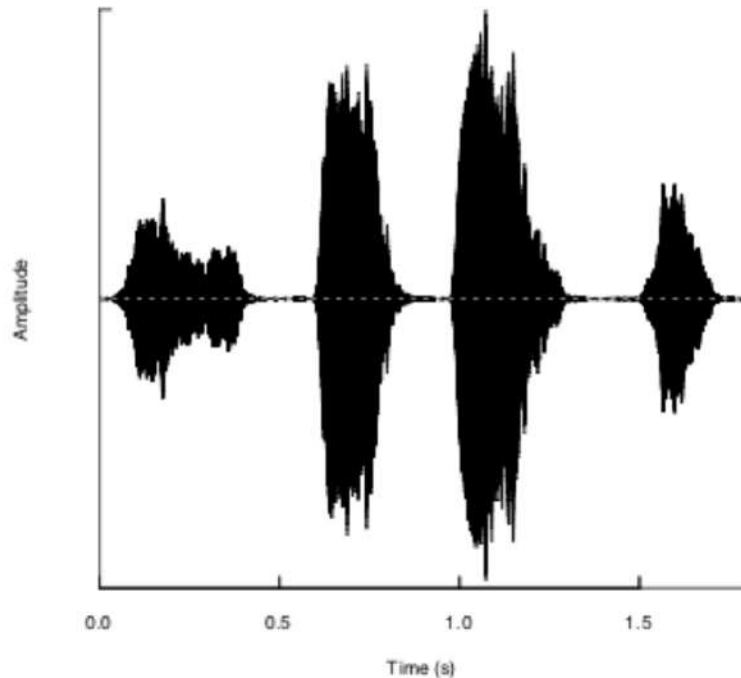# Using Seewave in R – for wav display and manipulation

- Variety of functions for displaying, manipulating and analyzing sound files

Seewave - oscillogram

Simple oscillogram

`oscillo(tico,f=22050)`

Multi-frame oscillogram

`oscillo(tico,f=22050,k=2,j=2)`

Oscillogram and enveloppe

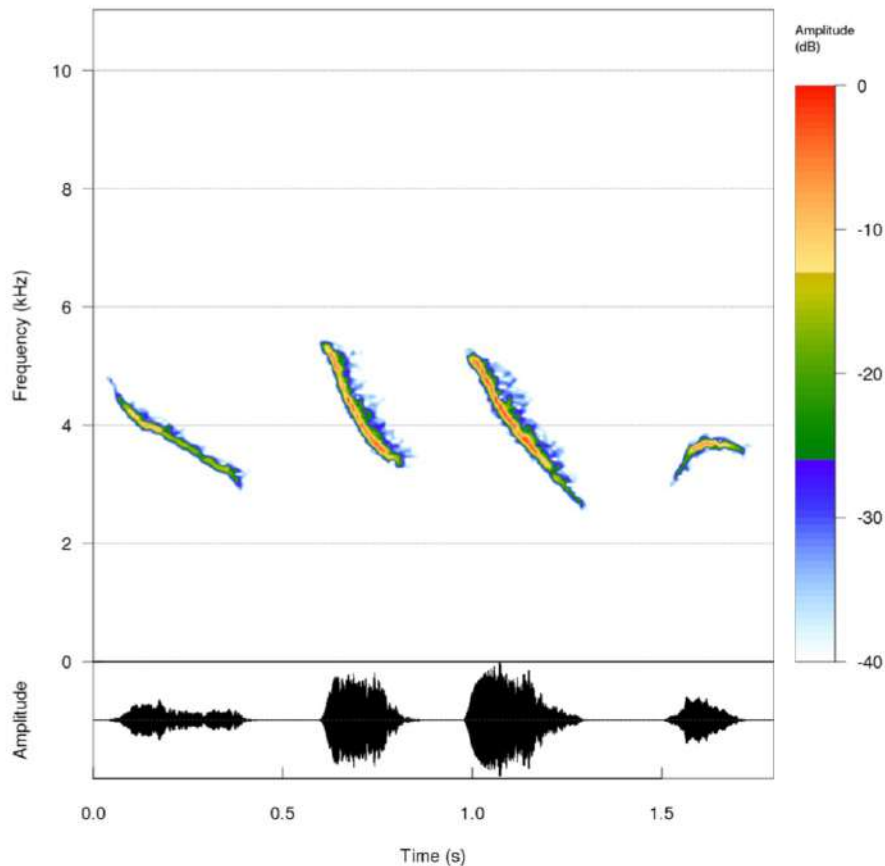`oscillo(tico,f=22050)`
`par(new=TRUE)`
`env(tico,f=22050,msmooth=c(20,0),colwave=2)`

# Seewave - spectrogram

with oscillogram plot

- Short-term Fourier Transform (STFT)
- several analysis windows (Hamming, Hanning, . . .)
- parameters : window length, window overlap, zero-padding, amplitude clipping level
- with/without oscillogram
- full color modifications

data(tico)
spectro(tico,f=22050, ovlp=50,zp=16,

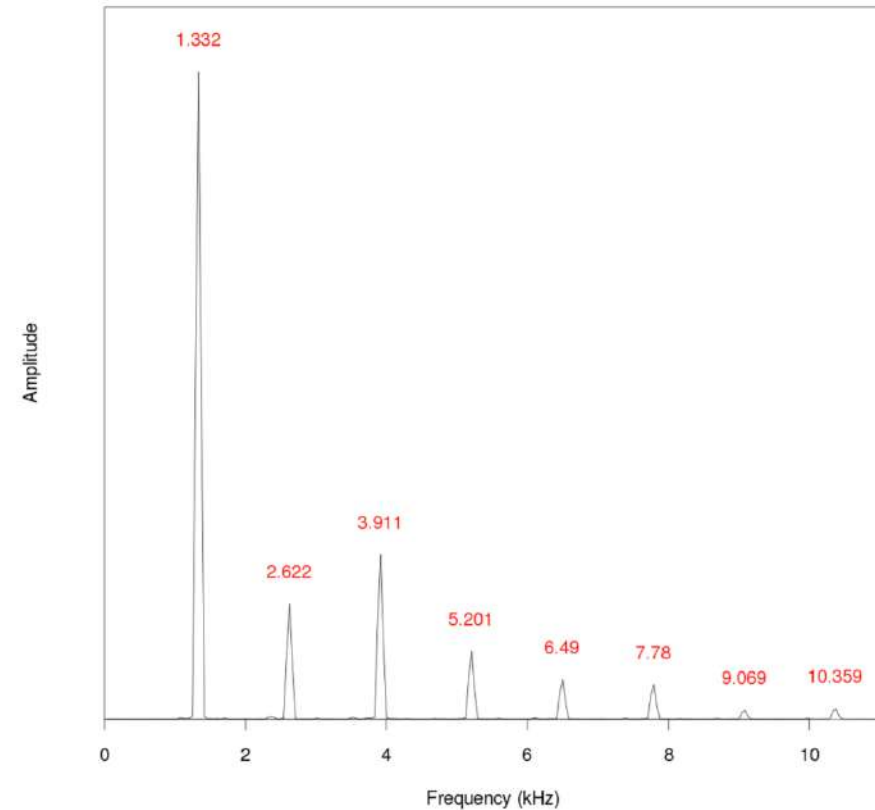palette=temp.colors, collevels=seq(-40,0,0.5), osc=TRUE)

Seewave – power spectrum

discrete and dB

automatic peak detection
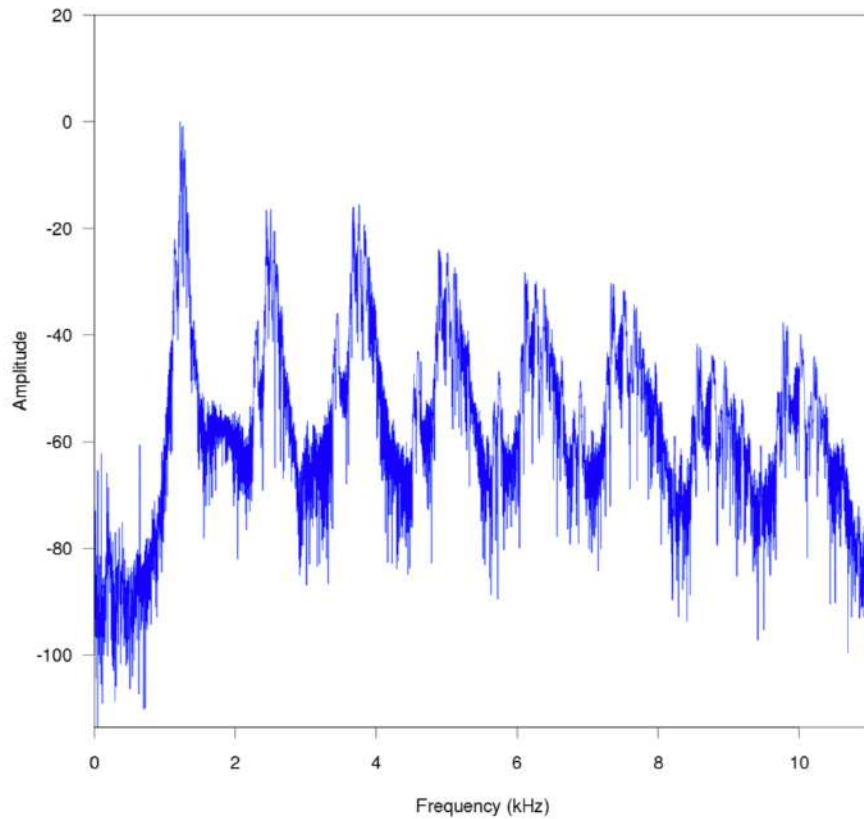
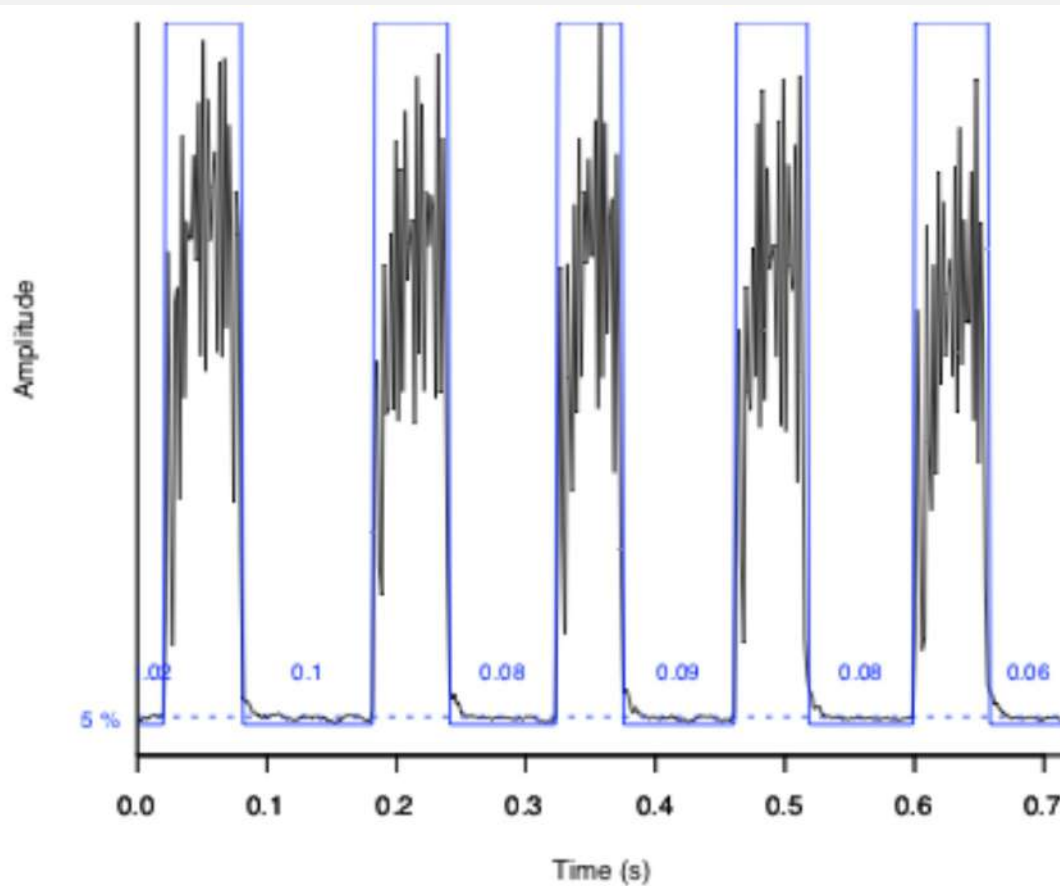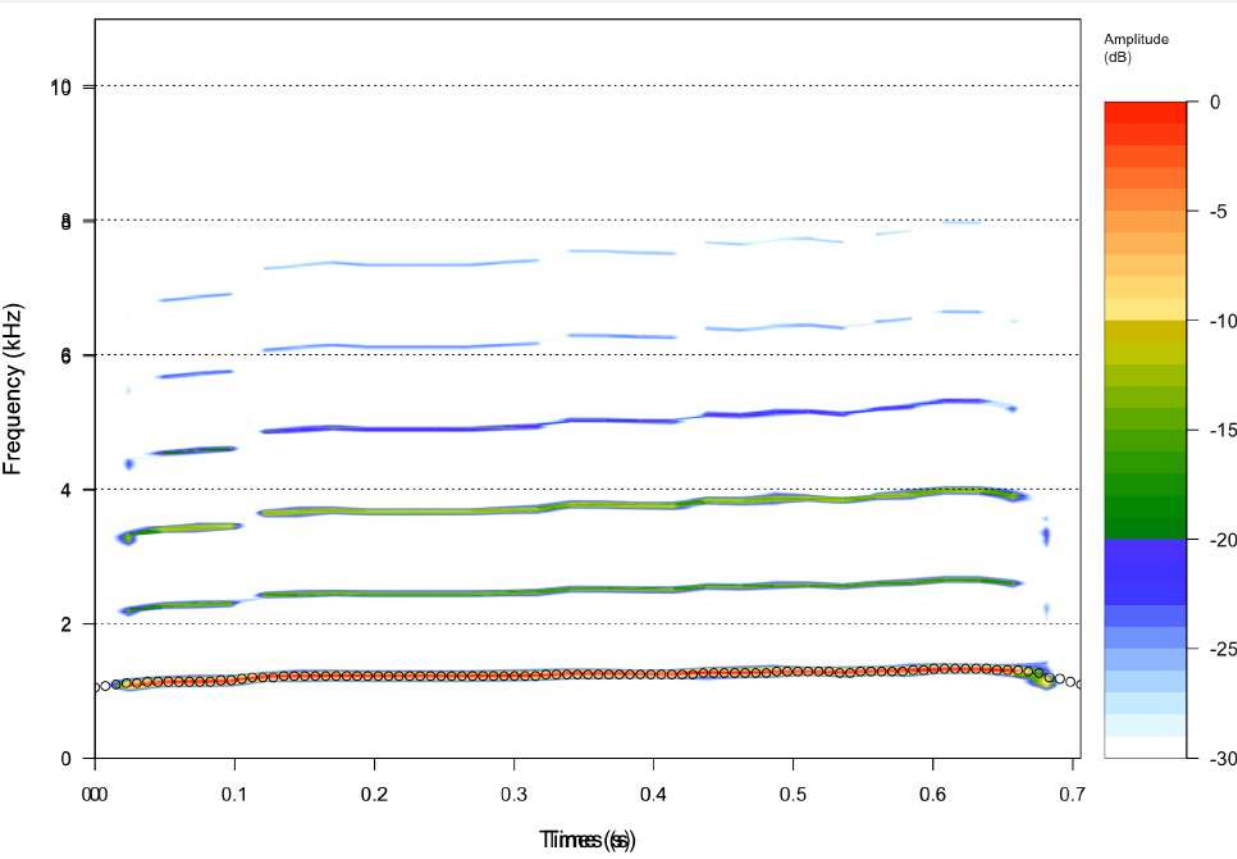spec(peewit,f=22050,dB="max0",col="blue")

spec(peewit,f=22050,at=0.5)

Seewave - timer

timer(tico,
f=22050,
threshold = 5,
msmooth=c(50,0)
)

Seewave –dominant frequency

> spectro(peewit)

> par(new=TRUE)

> dfreq(peewit, wl=1024, ovlp=85)

Session 5 – Handling Bioac Data

Exercises - Presenting (Kaleidoscope) data output using Excel/Shiny/R
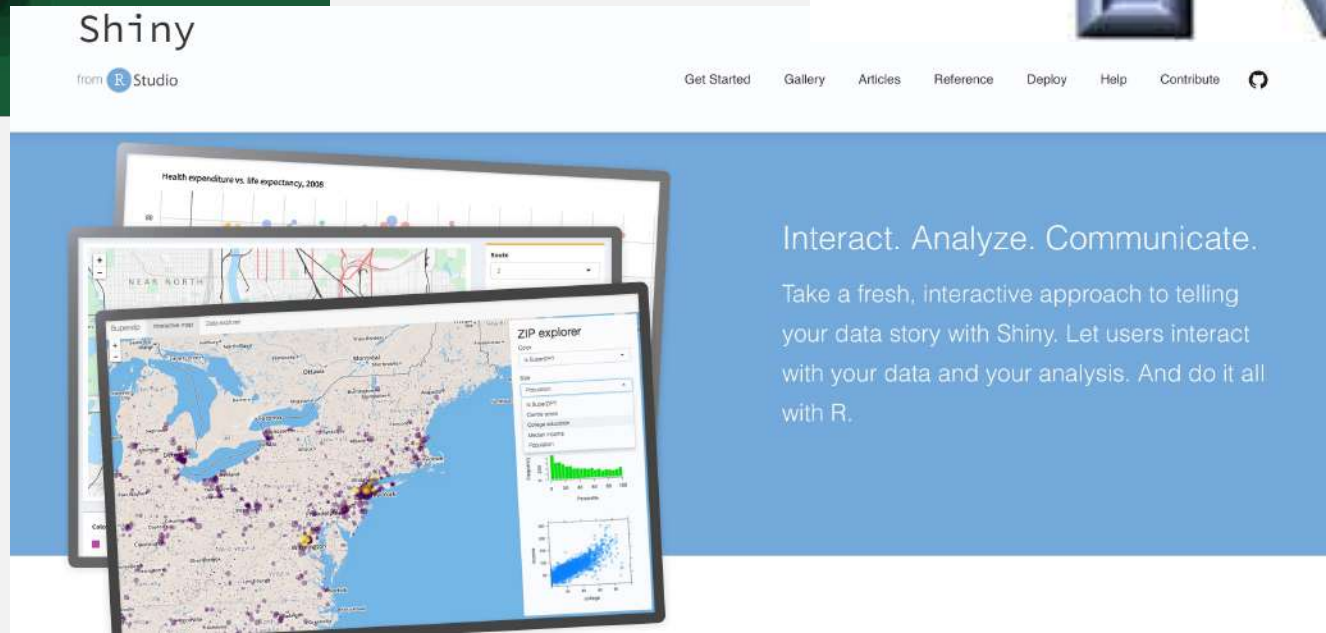
Shiny

https://carlosabrahams.shinyapps.io/Bat_Data_Summary/

Needs completed Manual ID column

https://batplotr.shinyapps.io/beta04/

Works with Kal Pro and Analook data

R – Explore and Plot Dataframes

```r
# Kaleidoscope Data Summary Analysis
# Requires automated and manual IDs to have been assigned


# Make packages available in this script
library(tidyverse)


# Clear R memory to avoid accidental duplication of data
rm(list =ls())


# Get data using select file location, sort and display
bat_data <- read.csv(file.choose())


#Check data structure and content
glimpse(bat_data)


# Give count of number of files of each species
count(bat_data, MANUAL.ID)


# Number of files by night by species, using Table function in BASE
with(bat_data, table(MANUAL.ID,DATE.12))


#Filter out 'noise' and 'check' IDs
bat_data <- filter(bat_data, MANUAL.ID != "Noise" & MANUAL.ID !=
"CHECK")


# Number of files by night by species
bat_data %>%
  group_by(MANUAL.ID,DATE.12) %>%
  tally
```

```r
# Plots - Time Bar chart
ggplot(bat_data, aes(x = HOUR, fill = MANUAL.ID)) +
  geom_bar() +
  theme_bw() +
  xlab("Time (24hr)") +
  ylab("Number of Files")


# Plots - Folder (Detector location) Bar chart
ggplot(bat_data, aes(x = FOLDER)) +
  geom_bar(width = 0.4) +
  theme_bw() +
  xlab("Folder (Detector Location)") +
  ylab("Number of Files")


# Plots - Manual ID Bar Chart
ggplot(bat_data, aes(x = MANUAL.ID)) +
  geom_bar() +
  theme_bw() +
  xlab("Manual ID") +
  ylab("Number of Files") +
  coord_flip()


# Plots - Date Bar Chart
ggplot(bat_data, aes(x = DATE.12, fill = MANUAL.ID)) +
  geom_bar() +
  theme_bw() +
  xlab("Night/Date") +
  ylab("Number of Files")


# Plots - Facet view of Manual ID Bar chart by location
ggplot(bat_data, aes(x = MANUAL.ID)) +
  geom_bar() +
  theme_bw() +
  xlab("Manual ID") +
  ylab("Number of Files") +
  facet_wrap(~FOLDER) +
  coord_flip()
```