

Project Details

ROSES ID: NRA-03-OSS-01

Selection Year: 2004

Program Element: Independent Investigation: LWS

Project Title:

The Sun's Role in Decadal Climate Change since 1980, and in the last Century

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Project Member(s):

- Lean, Judith L; COI; Naval Research Laboratory
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Summary:

The goal of this research is the empirical and modeling quantification of spatial climate patterns associated with decadal solar forcing, as distinct from ENSO, volcanic and greenhouse gas influences. A multiple regression of surface and satellite-based temperature data with the observed forcings will be done for the last 20 years, the time period covered by space-based data. The spatial pattern of the trend component may offer clues about its origin, specifically the relative importance of anthropogenic and solar forcings. The forcings/events will also be input to a high resolution climate/middle atmosphere model with chemistry to assess its responses for comparison with the observational record. The model will allow for a detailed evaluation of the potential response mechanisms. The analysis will then be extended to the past 100 years, and the patterns compared to the more recent data, to understand the consistency in response and the validity of the proposed forcings over this time (in particular the solar forcing). The research should provide new characterizations of contemporary regional climate responses to solar irradiance variations.

Publication References:

Summary: "

Reference: David Rind / Goddard Institute for Space Studies-The Sun's Role in Decadal Climate Change since 1980, and in the last Century

Summary: no summary

Reference: Lean, Judith L.; Rind, David H.; (2008), How natural and anthropogenic influences alter global and regional surface temperatures: 1889 to 2006, Geophysical Research Letters, Volume 35, Issue 18, CiteID L18701, doi: 10.1029/2008GL034864

Summary: no summary

Reference: Rind, D.; Lean, J.; Lerner, J.; Lonergan, P.; Leboissitier, A.; (2008), Exploring the stratospheric/tropospheric response to solar forcing, Journal of Geophysical Research, Volume 113, Issue D24, CiteID D24103, doi: 10.1029/2008JD010114

Summary: no summary

Reference: Lean, Judith L.; Rind, David H.; (2009), How will Earth's surface temperature change in future decades?, Geophysical Research Letters, Volume 36, Issue 15, CiteID L15708, doi: 10.1029/2009GL038932

