Produce seasonal and special condition assessments (ice-out projections, flash flood analyses, drought summaries, etc.) as appropriate.
- Make standard climate products available via INTERNET.
- Enhance climatology 'Web page' based product delivery in conjunction with DNR INTERNET committee recommendations.