

MINUTES - NORTH DAKOTA ATMOSPHERIC RESOURCE BOARD

NOVEMBER 2, 2011

Chairman Henry Bodmer called the meeting of the North Dakota Atmospheric Resource Board to order at 1:32 p.m., November 2, 2011 in the Lower Level Conference Room, State Office Building, Bismarck, ND.

ROLL CALL

Roll call was taken. Members present were Henry Bodmer, David Hagert, Monte Hininger, John Bollingberg, Tom Tupa, and Michelle Klose for Todd Sando.

Others present were Darin Langerud, Director; Mark Schneider, Chief Meteorologist; Kelli Schroeder, Business Manager; Dan Brothers, Meteorologist; Hans Ahlness, Weather Modification, Inc. (WMI); Dr. David Delene, University of North Dakota and via tele-conference for a portion of the meeting, Dr. Paul Kucera, National Center for Atmospheric Research.

MINUTES

IT WAS MOVED BY MR. BOLLINGBERG, SECONDED BY MR. TUPA, AND CARRIED ON A VOICE VOTE TO APPROVE THE MINUTES OF THE APRIL 6, 2011 MEETING AS DISTRIBUTED.

FINANCIAL UPDATES

2011-13 Budget and Financial Status Report

Ms. Schroeder reviewed the 2011-13 budget as approved by the Legislature. The financial status report for the period ending September 30, 2011 was also reviewed. The report is based on the current biennium which began July 1, 2011 and ends June 30, 2013. Additionally, costs specific to the NDCMP will be reviewed with agenda item 4.2. There were no further questions.

2011 NORTH DAKOTA CLOUD MODIFICATION PROJECT (NDCMP)

Project Overview

Mr. Langerud provided the board with an overview of the NDCMP project for 2011. Historic flooding and generally wet conditions contributed to the decision to suspend all activities in District II until July 6th, after the crest of the Souris River. Mountrail County Weather Modification Authority wanted to begin hail suppression seeding in late June. However, Mr. Langerud didn't feel that was prudent given the flooding situation in neighboring Ward County. Rain enhancement suspension continued through the entire project except for a short period of time in McKenzie, Bowman and Slope Counties.

District I elected to extend the project through September 8th. However, there were no seeding missions conducted in the extension period.

Mr. Langerud explained the decision-making process behind suspension of activities. Each county involved in the program has a locally appointed 5-member board, called the weather modification authority, which is appointed by the county commission. There is also a local district operations advisory committee, including one member from the county weather modification authority and one county commissioner. Both groups were polled before the beginning of the program, having been given Mr. Langerud's recommendation for full suspension. Everyone agreed with the decision. We revisited the decision periodically throughout the upcoming weeks. Local input was provided before any of the suspensions were lifted.

Suspension of rain enhancement activities is a fairly routine procedure. Typically it occurs in the spring if it is too wet for planting or once harvest has begun in August. Having a complete suspension of activities is very rare. The last time this occurred may have been in 1982 or 1983, however that suspension did not last 5 weeks. Short-term suspensions also occur throughout each project when flash-flood warnings are issued and also when tornadoes are present, as dictated by our safeguards criteria.

Cost Summary

Ms. Schroeder reviewed the cost report for the 2011 NDCMP. District II was \$91,340 under budget, primarily due to very limited flight hours. The majority of the chemical cost overages this year related to the acetone bid. This year a barrel of acetone cost \$410 plus shipping, as compared to \$339 plus shipping last year.

Mr. Langerud noted that county funds are considered special funds, which can be carried over from one biennium to the next. Any unexpended special fund dollars will remain in the program for future years.

Ms. Schroeder also reviewed the costs for housing. In order to have housing available for most of the Stanley crew next year, we have had to obtain an apartment with a year lease from Lutheran Social Services.

Mr. Langerud noted that Lutheran Social Services is not allowing subleasing at this time. We were hoping to work out an arrangement with the school district for the nine months we are not in Stanley. However, the school district was not in need of a place at this time. If that changes, we will discuss subleasing with Lutheran Social Services again.

New battery backup systems were purchased for both radars for \$1,088 each, which caused us to be over-budget in the radar maintenance and parts category. Previous battery backups were failing to hold over radar operations until the generators kicked in during power outages.

Expenditures for intern co-pilots are entirely state-funded through a separate general fund appropriation. Interns were paid \$10 per hour. We were instructed to put in a 100% general fund budget request. Therefore, we cut operating funds and moved them into salaries and wages for the interns in order to increase pay from \$9 to \$10 per hour. We

also plan to increase intern wages to \$10.50 per hour for 2012 and \$11 per hour for 2013.

Mr. Langerud has been advising counties that their budget requests for NDCMP 2012 should not need to increase more than 3-4%. While we will be able to apply some of the carryover funds to the cost for 2012, we will probably be requesting counties increase funding by 3-4% due to ever-increasing costs. Budgeted flight hours have been reduced each of the last two years, as we have been using fewer hours in the last 10 years. This is due to: learning to use the aircraft resources better; weather not being generally as severe; and wetter climate causing more rain enhancement suspensions.

Seeding agent usage / inventory

Mr. Schneider reviewed the ending chemical inventory for the 2011 NDCMP. Ending chemical balances were almost identical to the 2010 season due to the limited hours flown this year. We purchased 150 units of silver iodide and sodium perchlorate and 215 units of ammonium iodide this past spring. We used 154 units of silver iodide.

Ammonium iodide inventory is low compared to silver iodide and sodium perchlorate. It has a significantly shorter shelf life than the other two, so keeping excess is not cost-effective.

Mr. Schneider noted that chemical used per flight hour this year was similar to 2010. 1,504 pounds of dry ice was used at a rate of 31 pounds per flight hour, similar to 2010 as well.

We have 4,153 units of 20g ejectable ICE flares in inventory. This is enough for 2 full seasons. There are enough burn-in-place (BIP) flares for 1-½ seasons or 1,225 units. An extra 500 BIP flares were purchased at the end of June.

This spring, the lowest silver iodide bid was 65% higher per bottle when compared to 2010. The cost of silver was around \$48 per ounce, which was a factor in the increased bidding price. Now silver is at about \$34-35 per ounce. We expect to purchase a small amount of silver iodide next spring.

Generator performance

Mr. Schneider reviewed generator performance. In 2011, there was 4.3% failure. The 5-year average failure rate is 3.5%. The increase this year is likely due to the low number of hours flown.

Intern Programs

Ms. Schroeder reviewed the intern program. There were 9 intern co-pilots and 3 intern meteorologists. We have trained a total of 318 pilots and 38 meteorologists.

Due to the small number of applicants for the intern pilot program, Mr. Langerud and Ms. Schroeder attended the Student Aviation Management Association (SAMA) Career Fair at the University of North Dakota (UND) in order to generate more interest in the program. Mr. Ahlness feels that flight instruction opportunities are a larger draw due to

the need to have more flight time to work for the airlines. They won't get near the number of hours on this project as they potentially could by doing instruction.

We have a Memorandum of Understanding with UND to strictly work with them for this pilot internship program. UND is the only school that has a weather modification curriculum, which is a requirement of the internship.

Intern pilots generally make about \$4,000 for the 2-½ months they work on the project. Intern meteorologists will make between \$5,000-6,000 because they work more overtime and generally stay on project longer. Flight time at UND generally costs students \$250-300 per hour. For example, if you look at interns getting 75 hours of flight time during a summer on NDCMP, that is a huge benefit to the student. Aviation internships are usually unpaid.

Some things that may be factoring into the low interest include: hesitancy to take a summer job in rural western North Dakota (most have never been there before and only lived in metro areas); and twin-engine flight time is not as valuable as it used to be (total flight hours are more important to airlines). Mr. Langerud feels the most important thing we can do is to increase the visibility of this internship on campus, as we started last year.

Supervising pilots-in-command or meteorologists evaluate intern performance, but we also have the interns evaluate the program. The student recommendations were reviewed. One suggestion was to pay a salary rather than hourly wage. We could pay the interns on a salary basis. They are non-exempt according to Fair Labor Standards Act, so we would still have to pay overtime pay for any hours over 40 in a week. Mr. Langerud noted regardless of how we pay the interns; we are still limited to our appropriation given by the Legislature.

Mr. Langerud mentioned that UND is considering combining the two weather modification courses into one class. This would cost the students less. Currently, the introductory class can be used towards a pilot's meteorology minor but the advanced class cannot and is used only for extra credit if not selected for the internship. If combined and the MOU adjusted accordingly, we're hoping we could have a larger pool of applicants from the one class. However, UND would have to make that decision.

Mr. Bodmer suggested WMI hire two pilots per aircraft when the next contract is negotiated, instead of ARB hiring intern co-pilots.

Mr. Bodmer asked if there was consensus that we should: increase visibility of the internship at UND, pay higher wages, and look at a salary pay schedule. Mr. Hininger thinks we should leave that to Darin's discretion. There was no further discussion on the topic.

Aircraft Operations

Mr. Langerud summarized flight log data. He also reviewed the contract clause, which requires aircraft to be operational. There were three incidents this year where aircraft were unable to launch due to various reasons. Those were reviewed with surrounding

circumstances and Mr. Langerud recommended one penalty be applied to the final contract payment.

IT WAS MOVED BY MR. HAGERT, SECONDED BY MR. HININGER, AND CARRIED ON A VOICE VOTE TO APPROVE THE DIRECTOR'S RECOMMENDATION TO APPLY A ONE-DAY PENALTY (\$1,014) TO THE FINAL CONTRACT PAYMENT.

Contractor's Final Report

Mr. Ahlness reviewed the contractor's Final Operations Report and his thoughts on housing for the 2012 project.

IT WAS MOVED BY MR. TUPA, SECONDED BY MR. HAGERT, AND CARRIED ON A VOICE VOTE TO ACCEPT THE FINAL OPERATIONS REPORT AND AUTHORIZE THE FINAL CONTRACT PAYMENT TO WEATHER MODIFICATION, INC.

The Board took a short break while the audio and video equipment was setup for the next two presentations.

ARB RESEARCH & EVALUATION PROGRAM

Polarimetric Cloud Analysis and Seeding Test 3 (POLCAST3)

Mr. Langerud introduced Dr. Paul Kucera with the National Center for Atmospheric Research and Dr. David Delene with the University of North Dakota.

NorthPol radar analysis update

Dr. Kucera reviewed the POLCAST goals, operational overview of experiments in 2008 and 2010 and radar analysis. Data is showing the hygroscopic seeding having some effect on precipitation initiation, which is encouraging. More cases are necessary to show statistical significance.

Cloud microphysical data analysis

Dr. Delene reviewed the airborne data measurement from the POLCAST experiments and weather forecasting model used in the project. He also reviewed instrumentation used, performance checks, and cloud condensation nuclei (CCN) comparisons.

ISSUES FOR NDCMP 2012

Availability of housing

Mr. Schneider reviewed housing issues expected for 2012, especially in Minot and Watford City. We are expecting that Power Fuels in Watford City will help us out again, unless they don't have enough room for their own employees. There is a new housing coordinator, but she indicated that since Power Fuels has helped us in the past, the precedent has been set and will likely continue as needed.

We are also hoping to rent from the same people as last year in Williston. Mr. Schneider spoke with the owner and they thought they would rent to us unless they filled the

basement apartment by summer. It is likely that this will work out, as they don't want to rent their basement apartment out year-round.

In Stanley, we tried to obtain a three-bedroom apartment from Lutheran Social Services to accommodate all five staff members. However, they would only allow us a two-bedroom apartment with a maximum of four residents. We will still need to find housing for the WMI pilot.

Mr. Langerud mentioned that we are also considering providing a housing allowance due to the outrageous rental costs in the oil field.

Development of PARS replacement system

Mr. Langerud briefed the board on our current record keeping system for the NDCMP, called PARS (Palm Aircraft Recordkeeping System). It was developed in-house using a PDA (Personal Digital Assistant) and GPS (Global Positioning System) six years ago and have been using it since. The hardware is getting more difficult to find as smart phones have replaced PDAs. Additionally, the software is also out-of-date.

We are working on replacing the system and rewriting it to improve functionality and take advantage of newer technologies. Paul Moen, State Water Commission IT employee, is working on the new application.

We considered the iPhone, however the Federal Communications Commission precludes cellular communications on an aircraft. You cannot turn off cellular service on the iPhone without turning off GPS, which is necessary for flight tracking.

The other possibility is an iPad, which has larger screen real estate. If you get an iPad with cellular capabilities, you can buy cellular service on a monthly basis. You can turn the cellular service off while in the aircraft while keeping the GPS running. We are collaborating with WMI on this and hoping to at least have a test version ready for next summer.

District 2 radio communications enhancement

Mr. Langerud briefed the board on issues we have with radio communications between the radar in Stanley and base-seeding aircraft in southern McKenzie County when they are flying low enough to lose line-of-sight contact.

We are considering setting up a repeater or telephone patch system that would allow the aircraft to call into a repeater system. This type of system would call the Stanley radar via telephone, allowing the aircraft and radar to exchange information and logistics. We are also collaborating with WMI on this.

Mr. Ahlness indicated that WMI has an aircraft setup to test this and expect to be testing on this as early as next week.

Update on Powder River Training Complex Military Operations Area expansion

Mr. Langerud updated the Board on the status of the proposed Air Force expansion of the Powder River Military Operations Area, which would affect District I flight and radar

operations. We expect a Record of Decision on this in the spring of 2012. The Air Force has to get approval from the Federal Aviation Administration for this flight space as well.

RADAR OPERATIONS

HVPS/Modulator modification status

Mr. Langerud updated the Board on the issues we've been having with the radar upgrades. We've been unable to operate the radars at 100% power due to issues with a mismatch of one component of our radars and the upgrades. One of Vaisala's technicians came out in September to do testing. We agree that the issue resides with the one component that they upgraded. Vaisala is discussing this with their vendor that made the equipment on how a modification can be implemented that would alleviate the situation.

Year-round Bowman radar operations

Mr. Langerud mentioned that we've been operating the Bowman radar year-round since January 1, 2011 in addition to the NDCMP operational season through support from eight counties: six in southwest North Dakota, Fallon County in Montana, and Harding County in South Dakota. Emergency managers were the primary point of contact. Six of the eight have already committed funds to this operation for 2012; another believes the county will fund it. Stark County is the only one we haven't heard from as of yet.

There has been additional interest in this data from the National Weather Service (NWS) in Norman, Oklahoma. They do a lot of radar work on the research end that gets supplied to the operational forecasting offices. We are in discussion with them on their integration of our Bowman radar data and possibly Stanley in summer months to help improve radar precipitation estimation in the numerical models they use. The Bowman radar resides in a NWS coverage gap, which is why this generates more interest.

Williston NWS radar shutdown

Mr. Langerud recently learned that the NWS Williston radar is being shut down. This radar is similar to what we operate in Bowman and Stanley. When it is shut down, we may have the ability to acquire spare parts through federal surplus property for our systems.

North Dakota Climate Advisory Board

Mr. Langerud received a call from the Grand Forks NWS office recently regarding creating a group of in-state experts regarding North Dakota's changing climate. The group includes staff from the Bismarck NWS office, United States Geological Survey, International Water Institute, North Dakota State Climatologist, and our office. They have had one conference call, led by the Grand Forks NWS office and discussed other groups who may be interested. The United States Army Corp of Engineers and University of North Dakota were suggested.

The working charter of the group was established: consolidate known expertise in climate science to inform decision-makers with the intent to protect life and property. This will be achieved by providing the most likely scenarios to those responsible for

implementing and enacting protective measures. The focus is on the near-term climate out to about 10 years, with an emphasis on hydrologic and sociological responses.

2011 ARB COOPERATIVE OBSERVER NETWORK (ARBCON) REPORT

Status report

Mr. Brothers reported that 411 people signed up to report snow measurements, but not all reported. About 230 people reported snowfall amounts or snow-water equivalent amounts. For the year-round network, we had fewer than 700 people signed up and 650 actually reported data.

Growing season rainfall totals and grid maps

Mr. Brothers displayed precipitation maps for the winter and growing season months.

ELECTION OF OFFICERS

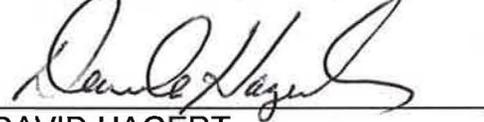
Mr. Langerud called for nominations for offices.

MR. BOLLINGBERG MOTIONED TO NOMINATE THE EXISTING SLATE OF OFFICERS. MR. TUPA SECONDED THE MOTION. MR. HAGERT, MR. HININGER, MR. BOLLINGBERG, MR. TUPA, AND MRS. KLOSE VOTED AYE. THERE WERE NO NAYES. MOTION CARRIED.

Being no further business the meeting adjourned at approximately 5:13 p.m.



HENRY BODMER
CHAIRMAN



DAVID HAGERT
SECRETARY-TREASURER

Transcribed by Kelli Schroeder

