The Solar Cycle 24 Consensus Prediction

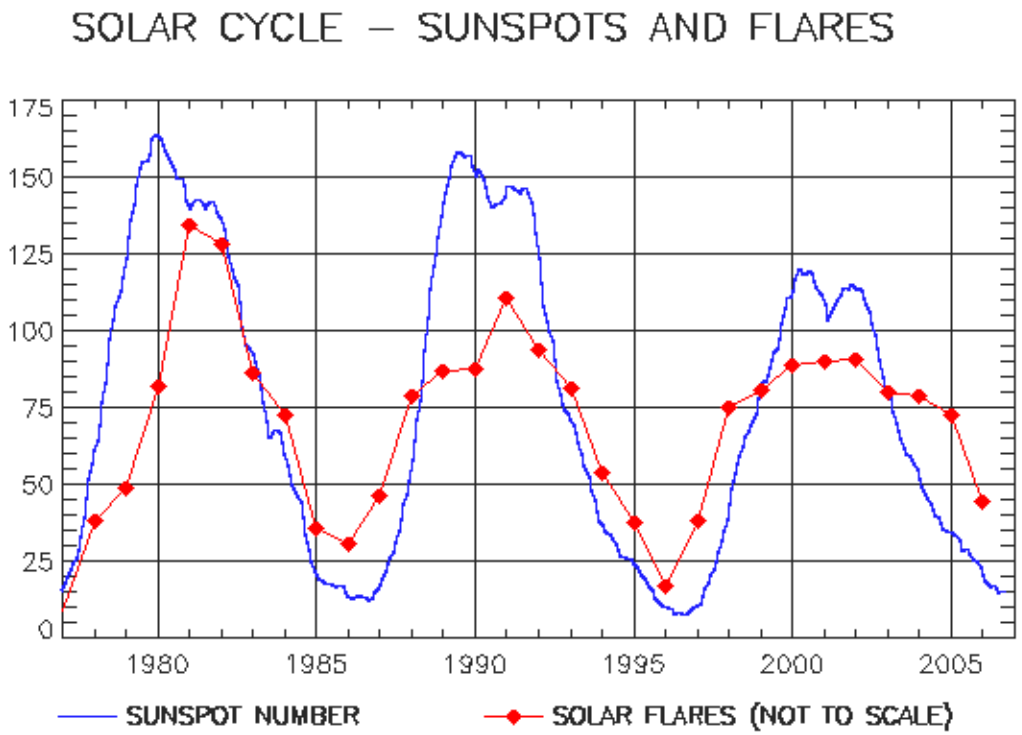
Douglas Biesecker (NOAA/SEC)
and the Solar Cycle 24 Panel

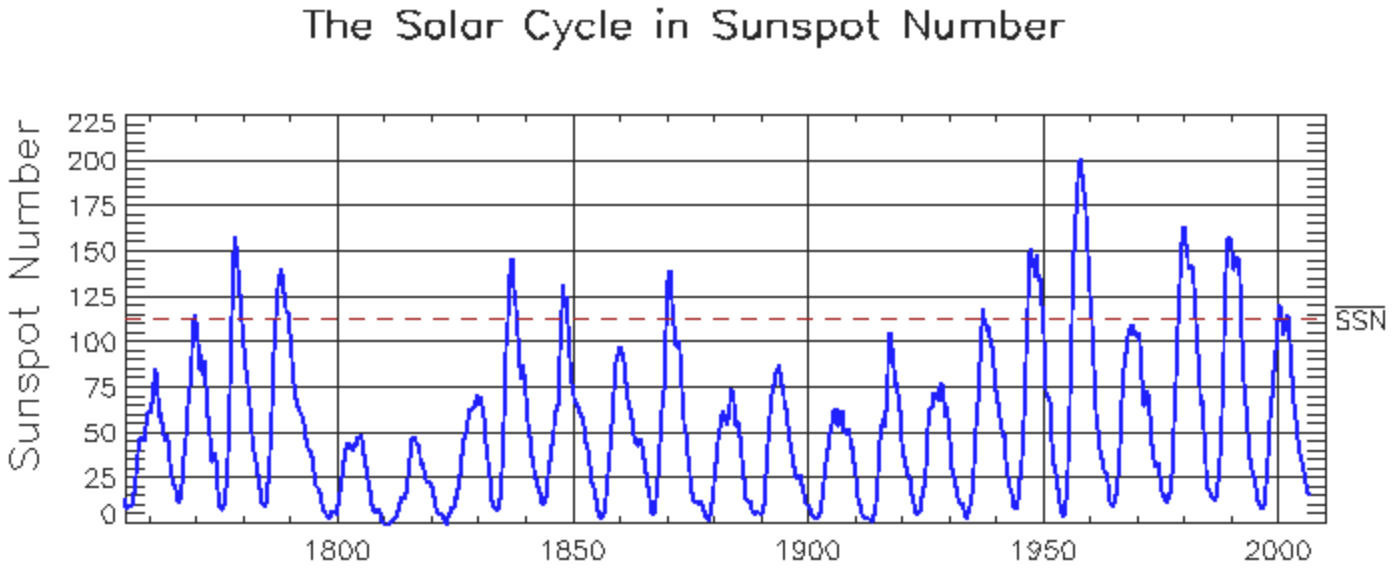
WHAT IS A SOLAR CYCLE?

Solar activity rises and falls over an 11 year cycle

- Can be shorter/longer
- Activity correlates with

  Sunspot Number





The Solar Cycle 24 Panel

- Charged with determining the official prediction for Solar Cycle 24 for NOAA, NASA, and the International Space Environment Service (ISES)
  - Time and intensity of solar cycle 24
    - Sunspot number
    - F10.7
- Panel chaired by NOAA, funded by NASA
  - Previous panels met in 1989 and 1996
- International membership
- The panel has 12 voting members
  - Only 11 voted on these predictions

The Panel

Panelist	Affiliation	Panelist	Affiliation
D. Biesecker	NOAA, Chair	**D. Pesnell**	NASA
M. Dikpati	NCAR	**M. Rast**	U. Colorado
K. Dowdy	USAF	**L. Svalgaard**	ETK Inc.
D. Hathaway	NASA	**R. Thompson**	IPS Australia
T. Hoeksema	Stanford U.	**R. Van der Linden**	Royal Obs. Of Belgium
E. Kihn	NOAA	**J. Kunches**	NOAA, ex-officio
H. Lundstedt	Swedish Inst. of Space Sci.	**O.C. St. Cyr**	NASA, ex-officio

The Consultants

Consultant	Affiliation	Consultant	Affiliation
P. Charbonneau	U. Montreal	**K. Strong**	Lockheed Martin
P. McIntosh	HelioSynoptics	**A. Tlatov**	Kislovodsk Solar Station, Russia
M. Penn	National Solar Observatory	**S. Tobias**	Leeds Univ., UK
J. Sanders	USAF	**R. Ulrich**	UCLA

The Panel is today releasing predictions for

- The impending solar minimum
  - Marking onset of Cycle 24
  - Provided basis for the other predictions
- The peak sunspot number expected for Cycle 24
- The time of the peak sunspot number

- What follows is the consensus of the panel

Solar Minimum Prediction

- **March, 2008** (±6 months)
  - Marks the end of Cycle 23 and start of Cycle 24
  - The length of Cycle 23 will then be 11.75 years
- due to the absence of expected signatures of minimum-like conditions in March, 2007
  - no high-latitude sunspots yet observed with the Cycle 24 polarity
  - the large scale corona has not yet relaxed to a simple dipole
  - the heliospheric current sheet has not yet flattened
  - activity measures, *e.g.* cosmic ray flux, radio flux, and sunspot number, have not yet reached typical solar minimum values

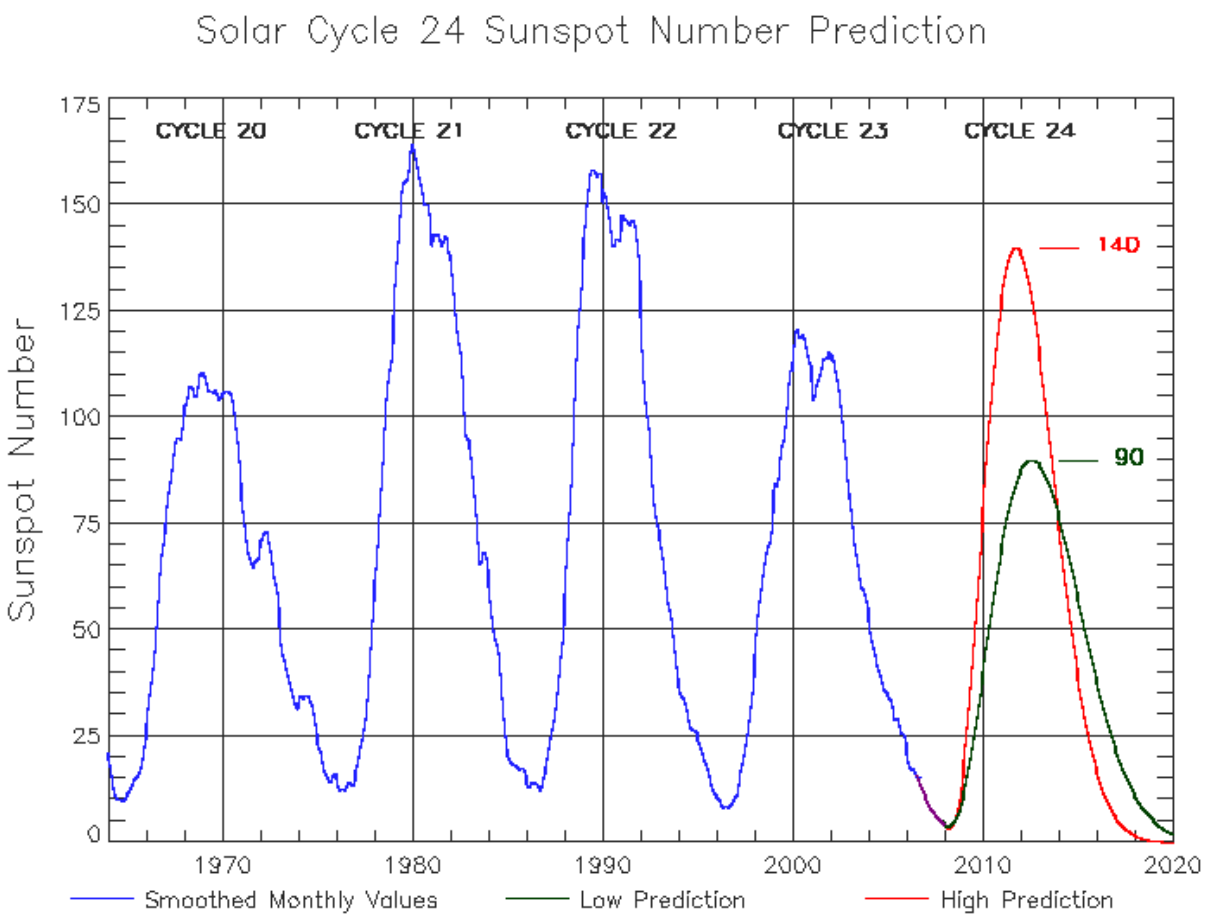
Cycle 24 Maximum Prediction

- Will peak at a sunspot number of **140(±20)** in **October, 2011** (F10.7 = 187 sfu)

Or

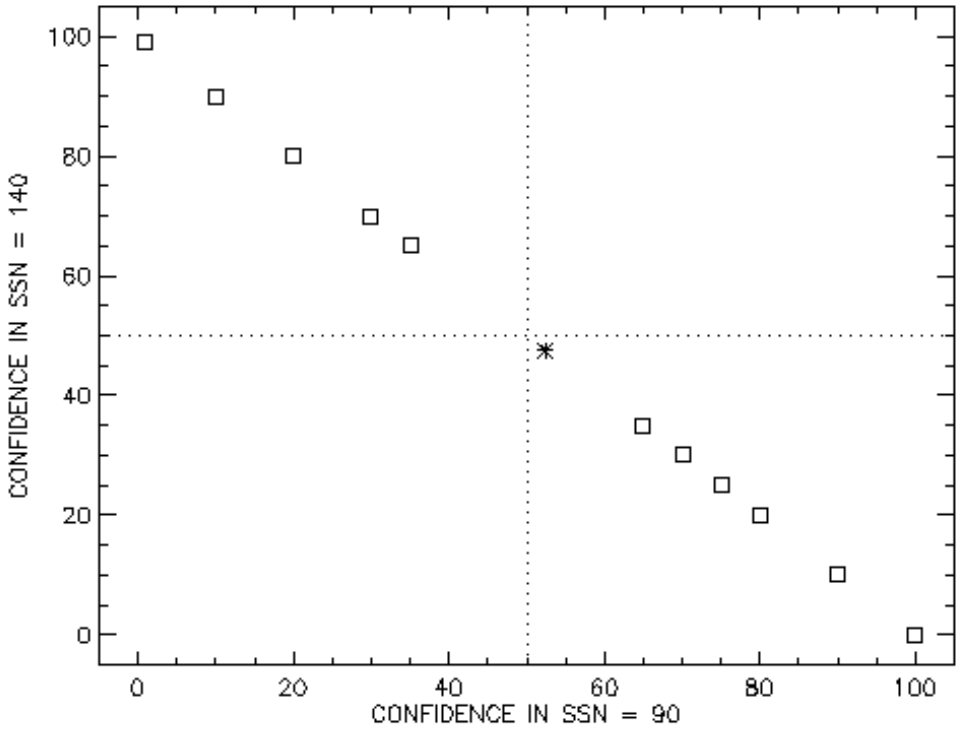
- Will peak at a sunspot number of **90(±10)** in **August, 2012** (F10.7 = 141 sfu)
  - **The panel is split!**
  - The next cycle will be neither extreme, nor average

The April 25 Prediction



How split is the panel?

- Voting came out 6-5
  - Favoring small
- Allowing voters to express their confidence in each prediction resulted in an even closer result
  - 5.8 to 5.2



A few comments…

- Why the panel still disagrees…
  - We're still a long way from solar minimum
    - 5-17 months based on panel prediction
- What's the main difference between the big (140) and small (90) predictions?
  - Big – assume solar memory lasts 20-30 years
  - Small – assume solar memory lasts 11 years
    - This is the view of the panel chair

What to watch for…

- What would cause the big predictors to think small
  - If solar minimum drags out beyond March, 2008
- What would cause the small predictors to think big
  - If either the magnetic field at the sun's poles increases in strength or geomagnetic activity increases before March, 2008

There is still work to do…

- The panel will re-evaluate conditions on the sun every 3 months
- The panel will update this prediction annually, or as things change.

- The Panel chair wishes to thank, Susan Baltuch, Ellen Martinez, and Eron Brennan for their support of the panel workshops held at UCAR in Boulder
- NASA for providing the funding of this effort
- The panel members, for working hard and with a very good spirit