

**DEVELOPMENT OF AN  
AUTOMATED SYSTEM FOR  
ACOUSTIC IDENTIFICATION OF  
BATS**

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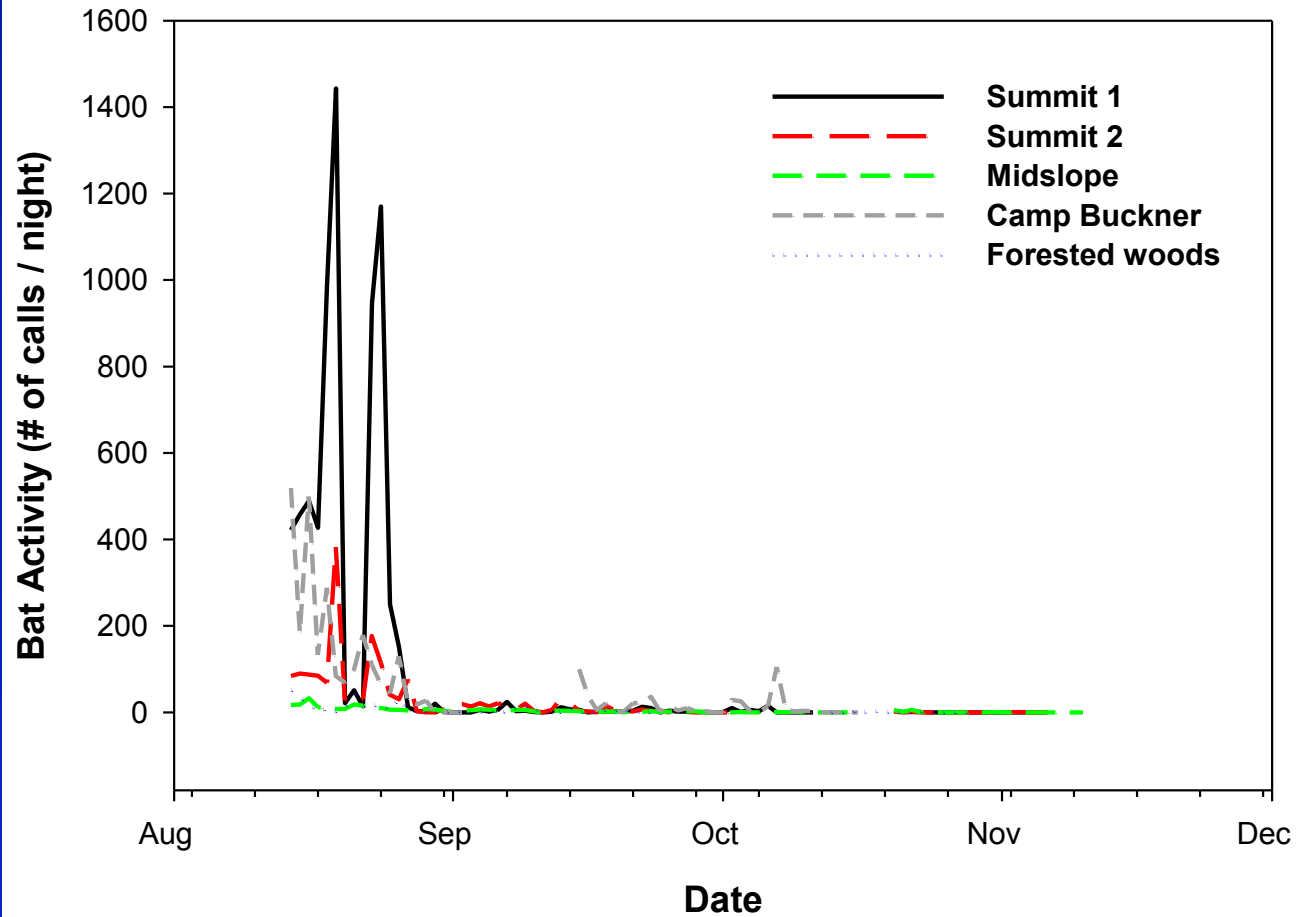
US Army Engineer Research and  
Development Center

# Acoustic sampling

- Allows extensive sampling with little human input
- Minimizes the impacts of temporal variation on the results
- Can sample areas that cannot be sampled using other techniques

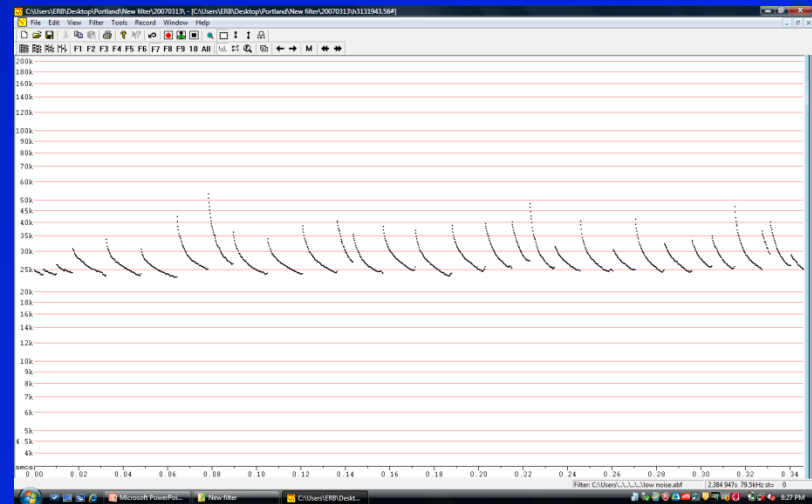


# Bat Activity



# Qualitative ID

- Accurate with extensive experience
- Variable accuracy rates
- Can analyze ~ 400 calls per hour



# Filters

- Easy to set up and run
- Fast analysis
- Can be customized to select specific call types
- Either very specific (selects a small set of calls from a species) or general (allows multiple species)

# Pre-automated quantitative ID

- Utilizes DFA
- Allows for ID with known accuracy rates
- Requires user to walk data through numerous steps in the process
- Analysis is limited

# Automated program overview

- What the new program isn't
- What the new program is
- Specifics

# What it's not

- More net filter
  - Aka: Britzke filter, MYSO filter
    - The most misused filter in Analook history
- Program of the summer of 2011
  - This program relied on Analook for cleaning and parameter extraction



# What the program is

- Still requires CFCRead to download data
  - Can actually use full spectrum data after some manipulation
- Data must be in consistent format and structure
- Conducts analysis of data from reading in directories to producing excel output

# Data organization needs

- No limit to the number of folders
- Need data in night folders
  - must be in yyymmdd named folder
- Need to have to levels above this night directory
- Example
  - Bats2012
    - Project 1
      - Site 1
        - » 20111119

# Options

- GPS data
  - For transects GPS files in night folder
  - For stationary data have a excel file
- Sunset/sunrise
  - Calculates activity of individual files

# Specifics

- Involves customized filtering
  - Automatically varies with noise levels of files
  - Removes noise
  - Identifies broken pulses
  - Allows for inclusion of COTO and CORA
- Extract parameters
  - ~ 20 parameters
  - Includes some sequence level parameters

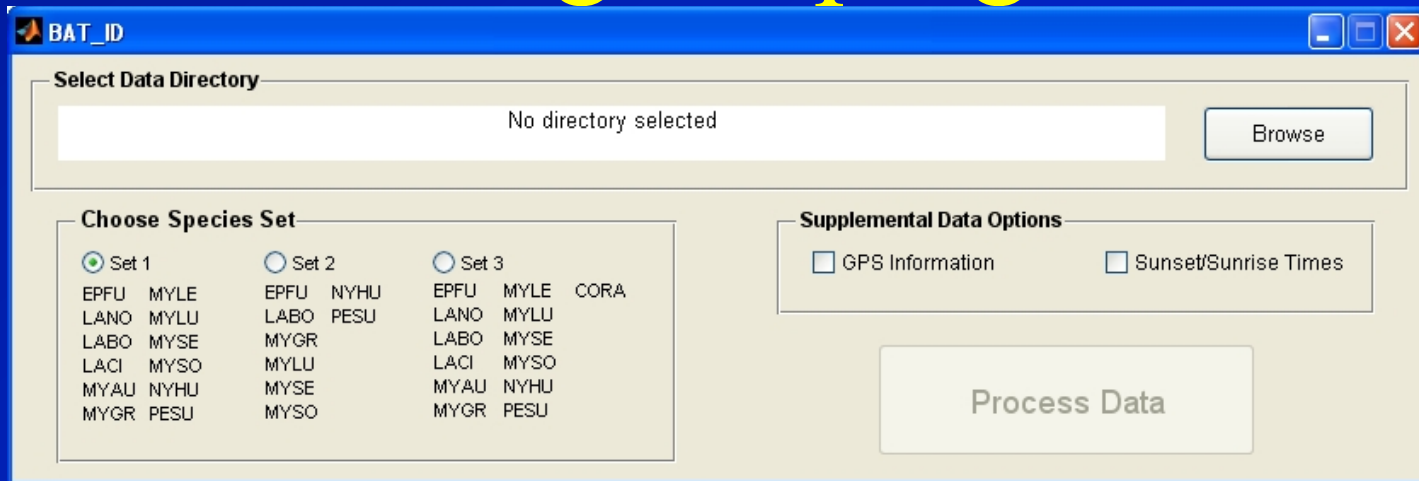
# Identification

- High/low frequency group for all pulses
- For high quality pulses does species identification
  - Use if/then statements for certain call types
  - DFA
- Allows identification as unknown

# Excel output of results

- File level summary
  - Data from each individual file analyzed
- Night/site level summary
  - Summary of all data from files from the same night and site combination
- Species presence summary
  - Species presence determinations based on maximum likelihood estimates

# Running the program



- Step 1: Browse to locate the main bat file
- Step 2: Chose the species set
- Step 3: Check the boxes for the supplemental data options as appropriate
- Step 4: Click Process data

# Alternative data input

- Since call library is time consuming to collect, an option was included to analyze from other data sources
- SCAN' R program allows extraction of parameters for inclusion in the automated program