

NASA Technical Memorandum 2003–206892, Volume 22

SeaWiFS Postlaunch Technical Report Series

Stanford B. Hooker, Editor

NASA Goddard Space Flight Center, Greenbelt, Maryland

Elaine R. Firestone, Senior Scientific Technical Editor

Science Applications International Corporation, Beltsville, Maryland

Volume 22, Algorithm Updates for the Fourth SeaWiFS Data Reprocessing

Frederick S. Patt, Robert A. Barnes, Robert E. Eplee, Jr., Bryan A. Franz,
and Wayne D. Robinson

Science Applications International Corporation, Beltsville, Maryland

Gene Carl Feldman

NASA/Goddard Space Flight Center, Greenbelt, Maryland

Sean W. Bailey and Joel Gales

Futuretech Corporation, Greenbelt, Maryland

P. Jeremy Werdell

Science Systems and Applications, Incorporated, Lanham, Maryland

Menghua Wang

University of Maryland, Baltimore County, Baltimore, Maryland

Robert Frouin

Scripps Institution of Oceanography, La Jolla, California

Richard P. Stumpf

NOAA Center for Coastal Monitoring and Assessment, Silver Spring, Maryland

Robert A. Arnone, Richard W. Gould, Jr., and Paul M. Martinolich

Naval Research Lab, Stennis, Mississippi

Varis Ransibrahmanakul

SPS Technologies, Silver Spring, Maryland

John E. O'Reilly

NOAA National Marine Fisheries Service, Narragansett, Rhode Island

James A. Yoder

University of Rhode Island, Narragansett, Rhode Island

Chapter 6

Masks and Flags Updates

WAYNE D. ROBINSON, BRYAN A. FRANZ, AND FREDERICK S. PATT
Science Applications International Corporation
Beltsville, Maryland

SEAN W. BAILEY
Futuretech Corporation
Greenbelt, Maryland

P. JEREMY WERDELL
Science Systems and Applications, Incorporated
Lanham, Maryland

ABSTRACT

The flags and masks used for the SeaWiFS level-2 and level-3 processing were updated for the recent fourth reprocessing. This chapter discusses the changes and why they were made. In many cases, underlying algorithms were changed. Some flags changed their states to either flagging (noting a condition), or masking (denoting data excluded from the product) to allow more data to be kept or to improve its quality. New flags were either introduced as a part of new algorithms or to denote the status of the data more clearly. The flag and mask changes significantly contributed to the improvement in the data quality and increased the amount of data retrieved.

6.1 INTRODUCTION

As part of the algorithm improvements for the fourth reprocessing, several improvements were made in the flagging and masking done in the level-2 and level-3 SeaWiFS data processing. Table 6 shows a list of the current flags used in the fourth reprocessing, their status in operational processing as a flag (to note a condition) or a mask (to note that the data are excluded from the product because of this condition), a brief description of the flag, and a general indication of how this flag changed from the third to the fourth reprocessing. Three general classes of change are noted.

For many flags, the underlying algorithm that generates the flag was changed. In all these cases, the new algorithm is an improvement over the old algorithm in that it characterizes the flag condition better, and in some cases, is able to allow for a greater number of good retrievals to be made. In Table 6, this is denoted as a change.

Some flags had their status as a mask or a flag changed for the fourth reprocessing. Many times, this change was a direct result of the algorithm changes referred to above. Other changes were prompted by increased experience with the operation of the flag, which revealed the data quality or amount of retrieved data would be increased with the

new masking. Table 6 notes cases in which data previously masked are now flagged, or vice versa. The changes in masking and flagging are noted for the level-2 and the level-3 product. For the level-3 product, there is no actual flag for the data. In the case where the change in flag status is denoted as *flagged*, it really means that the data which were previously excluded from the level-3 product are now included as a part of the product.

Finally, four new flag conditions were added to the list of flags. These denote either new general conditions, or are part of new algorithms, or are used to more clearly separate conditions that occur during the level-2 processing. In Table 6, they are denoted as new flags.

The following sections describe the flag and mask changes in more detail. Section 6.2 describes an analysis to determine the effect of individual level-3 masks on the number of retrievals. Section 6.3 describes the changes in the flagging and masking for the level-2 product, Sect. 6.4 looks at the changes in the masking for the level-3 product, and Sect. 6.5 summarizes the changes.

6.2 FLAG EFFECT ANALYSIS

Most of the flag and mask changes came naturally from the increased understanding of the SeaWiFS data.