

NASA EARTH SCIENCE DIVISION
NNH08ZDA001N-DECISIONS
Decision Support through Earth Science Results (Decisions 2008)
Panel Summary Review Form

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Proposal Number: 08-DEC08-0061

Proposal Title: Applying NASA Observations and Models for Air Quality:
DSS for the Exceptional Event Rule.

SUMMARY OF PROPOSED RESEARCH: (2-6 sentences. In your own words, summarize the actual applied science activity proposed; note major objectives, approaches, and the results you would expect.)

This proposal is well focused towards developing a new, needed and specific DSS with EPA to define and manage documentation of the Exceptional Event Rule, which will serve as central portal of satellite, ground observations and model predictions for AQ application. The goal of the proposal is to reduce the level of effort of the states and EPA in assessing whether an exceedance is due to an exceptional event from about a week to less than four hours.

EVALUATION

1) RELEVANCE TO NASA'S OBJECTIVES (Includes NASA goals, specific NRA objectives for Decision Support through Earth Science Results (Decisions 2008))

Rating (check one): **E** **VG** **G** **F** **P**

Strengths:

This is highly relevant to the Air Quality call under Decisions-2008. Support GEO efforts. Supports interoperability between agencies. Uses MODIS, OMI, CALIPSO and especially GIOVANNI to provide documentary support for the rule.

It will provide a tangible use of NASA satellite measurements to improve understanding of air quality events. It is very responsive to a new EPA development (exceptional event exception) and potentially can make great use of NASA satellite data.

Weaknesses:

The connection between the information collected by DST and end users is not well described and cannot be easily understood by the panel.

2) INTRINSIC MERIT (Includes merit and methods of the proposed work; investigator qualifications; institutional capabilities; and significance of applied uses and outcomes.)

Rating (check one): **E** **VG** **G** **F** **P**

Strengths:

This team consists plenty of expertise in the community and is well qualified for the project. Husar has a long track record with EPA, NOAA, NASA and particularly the Applied Sciences Program. Leptoukh is the right individual in NASA to further the dissemination of NASA products. Schictel, Westphal, Falke and McHenry bring tremendous strength to the proposal.

The scientific focus of the proposal is sound but challenging. Identification and description of EE's will be relatively easy and easily automated through the federation of analysts. Whether a wiki or mail list, the identification of such events has blossomed over the last few years (Fromm's pyroCB list and Kruegers's Volcanic list are good examples of such event warning systems). The HMS system at NOAA is another example of such a successful identification tool.

The most difficult part of the DSS will be the quantification of the EE and whether there would still be an exceedance if the event did not occur. Correlation of PM to AOD for example could aid in this but whether this would be sufficient for regulatory compliance is a risk. Nevertheless, it would be a good test of McHenry's and Westphal's models at the same time. It would seem to the panel that it is worth the risk even if this part of the EE DSS were not accepted by EPA.

The purpose of EE reporting system is to provide a communications system for the state and local air quality agencies to prepare and submit EE reports to EPA, and for EPA to evaluate and judge these EE reports. The EE rule is expected to increase the numbers of air quality professionals who will do episode analysis by creating an incentive for avoiding violations of federal air quality standards. Having an EPA sanctioned web system that facilitates EE analysis and has access to satellite remote sensing data will likely increase the use of such data.

Weaknesses:

It was not entirely clear what else would be done to DataFed to enhance it for EE analysis. In the proposal, it states that "We are proposing that general event analysis to be conducted by a virtual community of analysts." It is not clear what is virtual about this community other than they may or may not exist. Ultimately, someone must qualitatively call an EE or else there needs to be an objectively analyzed system to create the flags. Neither of which is well described in the proposal.

The "community of analysts" sitting at the workstations would be expected to be the State and local forecasting community. Would they (1) have time to participate in posting to a wiki and (2) even care about posting to the wiki? If there were some commitment on the part of WRAP, for example, to say that its forecasters would contribute, this would have been better. Contribution of AIRPACT-3 analyses to the data sources is one thing, having the analyst provide interpretation is more important.

There is an unfortunate amount of interoperability jargon in this proposal and the panel is not sure if it is really needed or fluff. It is unlikely that the "system" will write the EE

reports. They will provide a report structure that is acceptable to EPA but still a human being will have to evaluate content.

Unfortunately, later part of the proposal that describes Technical Details is too vague and hence very difficult to evaluate. For instance, the cover page refers to OMI NO₂, yet nowhere else in the proposal is OMI NO₂ mentioned. The phrase "plume height", which is critical for assessing AQ impact of fires, does not appear (at all!) in the proposal. It is unclear how the various pieces described on pages 8 to 10 will come together. Page 12 states "AQ models that assimilate various observations could serve as effective data integration platforms. Unfortunately, the science and technology of such data assimilation is in its infancy". While these statements are true, this proposal does little to show how this situation will be advanced. The Combined Air Quality Trajectory Tool (CATT) has great promise but is not described in enough detail to be evaluated (page 17). If the statement on page 9 is correct. "GIOVANNI will enable air quality scientists to identify regional air pollution sources and sinks", then the specific value added by this proposal is lacking.

3) REALISM AND REASONABLENESS OF PROPOSED COST

Rating (check one): E VG G F P

Strengths:

Costs for this proposal are reasonable and bring high value personnel to the effort. This proposal is one that trains new personnel as two students are expected to be supported under this effort.

This proposal claims (and the claim seems realistic) that the system will save considerable agency time in preparing the EE reports.

Weaknesses:

The track record for proposals which involve highly interoperable systems is that they get a lot done but never get finished. It is not clear when this is 'finished', who will own it? Are there going to be followed on costs to NASA to get it moved to an operational environment?

The management plan and budget sheets make it very difficult to account for the costs. The budget justification section (pages 41 and 42) is very lacking, in that a lot of the costs apparent in the budget sheets are not accounted for.

OVERALL EVALUATION: 3.4

Rating (show panel distribution): E VG G F P

Rationale:

This proposed project will provide a unique source of satellite observation and operational model results all from one central portal for AQ application. However, the values of the project will greatly increase, if the proposers could also provide automated

tools, which will merge all satellite and model information for subsetting (such as over a city or regions) at user's demand, particularly for decision making processes.

Possible support at a reduced level if further details about how satellite data will be used and how the various pieces will come together can somehow be provided, and if the budget can be understood.

The question is whether NASA's interest in promoting the use of satellite data for public policy decisions is sufficient to justify building this system from pieces that already use such data, but by revamping it to explicitly address EE issues expanding the numbers of users. The panel would have been more impressed if EPA, who has the most to gain by such a system, showed their commitment by co-funding this proposal.

ADDITIONAL COMMENTS AND SUGGESTIONS FOR PROPOSERS:

The proposal writing seems to be sloppy. There are lots of typos and grammar errors throughout the proposal. Clearly parts were hurried, as evidenced by the editorial comments that remain on page 22.