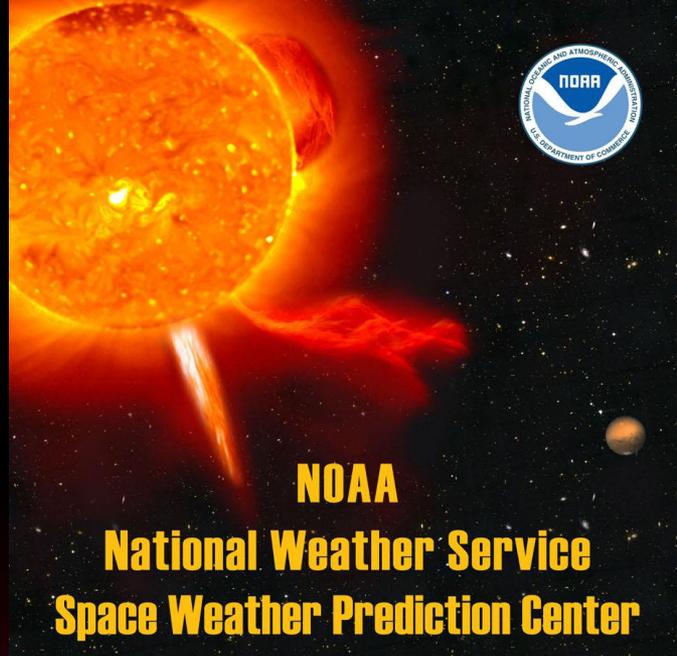


---

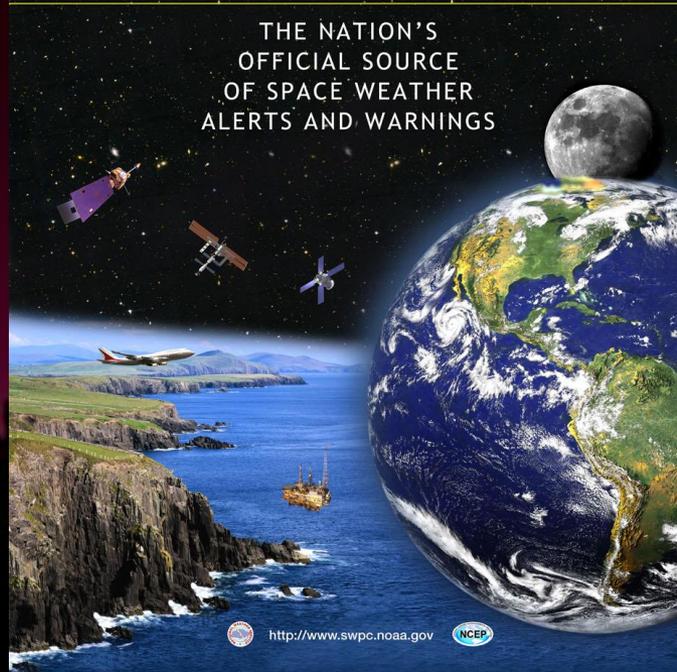
# SWPC Radiation Environment Services

---

*Bob Rutledge  
NOAA Space Weather Prediction Center  
Boulder, Colorado  
April 17<sup>th</sup>, 2013*



**NOAA**  
**National Weather Service**  
**Space Weather Prediction Center**



THE NATION'S  
OFFICIAL SOURCE  
OF SPACE WEATHER  
ALERTS AND WARNINGS



<http://www.swpc.noaa.gov>



# Radiation Environment Services

- Intent of the session
- What do we mean by Radiation Environment?
- Customers
  - Aviation
  - Space Operations
  - Satellites
- Current state of services
  - Data
  - Predictions, Warnings, and Alerts
  - State of modeling
- Where do the gaps exist?
- What are the true customer needs – radiation data or a derived product?
- What can we do to close those gaps?

# GOES NOP Particles

---

## **Magnetospheric Electron Detector (MAGED):**

9 look directions for (5 azimuth and 5 elevation with shared center)

5 energy channels in each look direction: 30 keV – 600 keV

## **Magnetospheric Proton Detector (MAGPD):**

9 look directions for (5 azimuth and 5 elevation with shared center)

5 energy channels in each look direction: 80 keV – 800 keV

## **Energetic Proton Electron and Alpha Detector (EPEAD):**

2 look directions (East and West)

3 electron energy channels:  $> 0.8$  MeV,  $> 2$  MeV,  $> 4$  MeV

7 proton energy channels: 0.7 – 900 MeV

6 alpha particle energy channels: 4 – 500 MeV

## **High Energy Proton and Alpha Detector (HEPAD):**

1 look direction

4 proton energy channels: 330 –  $>700$  MeV

2 alpha particle channels: 2560 –  $>3400$  MeV

# GOES R Particles

---

## Energetic Heavy Ion Sensor (EHIS):

- 1 look direction

- 10-200 MeV/nucleon in 5 bands

- 4 mass groups (He, CNO, Ne-S, and Fe group)

## Solar and Galactic Proton Sensors (SGPS):

- 2 look directions (East and West)

- 10 proton energy channels (1-500 MeV) + >500 MeV integral

- 10 alpha energy channels (4-500 MeV)

## Magnetospheric Particle Sensor-Hi (MPS-Hi):

- 5 look directions

- 10 electron energy channels (50 keV – 4 MeV)+ >2 MeV integral

- 7 proton energy channels (80 keV – 10 MeV)

## Magnetospheric Particle Sensor-Lo (MPS-Lo):

- 14 look directions

- 30 eV – 30 keV, 15 bands, electrons and protons (ions)

# ***NOAA Space Weather Prediction Center Boulder, Colorado***



*[www.spaceweather.gov](http://www.spaceweather.gov)*