

Drought Monitor Forum Summary Paper Including Recommended Actions

1st Annual Drought Monitor Forum held in Lincoln, NE November 16th and 17th, 2000

The first annual Drought Monitor Forum meeting was a great success and attendance both days showed that this product has generated a lot of interest across the nation. Well over 50 people from all over the country attended on day one. A summary of the discussions held and recommendations made are detailed below.

In addition to this meeting, Warren Lee (USDA Drought Coordinator) met with many of the participants, including the Directors of the regional climate centers (RCC's), to discuss modernization, expansion, maintenance and coordination of climate observation networks.

DAY 1

Most of the first day was spent listening to a group of invited speakers who came from diverse backgrounds. We were able to hear the perspectives from users of the product. They conveyed to the group what they perceived to be the strengths and weaknesses of the Drought Monitor (DM). We have compiled, consolidated, generalized, and summarized the main themes from these speakers below:

- 1) Perhaps the most recurrent theme that came across loud and clear from the speakers on day one was the need for two separate maps and a composite map in order to help integrate and depict agricultural vs. hydrological drought. The thinking is that the two individual maps for short- and long-term drought would help make reading the composite map easier. This should help clarify the meaning of the A, W and F impact indicators.
- 2) It was stated many times that there is a strong need for comprehensive, reliable data in near real-time in order to make any monitoring product better, while also meeting the needs of the various users out there. Good data means good products. We should support any efforts in order to improve these networks and ultimately the responsiveness of the Drought Monitor.
- 3) Another repeated theme was to NOT ignore or lose the flavor that impacts (due to drought) play within the product.....drought is too complex to be captured by objective indicators alone. Many stated that there was a simple beauty in the uniqueness the DM portrays with an emphasis on impacts (which incorporates local input). Can we develop and/or include more impact indicators?
- 4) Suggestion for weekly press releases/conferences about the Drought Monitor (one voice).
- 5) Could the Drought Monitor (or its methodology) be used as one of the tools in determining CRP (Conservation Reserve Program) acreage release by USDA/FSA?

- 6) The Drought Monitor has caught the attention of many Governors, congressional delegations and state drought task forces across the United States.
- 7) Don't underestimate usage by the media, producers and commodity people. The internet medium has brought the Drought Monitor into many places never before possible in a timely fashion. We also need to be aware of unintended consequences or misuse of the product by those who aren't really versed on the intent or makeup of the product.
- 8) Many offered congratulations in regards to the cooperative effort between two government agencies and a university. The consensus approach has been a great success!
- 9) Perhaps temperature departures need to be considered in the product.
- 10) Incorporate one SPI computation methodology and get it down to a weekly or daily temporal scale. This needs to be a priority and some resources need to be provided in order for it to happen. Given the SPI's flexibility, this would then be a great addition into the current and/or proposed objective blend products.
- 11) Need for more observed soil moisture sites/networks along with coordination between them. Also along the lines of soils, we need to better implement some of the existing digital soil layers of NRCS into existing models/products/assessments if at all possible.
- 12) Never refer to, or say "drought" without modifiers in front of it! We still need to be careful as to what modifiers are used, however. Our terminology must be clear.
- 13) Continue to educate and push this product in front of the media, producers, politicians, public, etc. NWS people at the meeting said this product has a) relieved them of an onslaught of media calls, and 2) gives them a simple graphic they can refer to which makes communication with users easier. This product may be a start to having a lot of people on the same page and speaking in one voice, so to speak.
- 14) Provide better access to end users so that they can provide feedback on the product. The NDMC will work on developing a web based form for this process in the future.
- 15) Some user's wished to see more in-depth forecast info brought to the DM. Others wanted it kept as far away as possible so as to not confuse the public on drought assessment vs. forecast (NOAA/CPCs' Seasonal Drought Outlook) issue.
- 16) Could we give a % chance that the drought will prolong itself during the growing season and could one include the amount of moisture needed in affected areas to reverse the drought? These could actually be considerations for incorporation into the Seasonal Drought Outlook product and not the Drought Monitor.

- 17) One natural indicator that has seemed to fall through the cracks is range/pasture conditions. Is there a way to better incorporate this into the DM. This is important for grazing and feeding operations in regards to livestock issues.
- 18) Be aware of how one can be in drought and wetness at the same time on different scales

DAY TWO

All of the authors and around 15 other participants remained to discuss the previous days comments, look at addressing a “laundry list” of Drought Monitor issues and look at recommending future actions/directions for the product.

The West:

- In regards to addressing drought in the West: There may never be a catch-all accurate way to objectively assess drought in the West. Perhaps there should be a separate (more detailed) effort to depict drought in the West parallel to the DM. In fact, original ideas called for the idea of having the six regional climate centers involved in developing regional drought products of a similar nature that were tailored to their region. They would compliment the simplistic, broad-brushed approach to the nation that the current product reflects. One could click on the Drought Monitor and be taken to the regional analysis and then the state analysis from there in a nested fashion. Of course, much more in the way of resources would need to be committed and/or allocated to get such an effort off the ground and coordinated with the DM.
- Phil Pasteris with NRCS’s Climate and Water Center, updated the group (on Day 1 actually) on efforts in regards to the Unified Climate Access Network (UCAN), SNOTEL (NRCS’s snow telemetry high-elevation automated network) and the development of a *western regional* Surface Water Supply Index (SWSI) that would take into account snow pack, reservoir storage, and observed or forecasted streamflow. All of these will play a role in how the Drought Monitor will evolve and will help to give the product a better foot to stand on in the West where other indices are virtually rendered useless.
- Kelly Redmond of the Western Regional Climate Center also shared his western regional perspective with the group. Drought is a phenomenon defined by its impacts therefor, it is subjective by nature. There have been many attempts before to consolidate (blend) indicators but they are limited temporally and spatially. In the West, one may still need to use each individual product as one of many tools.
- The West needs much more regional detail in climate monitoring. There is a greater need for station data as opposed to gridded data. The data need to be sensitive spatially to elevation. NEXRAD isn’t very useful in the West, for the most part.

- Maybe we should look at getting off of climate division boundaries and look at ecological or hydrological units.
- Need faster access to daily data from long-term reliable sites. Co-Op along with the other automated networks (SNOTEL, RAWS, others) in the higher elevations are essential.

General Discussion Topics:

- Doug Le Comte reported that the Vegetation and Temperature Condition Index (VT) has been aggregated into a climate division layer by Felix Kogan at NESDIS. This will allow for better interpretation and implementation into the DM. Others felt like it may be a little premature to include this product into any of the Objective Blend products. There is much we don't understand yet (seasonal transitions, early or late planting relative to a short time series, over wetness causing stress, etc.) on how the tool reacts to certain situations, and thus, subjective interpretation must accompany this particular product. It has been and will continue to be a very useful tool in complimenting the other tools we use in making the map each week.
- A lot of discussion was held in regards to how the CPC soil model may or may not be improved. Is there a way to incorporate a better (drought sensitive) soil component into the model which would allow for regional variations depending on water holding capacity or other factors? Doug Le Comte and Rich Tinker agreed to take these questions back to the makers of the CPC soil model.
- NCDC will come aboard as contributing authors sometime in the Spring of 2001. Richard Heim and at least one other person will be brought up to speed on the details and methodologies in the making of the DM during the upcoming months.
- Will work to readily incorporate the changes to 7-day streamflow averages once USGS gets that system up and running later this year or the first of next year.
- Need to get the Bureau of Reclamation and Corp of Engineers more involved in the DM effort.
- The DM could benefit from better uniformity of state NASS reports

Short-term vs. Long-term Blends:

Much discussion was given to the subject of creating two new separate objective blend products to address short-term and long-term drought. The Drought Monitor as it is now would continue to be the focal point. The methodology of this product will virtually remain the same.

The intention of the two additional blend maps is to better objectively show which areas are suffering from short- or long-term dryness/drought. When one comes to the Drought Monitor map they would be provided with links (or postage stamp maps) to the two different blend maps. It is hoped that these

maps will help to clarify the A, W and F impact indicators shown on the composite map.

There are some concerns and issues to hammer out in regards to what parameters would go into the making of these two blend maps. It was agreed upon that we would proceed as soon as possible (with CPC shouldering much of this responsibility) in a testing mode to see how they do compared to the current blend map which is made up of the PDI, 30-day precipitation % of normal, and the CPC soil moisture model.

Some of the concerns we will look to address include:

- are these parameters not as independent as we (ex. are all using a bucket approach to soil moisture?) think they are leading to a predictable final outcome?
- are the inputs truly independent of one another or do they tend to cancel one another out leaving an answer found somewhere in the middle by default? In this apples vs. oranges example, the short-term 30-day % norm ppt and the long-term PDSI would in effect “cancel” each other out leaving the soil moisture as the driving force in the current blend. Is the soil moisture model truly reflective as a long- or short-term indicator or both?
- the VT index is probably not well suited to being put into a blend map due to interpretation requirements but it can serve as a very valuable stand-alone tool;
- should the long-term blend only be run every month or on a bi-weekly basis?
- make getting the SPI down to a weekly or daily calculation a top priority so that we can incorporate it as both a stand-alone tool and as part of the blends given its temporal flexibility. The SPI is now calculated generally on a monthly basis by climate division. We also need to just use the computation methodology recommended by Ned Guttman at NCDC after his research determining the best data transformation fit;
- somehow introduce a temperature threshold trigger to help capture “flash” droughts like what we saw in the Southern Plains this summer where high temps and winds led to a very rapid deterioration of moisture and crop conditions;
- try to incorporate range/pasture conditions into the mix as it is a very good “natural” indicator of drought.

In short, here is what we agreed to do with the two new experimental blends:

Short-term Objective Blend Input Parameters:

- Crop Moisture Index (use only seasonally from June-August each year)
- 30-day precipitation % of normal
- CPC Soil Moisture Model
- Avg. 10 degree Celsius temperature threshold for PET purposes
- 2-month SPI (when we are down to weekly calculations) CPC looking into 1/4x1/4 degree grid calculations in the interim

Others mentioned or discussed:

VT, KBDI, Range/Pasture Conditions from NASS, Observed Top Soil Moisture (if down to county level or climate divisions rather than at state levels), observed soil moisture readings

Long-term Objective Blend Input Parameters: (to be computed bi-weekly or monthly)

- PHDI (Palmer Hydrological Drought Index)
- 180-day precipitation % of normal
- CPC Soil Moisture Model
- Avg. 10 degree Celsius temperature threshold for snow cover purposes
- 12 and 24-month SPI (when we are down to weekly calculations)CPC looking into 1/4x1/4 degree grid calculations in the interim

Others discussed or mentioned:

SNOTEL snowpack water equivalent % of average, wells or groundwater levels, western regional SWSI values

Recommendations:

- 1) Go to a total of three products while still maintaining the one Drought Monitor map (keeping consistency). This would consist of 2 objective blend products and the Drought Monitor map. The automated short- and long-term objective blend products would serve as two additional tools used in developing the composite map (which is how the current Drought Monitor looks now). We would provide links to these products through the Drought Monitor home page. The frequency of the short-term product would remain weekly but the long-term product wouldn't need to be and could end up being produced on a bi-weekly or monthly basis. These blends will be calculated on an experimental basis so that we can evaluate/modify the products. This new methodology will run parallel to the current process and will not change the existing methodology. The word drought will not be used in the titles of these two products....perhaps just short-term dryness objective or just short-term dryness will be used instead.
- 2) This group is a strong supporter of any initiative that would bring together good data in a more timely fashion in order to better serve our wide variety of users. Real-time data is not yet efficient enough to provide for the resolution and accuracy needed. This product depends heavily on the support, maintenance, modernization, and expansion of critical networks such as NOAA's Cooperative Observer network, along with various automated networks like SNOTEL, RAWS and the various state and regional climate center-run mesonets. Continued and increased support and coordination of these networks is most important to the long-term health of any climate related monitoring activities in the United States including the Drought Monitor.
- 3) Pending approval by all parties, the term "first-stage" drought will become "moderate" or "incipient". **NOTE:** This has since been modified to read "moderate drought".
- 4) The first draft of the summary text will be due out by Tuesday for review.

- 5) Map will be assumed final at 8:00 am eastern time. If the author is intending on making late changes on Thursday mornings, they will email or call the NDMC by 8 am eastern. Otherwise, the map will be posted or will have to wait until 3:30 pm that afternoon.
- 6) On weeks with Thursday holidays, the Drought Monitor will be posted by 8:30 am eastern on Wednesdays.
- 7) The authors name will be included as an e-mail link to the author group beneath that week's summary text so that people can talk to the person who made the map.
- 8) The weekly map will not be made clickable unless the masses speak out against this.
- 9) "Outlook" header at the bottom of the summary text will be changed to "Prognosis" or some other term so as to avoid confusion with the Seasonal Drought Outlook product produced by NOAA/CPC. **NOTE:** Since then, the authors and cooperating groups have agreed to use the wording "Looking Ahead" instead of "Outlook".
- 10) Ultimate goal is to get the system to the point where one would have the national Drought Monitor map in its current form and then they could click to go down to more regional-scaled drought maps and finally down to state-level detailed maps. This cooperative effort would be coordinated between the current Drought Monitor partners as well as the Regional Climate Centers and the State Climate Offices.