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 Baylor University
 Binghamton University, State University of New York
 Boise State University
 Boston College
 Boston University
 Brown University
 California Institute of Technology
 California State Polytechnic University, Pomona
 California State University, East Bay
 Carnegie Institution of Washington
 Central Washington University
 Colorado School of Mines
 Colorado State University
 Columbia University
 Cornell University
 Duke University
 Florida International University
 Georgia Institute of Technology
 Harvard University
 Idaho State University
 IGPP/Lawrence Livermore National Laboratory
 IGPP/Los Alamos National Laboratory
 Indiana University–Purdue University Fort Wayne
 Indiana University
 James Madison University
 Kansas State University
 Lamar University
 Lawrence Berkeley National Laboratory
 Lehigh University
 Louisiana State University
 Macalester College
 Massachusetts Institute of Technology
 Miami University of Ohio
 Michigan State University
 Michigan Technological University
 Missouri University of Science and Technology
 Montana Tech/University of Montana
 New Mexico State University
 New Mexico Tech
 North Carolina State University
 Northern Arizona University
 Northern Illinois University
 Northwestern University
 Oklahoma State University
 Oregon State University
 Pennsylvania State University
 Princeton University
 Purdue University
 Rensselaer Polytechnic Institute
 Rice University
 Rutgers University
 Saint Louis University
 San Diego State University
 San Jose State University
 Southern Methodist University
 Stanford University
 Stony Brook University
 Syracuse University
 Texas A&M University
 Texas Tech University
 Virginia Tech
 Washington University in St. Louis
 West Virginia University
 Western Washington University
 Woods Hole Oceanographic Institution
 Wright State University
 Yale University
 The University of Alabama
 The University of Arizona
 The University of Kansas
 The University of Oklahoma/Energy Center
 The University of Tennessee, Knoxville
 The University of Texas at Arlington
 The University of Texas at Austin
 The University of Texas at Dallas
 The University of Texas at El Paso
 The University of Tulsa
 The University of Utah
 University of Alaska Fairbanks
 University of Arkansas at Little Rock
 University of California, Berkeley
 University of California, Davis
 University of California, Los Angeles
 University of California, Riverside
 University of California, San Diego
 University of California, Santa Barbara
 University of California, Santa Cruz
 University of Colorado Boulder
 University of Connecticut
 University of Delaware
 University of Florida
 University of Georgia
 University of Hawaii at Manoa
 University of Houston
 University of Illinois, Urbana Champaign
 University of Kentucky
 University of Maryland, College Park
 University of Massachusetts Amherst
 University of Memphis
 University of Miami
 University of Michigan
 University of Minnesota
 University of Missouri, Columbia
 University of Nevada, Las Vegas
 University of Nevada, Reno
 University of New Mexico
 University of New Orleans
 University of North Carolina at Chapel Hill
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 University of Pittsburgh
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 University of Rochester
 University of South Carolina
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 University of Southern California
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 University of Wisconsin–Milwaukee
 University of Wisconsin Oshkosh
 University of Wyoming



IMPACT of WIND GENERATORS on the GLOBAL SEISMOGRAPHIC NETWORK (GSN) November 2016

Recommendation:

IRIS recommends that a buffer of at least 15 km be kept between existing Global Seismographic Network (GSN) stations and wind-turbine emplacements to ensure acceptable recording conditions for seismic sensors.

Supporting Information:

The GSN is the premier scientific infrastructure for recording and understanding ground motion from seismic events worldwide. All GSN data are freely and openly available. Society benefits from the GSN in several important ways in addition to the network's primary purpose of basic scientific research into the properties and processes of Earth's interior. GSN data are used to locate and characterize earthquakes and other seismic events worldwide, to refine hazard assessments and update building requirements in seismically active regions, to warn communities of impending tsunami-wave arrivals, and to detect illicit underground detonations of nuclear devices. The GSN represents an aggregate infrastructure investment of over \$200M.

The basic data for seismological research includes extremely small ground vibrations from moderate to large seismic events occurring anywhere on Earth. Accordingly, a major criterion for selecting the location of GSN stations is the distance from vibrational noise sources, either anthropogenic or natural. Sites are generally placed far from inhabited areas where traffic or machinery could drown out the faint signals that GSN sensors are designed to detect and record.

Installation of wind turbines near GSN stations diminishes the value of data recorded at these sites. Research clearly indicates that the ground vibrations created by wind turbines through motion of the rotor or swaying of the support tower can be detected by seismic instruments many kilometers away. These vibrations have a range of frequencies that overlaps with signals important for understanding earthquake behavior and hazardous ground shaking. There is no fixed distance at which ground motion from wind turbines fully disappears. However, the ground noise generated by wind farms typically degrade the earthquake signals to distances of at least 15 km. An uncontrolled installation of wind turbines can therefore disturb the operation of the GSN sensors and adversely affect observational conditions for earthquake monitoring worldwide.

Founded in 1984 with support from the US National Science Foundation, IRIS is a consortium of over 100 US universities dedicated to the operation of science facilities for the acquisition, management, and distribution of seismological data. IRIS programs contribute to scholarly research, education, earthquake hazard mitigation, and verification of the Comprehensive Nuclear-Test-Ban Treaty.