



GreenGov Presidential Awards
2015 Nominations

Deadline: May 22, 2015

Nomination Receipt

**The following information has been successfully submitted.
Please print this page for future reference.**

Nomination ID: 25

Date Submitted

05/19/2015

Nomination Information

Agency: Department of Energy

Award Category: Climate Champion Award

Title of Nomination: Climate Change Realities at LANL

Project Team/Program/Facility: US DOE, Los Alamos National Laboratory

Project Location: Los Alamos, New Mexico

Nomination Type: Team

Team/Individual Name: LANL, U.S. DOE, NNSA

Individual Nomination Information

Individual Name:

Individual Title:

Team Nomination Information

Member 1 Name: Dennis Hjeresen

Member 1 Employment Type: Non-Federal

Member 2 Name: Michael Sweitzer

Member 2 Employment Type: Federal

Member 3 Name: Cassandra Begay

Member 3 Employment Type: Federal

Member 4 Name: Josh Silverman
Member 4 Employment Type: Federal

Member 5 Name: Eric Bradley
Member 5 Employment Type: Federal

Member 6 Name:
Member 6 Employment Type:

Project Description

Over the past two decades a cascade of climate-related events have seriously impacted Department of Energy (DOE)/National Nuclear Security Administration (NNSA) operations at Los Alamos National Laboratory (LANL). The site has taken a proactive approach to identify strategies to mitigate the long- and short-term effects of these events. In 2010 the DOE/NNSA and LANL initiated a Long-term Strategy for Environmental Stewardship and Sustainability (LTSESS). The LTSESS 50-year planning horizon refocused thinking about climate impacts on current and future operations and infrastructure. The LTSESS sets long term institutional goals, tracks implementation and helps raise institutional awareness of climate and sustainability issues. Goals are aligned with the themes of the LTSESS: *Clean the Past, Control the Present, Create a Sustainable Future*.

Although there is substantial environmental and cost risk associated with climate change and variability, the DOE/NNSA, LANL and surrounding communities have gained significant experience in developing and implementing mitigation and adaptation strategies. These strategies are now being shared across the Federal community.

Background: While the Pajarito Plateau where Los Alamos is sited is no stranger to the impacts of climatic changes, the most recent cycle of events is illustrative of the cumulative impacts of climate variability. Beginning in the early 1990's, persistent drought-related deterioration of forest health opened a path for a widespread infestation of pine bark beetles. An outbreak-level infestation occurred in the 2002-2004 timeframe killing millions of trees over 2.1 million acres of piñon-juniper forest and 1.3 million acres of Ponderosa pine forest in Arizona and New Mexico. The combination of extensive understory growth in the 1980's, the lack of natural burns, dead combustible trees, higher temperatures and dry winds contributed directly to the size and severity of megafires on the Pajarito Plateau.

The Cerro Grande fire in May 2000 and the Los Conchas fire in July 2011 burned onto Laboratory property, destroyed hundreds of resident's homes and required the shutdown of the Lab and the evacuation of the town. DOE/NNSA and LANL had made efforts prior to the Cerro Grande fire to mitigate risks, by thinning forests near critical facilities and other related measures. But the fire served as a wakeup call for how costly and extreme the risks could be. Given the fuel availability, temperature, precipitation, wind, humidity, lightning strike locations, and the increase in population density, New Mexico could expect to have a greater number of more intense wildfires in the future unless mitigation strategies were implemented. A key outcome of the nominated effort is the development of such

integrated strategies including a Wildfire Management Plan integrated across Federal agencies and with local communities.

The megafires altered the landscape and created ongoing surface water management problems, as denuded slopes have been unable to adequately retain storm runoff. Strong, unpredictable rainstorms have further exacerbated the runoff problem. In 2012 and 2013, the Laboratory experienced 100, 200 and 1000-year severity storm events within 18 months. Collectively, millions of dollars in flooding damage have been incurred with culverts, roads, retention structures, monitoring stations, and artificial wetlands destroyed. Flood runoff further threatens work to stabilize contaminants in canyon bottom sediments.

The wildfires and flooding also changed environmental restoration priorities for DOE/NNSA and LANL. Faced with wildfire danger, the DOE, Laboratory and the New Mexico Environment Department signed a Framework Agreement to remove 3706 cubic meters of above ground transuranic (TRU) waste by 2015 even though this could delay other cleanup activities under the NMED Order on Consent.

The ongoing wildfire threat has also changed routine operating procedures at LANL. Increasing “Red Flag” days with high winds and low humidity force the cessation of many outdoor operations.

Collectively, these risks and consequences are being addressed through the LTSESS strategic approach to climate impacts, infrastructure, operations and facility planning. A key element of this new strategic approach has been to document impacts and costs of climate related events and to demonstrate the relationship between such events. Specifically, damages from the Cerro Grande fire to LANL infrastructure have cost \$331,180,631 to date. Losses from the Los Conchas fire total \$15,708,141 to date. Though the Los Conchas fire was much larger than the Cerro Grande, the difference in cost reflects extensive mitigations and changes in forest management between 2000- and 2011. Similarly, costs to the Environmental Restoration project from the September 2013 rain event total over \$13 million and continue to rise as repairs continue on roads and infrastructure in canyon bottoms. Indeed, much of the canyon legacy contaminant remediation work must be approached differently because of this threat.

Project Results and Achievements

The DOE/NNSA has invested considerable time, effort and money at LANL to develop the LTSESS and develop approaches to prevent or adapt to the impacts of climate change and variability. Key accomplishments include:

- Creating a Comprehensive Emergency Planning Hazard Assessment program to provide a technical basis for protective actions. This effort employs extensive scenario planning and beyond design basis analysis.
- Working with other Federal agencies, State Tribal, and local governments to improve communication during events and restoration activities. This includes the establishment of a joint multi-agency emergency response center for coordinated

operations.

- Critical areas, called 'fuel treatment plots,' have been identified and the fuel level is being managed by the Wildland Fire Mitigation team to pre-1900 levels of 50 to 150 trees per acre in order to minimize potential fire risks. Currently the forests tend to have 400 and 1,300 trees per acre; this tenfold increase in dead fuel load has led to the more intense crown fires rather than the historical low intensity surface fires that traditionally burned back the grassy understory and thinned out the new trees.

- Damaged areas have been re-seeded with groundcover and planted with trees to give the environment a fighting chance when the next event occurs.

- Fire road and firebreak inspection programs have been implemented to foster better coordination/communication between Federal, State and local agencies present in the region.

- To increase confidence in the surrounding communities in the Rio Grande river basin additional water quality monitors have been installed and strategies have been implemented to minimize contaminant runoff in the case of flash floods. Retention basins and grade-control structures have been created to reduce transport of contaminated sediment.

- LANL proactively partnered with the Army Corps of Engineers to construct a 70-foot flood control and retention structure in Pajarito Canyon.

- As a response to potential flooding, surface water management techniques shifted to low impact controls and away from more permanent concrete structures. This change was made in close cooperation with external stakeholders and water activist groups.

- Burned areas and slopes that could potentially slow down a flash flood have been seeded and willow trees have been planted in a wetland.

- A Climate Change Team Leader position has been created to help integrate prevention and mitigation activities.

- LANL created a Long-range Plan Managers Working Group to coordinate programs in Site Sustainability, the Site-wide Environmental Impact Statement, the Long Range Infrastructure Development Plan, Waste Management and Site Footprint Reduction.

- The LTSESS has developed, implemented and monitored the progress of institutional goals that contribute to the overall sustainability of the site. These include:

- o Workplace Stewardship and Legacy Cleanout
- o Enduring Waste Management Plan
- o Green Infrastructure and Maintenance
- o Integrated Land Management Plan
- o Energy and Water Conservation

Going forward the Laboratory will extend its continuum of activities along response levels: prevention, mitigation, and adaptation. Climate impacts represent a significant challenge, but by integrating mitigation strategies into facility operations and long-term planning the site can ensure it is prepared to weather the storm.

In addition to working closely with other Federal agencies, State Government, multiple Tribal Nations and local governments, DOE, NNSA and LANL staff have been actively sharing the lessons learned from the past 15 years of climate impact response and planning. Key activities include:

- Emergency response planning approaches have been widely presented to State, Tribal and local governments and Community Leader organizations in Northern New Mexico.
- LANL and DOE/NNSA staff actively shares processes and results through the Energy Facility Contractors Group (EFCOG), a voluntary organization of nearly 100 companies supporting Federal government operations. The Environmental Subgroup of the Environment, Safety and Health Working Group has been active in disseminating sustainability and climate impact planning approaches through the EFCOG Best Practices program (see <http://www.efcog.org/bp/p/125.htm> as an example).
- DOE/NNSA and LANL staff have presented the LANL approach at national workshops and teleconferences:
 - o DOE NNSA Annual Site Sustainability Summit 9-18-14 with national teleconference connection.
 - o EFCOG Spring Meeting, 3-18-15 with national teleconference connection and group discussion.
 - o DOE Sustainability Assistance Network National Webinar, 5-21-15 with 100-person invitation list.
 - o Presentation materials from these talks have been posted to a variety of web-sites to increase dissemination.

DOE/NNSA and contractor staff have prepared and submitted for peer-reviewed publication a case study of the LANL site approach: *Climate Change and the Los Alamos National Laboratory: The Adaptation Challenge*. This paper has also been distributed extensively through EFCOG and DOE/NNSA Sustainability group channels.