Ocean Observer Satellite Study: Instrument And Satellite Constellation Architecture Options

Andrew J. Gerber, Jr.
California Institute of Technology
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109
Tel: (818) 354-2172, Fax: (818) 393-9815, Email: agerber@mail2.jpl.nasa.gov

James McGuire
NASA, Integrated Program Office E/IP
Room 1450 Centre Building, 8455 Colesville Rd., Silver Spring MD 20910-3315
Tel: (301) 427-2121 X127, Fax: (301 427-2164, Email: James.Mcguire@noaa.gov

John D. Cunningham
NOAA/NESDIS, Integrated Program Office E/IP
Room 1450 Centre Building, 8455 Colesville Rd., Silver Spring MD 20910-3315
Tel: (301) 427-2070, Fax: (301) 427-2164, Email: John.D.Cunningham@noaa.gov

William.G.Pichel
NOAA/NESDIS, Office of Research and Applications E/RA3
Room 102 WWBG, 5200 Auth Road, Camp Springs, MD 20746
Tel: (301) 763-8231 X 166, Fax: (301) 763-8231, Email: William.G.Pichel@noaa.gov

Abstract

During the past two years, operational measurement requirements for the future U.S. operational environmental satellites have been extensively revised. These requirements specify the operational measurements to be made from the National Polar-Orbiting Operational Environmental Satellite System (NPOESS) which is planned for the 2008 to 2018 time period. NPOESS meets the operational needs of the U.S. civilian meteorological, environmental, climatic, and space environmental remote sensing programs, and the Global Military Space and Geophysical Environmental remote sensing programs. This system, however, does not meet all the needs of the user community interested in operational oceanography (particularly in coastal regions) and hazard response.

In the later half of the year 2000, the Integrated Program Office (IPO) initiated the Ocean Observer Study (OOS). The purpose of this study is to: (1) determine what additional ocean (particularly coastal ocean) and hazard observations from space are needed in the 2008 to 2023 time period; (2) turn those needs into requirements; (3) examine instrument and satellite constellation options to meet these requirements, and (4) estimating the costs for building an ocean observation satellite system.

This paper provides: (1) an overview of the set of active and passive instruments identified by the IPO designed to make the ocean measurements including visible and infrared medium and high resolution imagers, radiometers, altimeters, and synthetic aperture radars, (2) the instrument and satellite constellation architecture options studied, and their ability to meet the set of measurement requirements and (3) an estimate for the cost of an ocean observation satellite system versus its ability to meet the set of measurement requirements.