

*Exceptional service in the national interest*



Photos placed in horizontal position  
with even amount of white space  
between photos and header

# Saguaro Cactus Vibration Measurements, NMSBA Project Ben Pacini, Org 1522 December 17, 2015

# Saguaro Cactus Project

## ■ Background

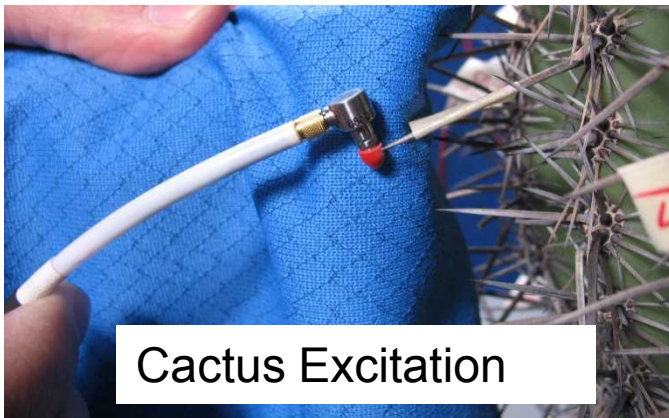
- Hardwood trees produce acoustic emissions due to cavitation of the xylem as water is withdrawn during periods of drought. These emissions provide insights into the internal fluid transport behavior and degree to which cavitation can proceed before inevitable tree mortality.

## ■ Purpose

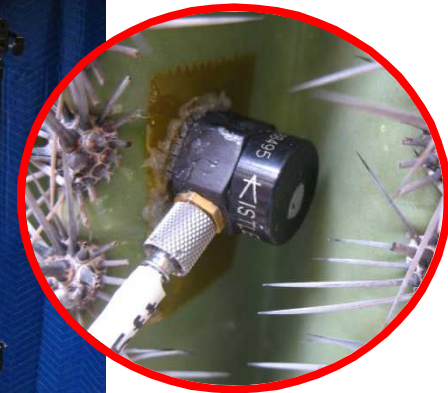
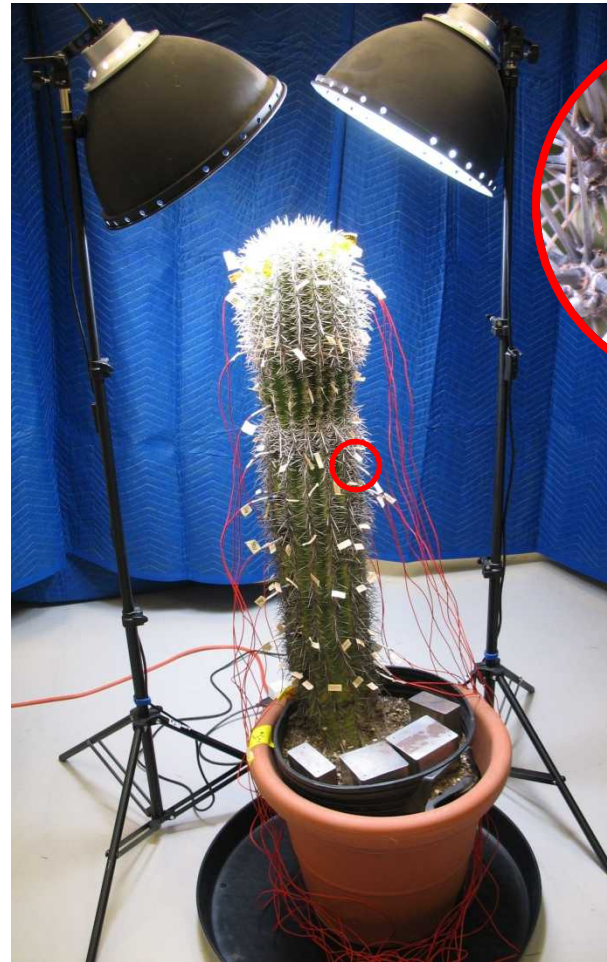
- This NMSBA project aims to determine if similar acoustic emissions occur in Saguaro Cacti
  - This information can be used to understand the impact of climate change on the Saguaro Cacti which are very sensitive to environmental perturbations
- SNL's task was to measure data which were then delivered to the small business (Foxtrotter Geophysical) for analysis

# Saguaro Cactus Project

- Instrumented juvenile Saguaro with 24 accelerometers
- Testing included three phases: excitation of dehydrated cactus, continuous monitoring for acoustic emissions for 2 days during hydration, and a second excitation test of the hydrated cactus.
  - Excitation tests allow for determining source location(s) of acoustic emission(s)



Cactus Excitation



Fun fact:  
super glue  
does not  
stick to  
cactus skin