

## **Geostationary Satellite Coverage for the Pacific Region**

This paper is a response to CGMS XXXI Action Item 31.02.

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### **1. Introduction**

As the first satellite launched in the GOES I-M series, GOES-8 has had a very long and successful operational life. It was launched on April 13, 1994. After a Post Launch Test period, it was placed in service in November 1994 at 75 degrees West longitude, which is approximately the longitude of Washington, D.C. This location is called the GOES-East location, since it has the best view of the Eastern and Central U.S., plus the Caribbean and western Atlantic Ocean, where hurricanes are born.

GOES-8 was in service in the GOES-East mission from November 1994 to April 2003. The original design lifetime for GOES-8 was 5 years, so the actual service lifetime was much better than expected. GOES-8 observed all the hurricanes for the seasons of 1995 through 2002.

The primary new feature of GOES-8 was the 3-axis stabilized design, which allowed us to take images of small parts of the Western Hemisphere in addition to full disk images. This capability permitted zeroing in on hurricanes for rapid movie-type images, or taking many images of the United States in one hour when severe weather threatens. In addition, GOES-8 has a Sounder instrument, which makes temperature and humidity measurements at many depths in the Earth's atmosphere, for input into computer models for weather prediction.

### **2. GOES-8 Deactivation**

On May 4 and 5, 2004, GOES-8 will be boosted to super-synchronous orbit via three planned de-orbit maneuvers. The first mane On May 4 and 5, 2004, GOES-8 will be boosted to super-synchronous orbit via three planned de-orbit maneuvers. The first maneuver is scheduled for May 4 at 1400z for 73.9 seconds, the second one is scheduled for May 5 at 0200z for 150.0 seconds, and the third one is scheduled for May 5 at 1400z for 81.3 seconds. For a geosynchronous satellite, the de-orbiting operation entails raising the orbit up so that it is more than 350 kilometers above the geosynchronous altitude (in a location that will not cross the path of any other operational geosynchronous satellite).

This satellite is being de-orbited for two primary reasons. GOES-8 does not have sufficient propellant to properly provide for station keeping maneuvers (it essentially has just enough propellant to de-orbit the spacecraft). Additionally, the loss of critical on-board subsystem redundancy for some major subsystems over the last ten years has introduced enough risk to discourage the prolonged operation of GOES-8.

### 3. GOES I-M Series

The five GOES I-M series satellites were launched from 1994 to 2001. The next series of GOES spacecraft will be the GOES NOP series, to start in late 2005. These will use the same Imager and Sounder instruments as for GOES I-M, but will use star trackers instead of Earth sensors for attitude control, so they will provide better image pointing accuracy than GOES I-M. Starting in 2012, the GOES-R series of spacecraft will have new instruments, and will offer twice the image resolution of the GOES I-M series, with true color visible image capability, 16 imager wavelength channels instead of 5, providing views of many more layers and gases in the Earth's atmosphere. In addition, the GOES-R Hyperspectral Environmental Suite (HES) will provide hundreds of channels of Sounder data for very high quality data on temperature and humidity at different heights in the atmosphere for input to computer models.