How to Utilize Human Resources in Large-Scale Research and Monitoring
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Background
- Most research projects require large amounts of data for their results to be as accurate as possible. This requirement only increases when scale and scope do as well
- Because data collection is so labor intensive, being able to involve volunteer citizen scientists can greatly reduce the amount of time it takes to collect and process data
- However, understanding how to best utilize volunteer resources can be challenging

Question
- How can large-scale research and monitoring projects better utilize human resources such as citizen scientists to expedite their processes?

Internship
- Worked in the Olympic National Forest carrying out tests of acoustic monitoring devices (AMDs)
- Used data gathered from acoustic monitoring devices within a software package in RStudio to determine its accuracy in detecting bird calls
- Worked alongside interns at the Olympic Natural Resources Center to conduct various surveying techniques and deciding the best ways for citizen scientists to carry them out in the future

Methods
- Developed standardized and field-testing procedures for multiple types of acoustic monitoring devices
- Used RStudio to test a spectrogram detection program for large-scale viability
- Determined effective strategies for in-person surveying of forest land and ecosystems
- Developed an informational packet for potential citizen scientists to become familiarized with the species they will be working with

Results
- Work can easily be carried out by citizen scientists in 2 ways:
  - Land Surveys can be conducted effectively by 2 groups of 4-5 people
  - Equipment set up and operations
  - Pre-determined coordinates sent to volunteers along with the acoustic monitoring device
  - Recording schedule and settings are pre-programmed before the devices are sent out

Data Processing
- RStudio showed potential, but did not yield consistent enough results for large-scale use
- As of now, data must be processed by humans to yield accurate results

Significance
- Utilizing citizen scientists to perform tasks such as setting up acoustic monitoring devices and performing site surveys has the potential to save time on the order of hundreds of human hours of work when surveying large areas of land
- Finding and showing success with these methods could lead to wider-spread inclusion of citizen scientists and a larger percent of the population exposed to science

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