OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 01/31/2026)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: John D. Horel

eRA COMMONS USER NAME (credential, e.g., agency login): JOHNHOREL (14755774)

POSITION TITLE:Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| San Jose State University; San Jose CA | B.S.  | 5/1977 | Meteorology |
| University of Washington; Seattle WA | Ph.D. | 6/1982 | Atmospheric Sciences |
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**A. Personal Statement
I have been involved in innovations in teaching and training including Co-PI of summer NSF REU Programs and developer of courses for undergraduate and graduate students in data science and environmental information. My research is centered on the observation and analysis of weather, climate, and air pollution processes in mountainous regions. My current research activities include research and development related to MesoWest to provide access to environmental observations for operational, research, and educational applications. My research group is involved extensively with improving access, archival, and dissemination for operational weather prediction model output for diverse research and data science applications. I also am involved in research and software development related to fire weather.**

1. **Recently Completed Support.** ID:10060344. Horel (PI).7/1/2021-12/31/12022. Utah Division of Air Quality. *Impacts of the Great Salt Lake on Summer Ozone Concentrations Along the Wasatch Front*

Relevance to Current Proposal: Factors were evaluated that contribute to elevated ozone concentrations along the southern and eastern margins of the Great Salt Lake that serve as a source region for high ozone concentrations along the Wasatch Front.

1. **Current Support.** TS2020-144AB. Horel (PI). 4/1/2020-4/1/2024. Synoptic Data Public Data Corporation. *Support Services for the National Mesonet Program of the National Weather Service*

Relevance to Current Proposal: Continue development of tools to access and analyze environmental data.

1. **Current Support.** ID:2244272**.** Horel (Co-PI).National Science Foundation. *REALM- Research Experience in Alpine Meteorology*

Relevance to Current Proposal: Engage undergraduate students in full-time active research; (2) provide professional development opportunities for students and mentors; (3) motivate students towards STEM careers by constructing an engaging, inclusive, and supportive cohort experience that includes exposing them through site visits to employment opportunities in the weather, water, and climate enterprise; and (4) improve students' science literacy oral and written communication skills. Continue development of tools to access and analyze environmental data.

1. **Horel, J**., E. Crosman, A. Jacques, B. Blaylock, S. Arens, A. Long, J. Sohl, R. Martin, 2016: Summer ozone concentrations in the vicinity of the Great Salt Lake. *Atmospheric Science Letters*. 17, 480-486. doi: 10.1002/asl.680.

Relevance to Current Proposal: Research conducted in an earlier field study that is highly pertinent to health effect studies of summer pollution.

**B. Positions, Scientific Appointments, and Honors
Positions**

* Chair, Atmospheric Sciences, University of Utah 2018-2023
* Professor, Atmospheric Sciences, University of Utah 1996-current
* Director, NOAA Cooperative Institute for Regional Prediction, University of Utah 2002-2006
* Acting Director, Cooperative Institute for Regional Prediction, University of Utah 1996-1998
* Associate Professor, Meteorology, University of Utah 1990-1996
* Assistant Professor, Meteorology, University of Utah 1986-1990
* Assistant Research Professor, Scripps Institution of Oceanography 1982-1986

**Honors**

* Named Session Award, American Meteorological Society Comm. on Mountain Meteorology 2022
* American Meteorology Society Francis W. Reichelderfer Award 2016
	+ For development and leadership of the MesoWest observational network in support of operations, research, and education to improve understanding and forecasting of mountain meteorology
* Fellow of the American Meteorological Society 2002
* Outstanding Service Award, National Weather Service Western Region 2002
	+ For outstanding service to the weather support group for the 2002 Olympic Winter Games
* College of Mines and Earth Sciences Outstanding Teacher Award 1994

**C. Contributions to Science**

 **1. Accessing Environmental Observations for Diverse Applications. A major research focus over the past decades for my research group has been to collect, archive, and distribute environmental observations from tens of thousands of locations as part of the MesoWest program. Information accessible via MesoWest has been used by thousands for educational, research, and public safety applications.**

a. Shah, J., and 19 coauthors listed alphabetically including **J. Horel**, 2021: The Wasatch Environmental Observatory: A mountain to urban research network in the semi-arid Western US. *Hydrologic Processes.* 35, http://doi.org/10.1002/hyp.14352

b. Craft, K., **J. Horel**, 2019: Variations in surface albedo arising from flooding and dessication cycles on the Bonneville Salt Flats, Utah. *J. Appl. Meteor. Clim*., 58. 773-785. https://journals.ametsoc.org/doi/ full/10.1175/JAMC-D-18-0219.1

c. Jacques, A., **J. Horel**, E. T. Crosman, F. L. Vernon, 2017: Tracking Mesoscale Pressure Perturbations Using the USArray Transportable Array. *Mon. Wea. Rev.* 145, 3119-3142. *http://journals.ametsoc.org/doi/pdf/10.1175/MWR-D-16-0450.1*

d. **Horel, J**., M. Splitt, L. Dunn, J. Pechmann, B. White, C. Ciliberti, S. Lazarus, J. Slemmer, D. Zaff, J. Burks, 2002: MesoWest: Cooperative Mesonets in the Western United States. *Bull. Amer. Meteor. Soc*., 83, 211-226. http://dx.doi.org/10.1175/1520-0477(2002)083<0211:MCMITW>2.3.CO;2

**2. Monitoring Air Quality in Urban and Rural Environments. Collaboration with researchers in the Department of Atmospheric Sciences involves deploying air quality sensors at fixed sites, on light rail cars, electric buses, and a traffic helicopter in the Salt Lake Valley. These additional observations help to provide a hyperlocal network to monitor particulates and ozone in an urban basin that is unique in the United States. Modeling emissions and transport of pollutants in urban and rural environments has also been a critical area of research in my group.**

**a.** Hallar, G. and coauthors (Horel J, author 8 of 26), 2021: Coupled Air Quality and Boundary-Layer Meteorology in Western U.S. Basins during Winter: Design and Rationale for a Comprehensive Study. *Bull. Amer. Meteor. Soc.* 102, E2012–E2033,https://doi.org/10.1175/BAMS-D-20-0017.1

b. Foster, CS, Crosman, ET, **Horel, J**, Lyman, S, Fasoli, B, Bares, R and Lin, JC. 2019. Quantifying methane emissions in the Uintah Basin during wintertime stagnation episodes. *Elem Sci Anth*, 7: 24. DOI: https://doi.org/10.1525/ elementa.362

c. Lin, J., L. Mitchell, E. Crosman, D. Mendoza, M. Buchert, R. Bares, B. Fasoli, D. Bowling, D. Pataki, D. Catharine, C. Strong, K. Gurney, R. Patarasuk, M. Baasandorj, A. Jacques, S. Hoch, **J. Horel**, J. Ehleringer, 2018: CO2 and carbon emissions from cities: linkages to air quality, socioeconomic activity and stakeholders in the Salt Lake City urban area. *Bull Amer. Meteor. Soc*. 2325-2339.
https://doi.org/10.1175/BAMS-D-17-0037.1

d. Mitchell, L., E. Crosman; A. Jacques; B. Fasoli, L. Leclair-Marzolf, **J. Horel**, D. Bowling, J. Ehleringer, J. Lin, 2018: Monitoring of greenhouse gases and pollutants across an urban area using a light-rail public transit platform. *Atmospheric Environment. 187,* 9-23.https://doi.org/10.1016 /j.atmosenv.2018.05.044

**3. Developing Improved Methods to Access and Evaluate Operational Weather Prediction Model Output for Diverse Applications. Improved methods to access, archive, and disseminate output from operational weather prediction models have been developed. These approaches have made it possible for hundreds of researchers to access Tbytes of model data from cloud and university compute resources. New techniques to evaluate the skill of operational weather prediction models has also b**

**a. Gowan, T. A., J. Horel, A. Jacques, 2022: Using cloud computing to analyze model output archived in ZARR format. Journal of Atmospheric and Oceanic Technology. https://doi.org/10.1175/JTECH-D-21-0106.1**

b. Blaylock, B., **J. Horel,** 2020: Comparison of Lightning Forecasts from the High-Resolution Rapid Refresh Model to Geostationary Lightning Mapper Observations. *Wea. Forecasting.* 35, 401-416. https://journals.ametsoc.org/doi/abs/10.1175/WAF-D-19-0141.1

c. Blaylock, B., **J. Horel**, C. Galli, 2018: High-Resolution Rapid Refresh Model Data Analytics Derived on the Open Science Grid to Assist Wildfire Weather Assessment. *Journal of Atmospheric and Oceanic Technology,* 35*,* 2213-2227. https://journals.ametsoc.org/doi/abs/10.1175/JTECH-D-18-0073.1

d. Blaylock, B., **J. Horel**, S. Liston, 2017: Cloud archiving and data mining of High Resolution Rapid Refresh Model Output. *Computers and Geosciences*, 109, 43-50. doi.org/10.1016/j.cageo.2017.08.005

**4. Research and Software Development Related to Wildfire Applications. Research has been undertaken and software has been developed for operational wildfire management personnel across the contiguous United States and Alaska. The operational products are online: Great Lakes Fire and Fuels System and Alaska Fore and Fuels System**

a. **Horel, J.**, R. Ziel, C. Galli, J. Pechmann, X. Dong, 2014: An evaluation of fire danger and behavior indices in the Great Lakes region calculated from station and gridded weather information. *International Journal of Wildland Fire*. 23, 202–214. http://10.1071/WF12186

b. **Horel, J.**., and X. Dong 2010: An evaluation of the distribution of Remote Automated Weather Stations (RAWS). Journal of Appl. Meteor. and Clim., 49, 1563-1578 59.

c. Lammers, M., and **J. Horel**, 2014: Verification of National Weather Service spot forecasts using surface observations. *J. Operational Meteor*, 2, 246–264.http://dx.doi.org/10.15191/nwajom.2014.0220.

d. Myrick, D., and J. Horel, 2008: Sensitivity of surface analyses over the western United States to RAWS observations. *Wea. Forecasting,* 23, 145-158. http://dx.doi.org/10.1175/2007WAF2006074.1