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SSF Switch from Cloud Categories to Cloud Layers

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Purpose:

The purpose of this bulletin is to record a change on the Release 2 SSF data product which impacts many of the subsystems which follow subsystem 4.

Introduction:

The SSF data product has been redefined to contain cloud information for up to two distinct cloud LAYERS. Previously, the SSF contained cloudy footprint data for up to two of the four cloud CATEGORIES. Bruce Wielicki, Bruce Barkstrom, and the Working-Group chairmen reexamined cloud categories at the footprint level and decided that cloud layers are more appropriate. Placing the cloud layers into a vertical grid, or cloud categories, will be implemented at the region level by TISA.

Richard Green has written a detailed paper describing the sorting of imager pixel data into cloud layers. Those interested in these details should contact Richard for a copy of the paper.

Discussion:

The SSF subsystem will now contain cloud properties for up to two cloud layers per Field of View (FOV). If the FOV is clear and contains no clouds, both cloud layer area percent coverages will be set to 0 and the cloud layer properties which follow will be set to CERES defaults. If the FOV contains only one layer, it will be located in the first slot. In the one cloud layer case, the cloud layer area percent for the second layer will be set to 0 and the associated cloud layer properties will be set to CERES defaults. FOVs which contain two layers will always have the lowest layer located in the first array slot. By definition, a FOV may only have up to two layers recorded. If more layers are present, they will be averaged in with the closest layer using the algorithm defined in Richard Green's paper. Separate cloud layers are defined as having an effective pressure gap of at least 50 hPa between them and having at least 3 imager pixels within the layer.

The SSF cloudy footprint area, parameters 73 - 103, will no longer apply to cloud categories, but rather to cloud layers. The overlap footprint area, parameter 104, will also be redefined based on cloud layers. The first element remains clear area percentage. The remaining elements become layer 1 area percentage, layer 2 area percentage, and layer 2 over layer 1 area percentage, in that order.

The TISA subsystem will assume responsibility for combining layers which fall within the same cloud category and placing the layers in the proper cloud category. The cloud categories

make up a vertical grid which is consistent with ISCCP and allows cloud overlap conditions to be handled consistently. The category boundaries have been selected with care so that fewer clouds straddle the boundaries. It is extremely important that TISA and the future ADMs have consistent cloud categories.

The ATBDs for Clouds and TISA will be rewritten to reflect these changes when the next round of ATBD revisions are due.