



CURRENT AND PLANNED DEVELOPMENT OF ENHANCED CLOUD PRODUCTS

In response to CGMS Recommendation 33.03

NOAA outlines its current and planned activities to improve their ability to estimate cloud properties including cloud microphysics from satellite imager data. These techniques include improvements in the NOAA operational AVHRR cloud processing system (CLAVR-x). The system has adopted the latest models for ice crystal scattering developed for the NASA Goddard MODIS cloud products. In recognition of the need to monitor cloud microphysics throughout the day, NOAA has developed infrared-only approaches to estimate cloud optical thickness and cloud particle size. In recognition of the need to monitor cloud microphysics throughout the day, NOAA continues to develop methods to optimally combine imager and infrared hyperspectral sounder data for optimal cloud product generation.

NOAA Response to CGMS XXXIII Recommendation 33.03

1 INTRODUCTION

CGMS Recommendation 33.03: Members are encouraged to pursue the development of enhanced cloud products including cloud microphysics, recognising the GCOS requirement for improved cloud monitoring.

2 Current and Planned Development of Enhanced Cloud Products

At NOAA/NESDIS Center of Satellite Applications and Research (STAR), NOAA has undertaken the following activities to improve our ability to estimate cloud properties including cloud microphysics from satellite imager data.

- The NOAA operational AVHRR cloud processing system (CLAVR-x) has adopted the latest models for ice crystal scattering developed for the NASA Goddard MODIS cloud products. Studies have shown that physical consistency between the two sets of cloud properties is greatly improved through the adoption of standard scattering models. An example of the current operational AVHRR cloud optical depth and cloud effective particle size is shown in Figure 1.
- In recognition of the need to monitor cloud microphysics throughout the day, NOAA has developed infrared-only approaches to estimate cloud optical thickness and cloud particle size. These methods are applicable at all times of day owing to their lack of dependence on solar reflection. NOAA is currently verifying the consistency of these IR-only approaches with the commonly used day-time only approaches.
- Given that the future polar orbiting and geostationary imagers will have limited spectral information in absorption bands, NOAA continues to develop methods to optimally combine imager and infrared hyperspectral sounder data for optimal cloud product generation. Our current studies are focused on the NPOESS program where the planned imager (VIIRS) will lack any infrared observations in water vapor or carbon dioxide bands.

