

June 2014 TAC, June 26<sup>th</sup>, 2014

**Agenda Items: Decision Brief, Met Signal/Precip Non-Precip Algorithm**

Presenter: John Krause

**Post Briefing Questions and Comments:**

**Dr. Snow:** Removing erroneous signals looks like it may have decreased the sensitivity.

**Response from J. Krause:** If you flag the data as precip, then they are measured the same by the algorithm. They may just be a thresholding piece, or it just may be off

Dan Berkowitz: Retains the same hydro class.

**Dr. Snow:** We don't want it impacting the good signal.

**Response from J. Krause:** It may impact the good signal.

**R. Ice:** I noticed your using a notch around ???,

**Response from J. Krause:** ???

**Rich Ice:** It may have missed detection.

**Response from J. Krause:** It doesn't look that different from birds

Ice: Quantitative analysis could help.

**Response from J. Krause:** Take each bin and draw an outline with the mouse. The user has to be very specific. It is easier to use the kbox. How much trimming should be done? There will be a lot done by hand.

**R. Ice:** Will need to use quantitative analysis similar to how it is being done with they are using with cluttering.

**D. Smalley:** In winter you would hope that the operator has switched to winter setting on radar. Not sure that is the best. I would want to be very cautious

**Response from J. Krause:** Data does not start to show up until ?? miles from the radar.

**D. Smalley:** I'm worried about reduced confidence in the radar. Concerned with putting the requirement to change the 80/70 setting on the operator. Has impacts to the icing algorithm and doesn't want the tradeoff but sees the benefit to QPE.

**Response from J. Krause:** signal currently operating on is less than 10 dbz.

**D. Smalley:** We don't want to lose that data.

**J. Krause:** Data will be gained.

**D. Smalley:** Recommend that a separate KDP be used to keep it separate, so both views are available. Keep original data available for users who want to keep using.

**Response from J. Krause:** That would be a question for the ROC. We're merely working with the science.

**Dr. Snow:** Agree with J. Krause. It's a question for the ROC; our focus is on the science.

**M. Istok:** From a workload perspective I'm concerned if ops will know when to switch between the 80/70 threshold. Does it incorporate model data? If not, is that feasible.

**Response from J. Krause:** It could but it would make the algorithm more complicated.

**M. Istok:** It could be based on the temperature?

**Response from J. Krause:** It is possible to automate the flip, however it is not recommended. I would recommend that the Hotline be contacted to control the flip based on their recommendation.

**M. Istok:** The impact on the forecaster must be considered.

**Response from J. Krause:** If you are having a lot of trimming that you do not like, you can turn it off during winter.

**M. Istok:** My preference would be for it to be automated.

Ken: What will be the impact to other algorithms such as HCA?

**Response from J. Krause:** HCA does not use KDP very much. It should not impact it.

### **Agenda Item: Presentation: Advances in Spectrum Width Estimation**

Presenter: Dave Warde

#### **Post Briefing Questions and Comments:**

**R. Ice:** It used 20 dB SNR, have you evaluated at lower values?

**Response from D. Warde:** Yes, they [the proposed estimators] perform at the same [statistical] level as the legacy at low SNR. At high SNR levels, they perform at the same [statistical] level as the theoretical estimators.

**Greg M. -NCAR:** How were you doing a possible hybrid?

**Response from D. Warde:** The estimator that gives the best wide spectrum width performance is used first, when it provides meaningless values (typically set to 0 m/s), I switch to the next estimator that provides the best wide spectrum width performance. It is a simple approach. Performance with R0 in the numerator of the proposed estimators is better in variance than using R1 or R2 in the numerator of the estimators. You don't want to use the R1 or R2 estimates in the numerator at all. For example, the proposed R0/R2 estimator performs better than the standard R1/R2 estimator. Some work could be done to make it optimal.

**J. Evans:** This all hinges on assumption of the Gaussian spectrum.

**Response from D. Warde:** Correct. Another estimator, the classical spectrum width estimator, which is shown in the back-up slides, could be used. This estimator does not use the Gaussian assumption.

**J. Evans:** We need to keep it in mind.

**Response from D. Warde:** Agreed.

**J. Evans:** What is the application? What is the theory for using R0 over R2?

**Response from D. Warde:** There is a theory statisticians do recommend; currently we are using the Pearson method...

**J. Evans:** If you assume your model is a Gaussian, then when is it the right answer to use these ratios?

**Response from D. Warde:** Based on previous studies, this is the way to go.

**Greg M. -NCAR:** Two points: Give you two unknowns and two knowns, what is going to give you better accuracy? You could use R7 and R9. The question is which is the best one and when to use it, depends on where you are in the bell curve.

**Dr. Snow:** We're getting off the presentation subject. I recommend you contact Dave Warde directly with questions.



## **Agenda Item: Presentation: Effects of Interference on NEXRAD**

Presenter: Chris Curtis and Brad Isom, NSSL

### **Questions and Comments:**

**J. Evans:** Pulse interference case, notice your holding the INR steady, when in reality the ASR will be spinning, so the INR will only peak at main low to main low coupling. So in a sense, you may be overstating the impact of the interference on operational radars.

**Response from C. Curtis:** We did not see that as part of the scope of this study. You do of course have to take the coupling of the antennas. You don't know where it is going to happen, even if there is a little pulse effect.

**J. Evans:** In practical terms, it's hard to quantify, the scope of the study was narrow, you need to go the next step. If you use the low values, you will be seeing interference all of the time. Isn't that a problem?

Audience answer: often yes

**J. Evans:** The NEXRAD RVP8 doesn't have a filter or it does but it is left off, the TWR has the filter and uses it.

**Dr. Snow:** That is something for the ROC to look into.

**D. Zittel:** Who was the report submitted to?

**Response from C. Curtis:** It was submitted to the Spectrum Office. It may be submitted to an international meeting, but there has been some turnover at the Spectrum Office. We are not sure how this will impact it for presenting it at the international meeting in 2015.

**D. Zittel:** 12 years ago when we did a study, the results were very similar to what Chris and Brad came up with. We used real data and they used simulated data.

## Executive Session:

### Attendees:

Bill Bumgarner (Phone)  
Terry Clark  
Lee Crowley (Phone)  
Lt Col Neil Edens  
Jim Evans (Phone)  
Richard Ice  
Michael Istok (Phone)  
Todd Pattison (Phone)  
Dennis Roofe  
Dr. John Snow  
Dr. Zapotocny (Phone)

PSA: Kelly Thomason

### Decision Brief: Met Signal/Precip Non-Precip Algorithm, John Krause

**Vote and Comments:** The vote was unanimously approved with comment: The science is good. Concerns about implementation are left to the ROC.

**Vote Summary: Yes 8, No 0**

**Comment:** Would this modify the base data?

**R. Ice:** No

**B. Bumgarner:** HCA would be effective. This is an implementation issue. My recommendation would be yes, if it does not affect the HCA data or Dual Pol data.

**R. Ice:** Goes along with Dr. Snow's recommendation, the science works, but the implementation needs to be worked out. The ROC would handle that, but it does need to be done.

Snow: The science is ok.

**B. Bumgarner:** The science is fine, we don't want it to affect other algorithms.

**Dr. Snow:** Is there anyone who has an objection to the science?

**R. Ice:** It would have been nice to see some quantitative evidence. It could be done, but it takes time. John K. presented a number of cases which was good, just needs more quantitative evidence. We did this previously with the precip algo in build 10. We had extensive quantitative review, we really need that here.

**B. Bumgarner:** Recommend some quantitative effort be put forth.

**Dr. Snow:** The science that we saw is good. We would like to see examples of quantitative vs real data against gauges. Secondly, this should be considered for implementation, but there are concerns that this be evaluated by the ROC and how it affects other products. It needs to be done before it is sent to the field. Implementation should not be halted, but quantitative analysis should be done in conjunction with.

**Presentation: Advances in Spectrum Width Estimation, Dave Warde**

**Dr. Snow:** Interesting how they took previous guidance from previous TAC. Shows potential for future.

**R. Ice:** I invited Greg-NCAR because of his previous work. Specifically on the hydro spectrum width estimator. I thought Dave's ideas were interesting. Would be good for NSSL and NCAR to work together in future on spectrum. The two organizations (NSSL/NCAR) could provide synergy on the subject.

**Dr. Snow:** I concur.

**R. Ice:** NSSL and NCAR previously had an MOU for them to work, but that is no longer in effect.

**Presentation: Effects of Interference on NEXRAD, Chris Curtis and Brad Isom, NSSL**

**Comments:** Submit additional comments or questions by email due to late submission of presentation. Please send to Lt Col Edens by next Wednesday.

**Dr. Snow:** Any comments here today?

**B. Bumgarner:** There shouldn't be that much interference. Comments from audience stated otherwise. Rich, please verify.

**R. Ice:** The vast majority of long term open problems are interference, most of the problem is pulse, not zdr. Glenn Secrest and Lynn Almon do most of interference in ENG; working in conjunction with Apps.

**Dr. Snow:** I remember previous problems in previous years. Especially with growth of Cell phone industry. Problem will grow over time; perhaps not thorough enough or detailed enough.

**R. Ice:** This was a tasker from HQ. Pulse interference is very difficult to diagnose, it does fall within requirements. It would be good to reiterate requirement for sensitivity.

**???:** Reporting interference ratios, without taking into account spikes, is a problem. We use our filters in the TDWR and it helps.

**Dr. Snow:** Why do we not use the filter on the NEXRAD.

**R. Ice:** Before sigmet, we used one, now we do not based on Dale Sermons study. We decided not to use it because the data would be deleted. The thought was it is better to have bad data then none. Should look and see if this is still valid with sigmet in place. Revisit turning the filter on for SLEP.

**Dr. Snow:** Make recommendation to ROC. Evaluate / understand why current filter system was not implemented. What are alternatives based on what we are experiencing.

**R. Ice:** Talk to FAA about their experiences.

**ACTION:** Revisit turning the filter on for SLEP. Examine what the FAA does.