NATIONAL WEATHER ASSOCIATION

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April 2, 2004

Mr. Gregory W. Withee
Assistant Administrator for Satellite and Information Services
National Environmental Satellite, Data and Information Service, NOAA
1335 East-West Highway
SSMC1 Room 8338
Silver Spring, Maryland 20910-3226

Dear Mr. Withee:

The National Weather Association (NWA) requests your advocacy for a Lightning Mapper Sensor on future geostationary operational environmental satellites.

The NWA is a member-led, non-profit professional organization supporting and promoting excellence in operational meteorology and related activities. Excellence in daily weather observing and forecasting for the public good can best be achieved by continual modernization of observing equipment and by taking advantage of new technologies as soon as possible.

The members of the NWA committee on Remote Sensing have been monitoring satellite observing capabilities and keeping up with literature, technical presentations and testing regarding future opportunities. The committee members recently brought to my attention the need to express support and excite advocacy for the Lightning Mapper Sensor. A letter of support was developed and approved with the advice and consent of the NWA elected Officers and Councilors.

I invite you to read the enclosed Letter of Support and hope you will enthusiastically advocate in all ways possible the inclusion of a Lightning Mapper Sensor (LMS) on GOES-R, and if possible, an earlier demonstration geostationary platform, as soon as feasible.

Thank you very much for your consideration.

Sincerely,

Original Signed

Paul J. Croft, Ph.D.
President

Enclosure

National Weather Association
Letter of Support

GOES Lightning Mapper Sensor (GOES – LMS)

The National Weather Association (NWA) is a member-led, non-profit, professional organization supporting and promoting excellence in operational meteorology and related activities. Excellence in daily weather observing and forecasting for the public good can best be achieved by continual modernization of observing equipment and taking advantage of new technologies as soon as possible. Therefore, on behalf of the over 3,000 NWA members from all sectors of the meteorological community, the NWA President with the advice and consent of the NWA Council requests the support of all concerned for the inclusion of a Lightning Mapper Sensor (LMS) on GOES-R, and if possible, an earlier demonstration geostationary platform, as soon as feasible. The highly unique LMS sensor would allow for continuous monitoring and observation of thunderstorms over the Continental United States and southern Canada, portions of the Atlantic and Pacific Ocean basins including Puerto Rico and other islands in the field of view, and Central and South America.

The LMS observations of total lightning from GOES would provide a continuous "snapshot" of a storm's convective vigor, growth, and decay not possible with existing satellite imagers, weather radars, or cloud-to-ground lightning networks. The ground-based National Lightning Detection Network can only observe cloud-to-ground (CG) lightning over the Continental United States, southern Canada, and adjacent coastal waters. The highly sensitive Charge Coupled Device detector array on the LMS will also allow discrimination of lightning from bright background surfaces such as sunlit clouds during the daytime, resulting in a 24-hour-a-day detection capability.

Research continues to indicate that LMS measurements would provide vital information that could help the operational weather, aviation, disaster preparedness, and fire prevention communities in their support of commerce, transportation, security and public safety:

(1) Potential for increased lead times and reduced false alarms for warnings of severe thunderstorms and violent tornadoes (Goodman et al. 1988; Williams et al. 1999; Buechler et al. 2000)

(2) More reliable warnings of CG strikes, resulting in reduced fatalities and injuries, economic benefits to electrical utilities and consumers (Weber et al. 1998)

(3) Improvements in the initialization of numerical weather prediction models by better identification of deep convection (Alexander et al. 1999; Chong et al. 2001)

(4) Better forecasts of forest fire initiation by identification of long duration, continuing-current lightning discharges with dry thunderstorms (Weber et al. 1998)

(5) Improved routing of commercial, military, and private aircraft over the Continental United States (Seliga et al. 2002) and oceanic regions (Weber et al. 1998) where observations of thunderstorm intensity are currently scarce

(6) Support for spacecraft launches and landings, which are critically dependent on absence of both CG and in-cloud lightning

(7) Greater ability to monitor intensification or weakening of storms during radar outages, or where radar coverage is poor, such as in mountainous areas (Weber et al. 1998)

(8) Potentially improved short range forecasts of heavy rainfall and flash flooding (Weber et al. 1998)

(9) Identification of heavy convective snowfall ("thunder-snow") (personal communication, Dr. Patrick Market 2003)

(10) Improved ability to monitor the intensification of tropical cyclones, which are often accompanied by increased eyewall lightning activity (Weber et al. 1998)

(11) Updates and derivations of lightning and heavy rainfall climatology within the GOES field-of-view for improved depiction of spatial and temporal variations that may have climatic significance

(12) Advances in lightning research (e.g., studies of cloud-to-cloud lightning, stratospheric sprites, and elves)

A prior cost-benefit study on a future GOES LMS (Weber et al. 1998) estimated that this instrument could prevent approximately 10 convective weather related fatalities, 150 injuries, and $40 million in property damage and business operating costs per year. These monetized savings would significantly exceed the costs of the sensor. As a first step, we recommend that NOAA, NASA, Department of Defense, and private industry work together to implement this new sensor as an "Instrument of Opportunity" on the first available GOES, and then plan for subsequent operational status on the advanced GOES-R series. Even prior to a GOES deployment, a demonstration geostationary LMS would result in valuable risk-reduction activities, including the assessment of data delivery, product development, and decision-making capabilities.

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