The Societal and Economic Impacts of Severe Space Weather Events

D. N. Baker, LASP / University of Colorado
Howard Singer, NOAA SEC
Arthur Charo, National Research Council
An ad hoc committee of the Space Studies Board (SSB) of the National Academies will convene a workshop to assess the Nation’s current and future ability to manage space weather events and their societal and economic impacts.

- What are the socioeconomic consequences to the Nation of severe space weather events?
- How likely are events more intense than the 2003 Halloween storms and what might be the consequences of such events?
- Are there specific ground- or space-based sensors or other approaches that might mitigate or avoid the effects of future severe space weather events?

Support from NASA/SMD in place; other agencies likely
Approach

- Phase I: Workshop
  - Late October 2007
  - Representatives from academia, industry, and industry associations
    - Associations can aggregate data and avoid concerns about proprietary or competition-sensitive data
  - Analysis in specific areas: e.g., GPS, power industry, aviation, human and robotic exploration beyond low-Earth orbit
  - Econometric analysis of value of improved SpaceWx
Examples of Concerns

The advent of new long range aircraft such as the A340-500/600, B777-300ER and B777-200LR

Next 6 Years:
Airlines operating China-US routes go from 4 to 9
Number of weekly flights from 54 to 249

Next 12 Years:
1.8 million polar route passengers by 2018

Airlines and Space Weather

- Airborne Survey Data Collection: $50,000 per day
- Marine Seismic Data Collection: $80,000-$200,000 per day
- Offshore Oil Rig Operation: $300,000-$1,000,000 per day (Courtesy R. Barker)

Space Radiation Hazards and the Vision for Space Exploration

GPS Global Production Value—expected growth:
2003 - $13 billion
2008 - $21.5 billion
2017 - $757 billion

Industrial Technology Research Institute (ITRI) – Mar 2005
How to Measure the Value of Improved SWx Forecast?

- Identify decisions that can be improved using a reliable forecast
- Differences with and without forecast (the expected value of a forecast)
- When best design decisions are made
- Economic value of expected outcomes
Schedule

- Letter of request from NASA: January 2007
- Study approved by NRC: April 2007
- Between now and late October 2007
  - Formation of ad hoc study committee
  - Identify workshop sessions, session leads, and speakers
  - Hire consultant for the SWx economic analysis
- Potential Phase II study: TBD, 2008
Anticipated Benefits

Economic Impacts analysis will provide:

- Better guidance for policy makers on investment in SWx systems
- Better rationale for Agency budgeting
- Better understanding of “high-payoff” forecasts
- Clearer guidance for future human exploration
- Improved societal appreciation for SWx risks
Thank you—Questions?