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A Resilient Nevada: Reducing Economic Losses from Earthquakes, Wildfires and Extreme Weather

The Nevada Seismological Laboratory at UNR can assist Nevada towards greater economic resilience in response to devastating natural hazards through state-of-the-art 'early warning' monitoring and aggressive public outreach programs. The goal is to ensure the Silver State not only survives, but also thrives after the next devastating event.

The Nevada Seismological Laboratory (NSL) at UNR has recently embarked on a bold initiative to create a high-speed wireless statewide microwave network that provides real-time digital (IP) connectivity for monitoring earthquakes and wildfires. The system assists state and federal first responders and the public in response to catastrophic events. The program has recently developed 'early warning' wildfire technologies that have directly impacted fire response. The system has assisted agencies in 'knocking down' wildfires at their earliest stages—with significant fire suppression savings. For example, our nascent 'fire camera' network was involved with providing discovery and/or early intelligence on 25+ wildfires in the 2015 fire season, highlighting a cutting-edge system that has 'paid for itself' in the first year of operation... NSL is also poised to implement Earthquake Early Warning (EEW) strategies, where emergency personnel and public officials receive seconds to 10s of warning prior to damaging ground shaking. An example of an important use of EEW would be the approximate 45-60 second warning for the greater Las Vegas area due to a major rupture of the Death Valley fault zone (a fault capable of a Magnitude 7.5 event). This very realistic earthquake rupture scenario will have a significant effect on the greater Las Vegas region. Since the evolving NSL statewide microwave is a 'privately managed' system, it is not susceptible to failures that occur on public cellular, and in some cases, fiber networks due to large traffic upswings (overloading) during catastrophic events (wildfire, earthquakes and extreme weather)—our private communications system operates '*off the public grid*'.

Beyond early warning strategies, Nevada needs to quickly embrace meaningful economic resiliency strategies for Nevada's the most threatening natural hazard: large earthquakes. Our prolonged 60+ year 'drought' of large M6.5+ earthquakes is likely to end sooner rather than later… for reference, there were 7 M6.5+ earthquakes in Nevada between 1915-1954, and none since. A first step towards life safety and economic resilience has been the Great Nevada ShakeOut, which is our annual statewide 'drop, cover and hold on' drill that for 2015, its 6th year, had over 630,000+ participants. ShakeOut is just a small piece of statewide efforts to awareness of resilience issues. Greater participation in the overall earthquake insurance pool by businesses and homeowners is another excellent step. Programs such as 'Fix the Bricks' in Salt Lake City that incentivizes homeowners to improve unreinforced masonry (URM) building response to damaging events is a critical program to ensure that the majority of citizens can 'get to work' the day following an earthquake. San Francisco secures 'private equity' for low cost loans to address its 'soft story' building exposure. Many cities in west have hired Resiliency Officers to understand critical exposures to hazards for 'quick recovery', and to formulate innovative ways to address recognized problems (www.100resilientcities.org). As the resiliency culture gains momentum, the business community and citizens of Nevada will expect this level of preparation. NSL is in a unique position, as a statewide program and with close ties to the Emergency Management community, to assist the state in these efforts. There are also co-opportunities with the Nevada Bureau of Mines and Geology in implementing effective resiliency; new strategies should seriously be considered as Nevada attracts major businesses and retools its economy.

The requested uptick in funding for NSL will provide greater resiliency for natural hazards monitoring (i.e., statewide earthquake monitoring). Unfortunately NSL staff is dependent on external grants and contracts, several not specifically related to earthquake response; this is not the case for other western states with a recognized high seismic hazard. Through securing support for critical administrative faculty, and hiring an equivalent number of employees through soft money support, NSL will stabilize operations for reliable monitoring of earthquakes, fire and extreme weather events. The proposed state investment ($1M/year) will place us on par with states with similar risks (e.g., Utah,

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Washington, California). Outreach efforts, also prominent to other western state's resiliency programs, are key to the business resiliency effort in Nevada. The investment will be recouped in Nevada on an annual basis from fire suppression cost savings. The $1M/year proposed supplement is half of the total amount of external federal, state and private grants annually secured by NSL for earthquake monitoring and outreach programs.

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