

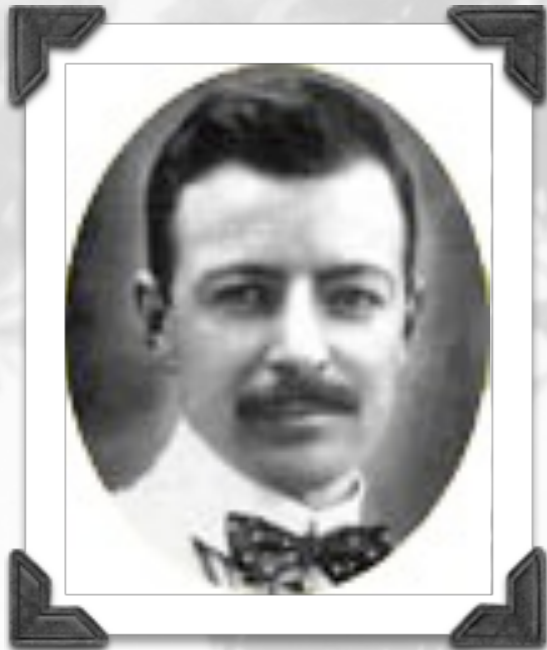
THE FUNDAMENTALS OF IDENTIFYING BATS ACOUSTICALLY: Towards Improving Field Survey Techniques

Susan Koenig, DFES
Windsor Research Centre
windsor@cwjamaica.com

23rd June 2015
Kingston

Seminar funded by:

MacArthur
Foundation



Harold Anthony
(AMNH)

Bats in Windsor (1920)

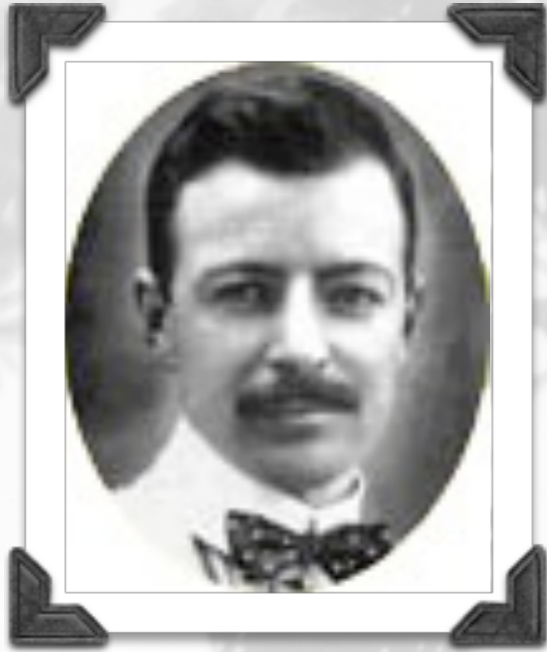
Pteronotus parnellii

Pteronotus macleayii

Pteronotus quadridens

Macrotus waterhousii

Monophyllus redmani



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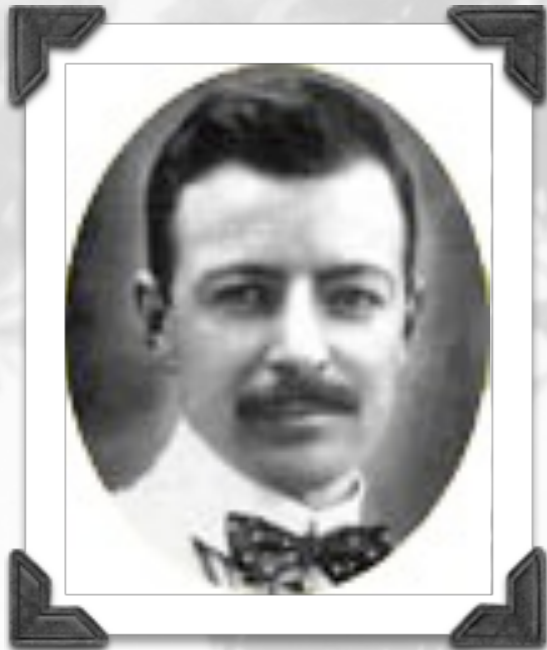
Pteronotus quadridens

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Q: How was Harold Anthony able to identify bat species, esp. given that bats live in dark caves, fly at night ... and human vision is feeble in the dark?





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Bats in Windsor (1920)

Pteronotus parnellii

Pteronotus macleayii

Pteronotus quadridens

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Survey Techniques in 1920

Jan 15: I went out again just at dusk for bats and saw a great many but did not secure any although certain that I hit two or three

Jan 16: Shot one of the bats ... Chilonycteris parnellii. The small Chilonycteris was shot there also, flying about to common.

Jan 18: Saw a bat ... about the house ... I could not secure it although I tried ... with a tennis racket and to shoot it.



~ 1790

Identifying “Echolocation”

Lazaro
Spallanzani



Through experimentation, deduced that the sense of hearing, and not vision, smell, or touch, enabled bats to avoid obstacles in the dark ... but didn't know how, exactly, this worked

Identifying “Echolocation”

~ 1790

1920

Lazaro
Spallanzani

Harold
Anthony

The principle of using echos
to navigate remained
unknown



Identifying “Echolocation”

~ 1790

Lazaro Spallanzani

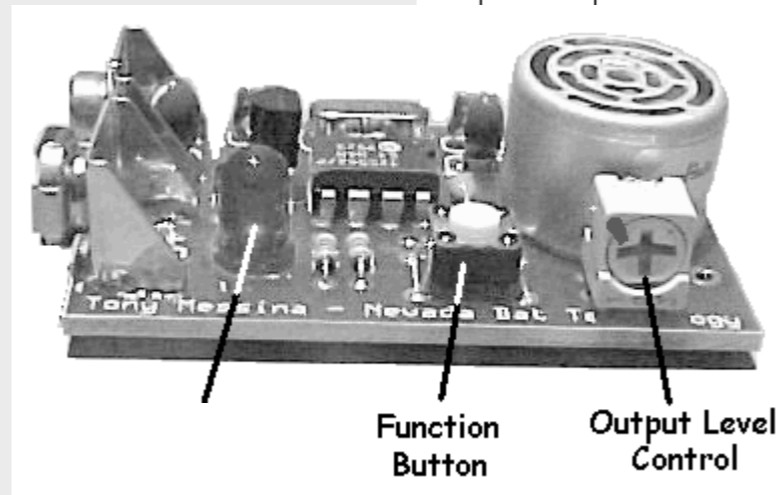
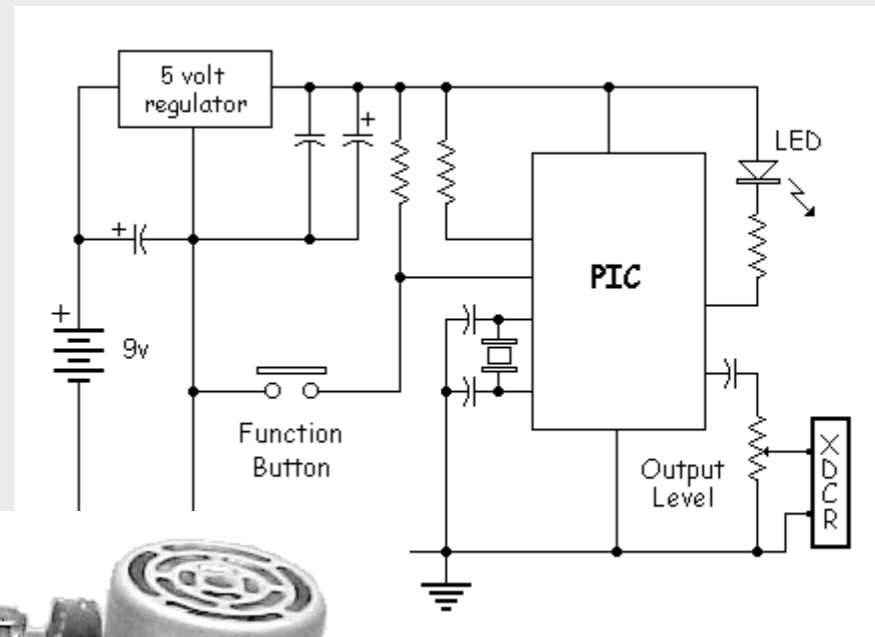
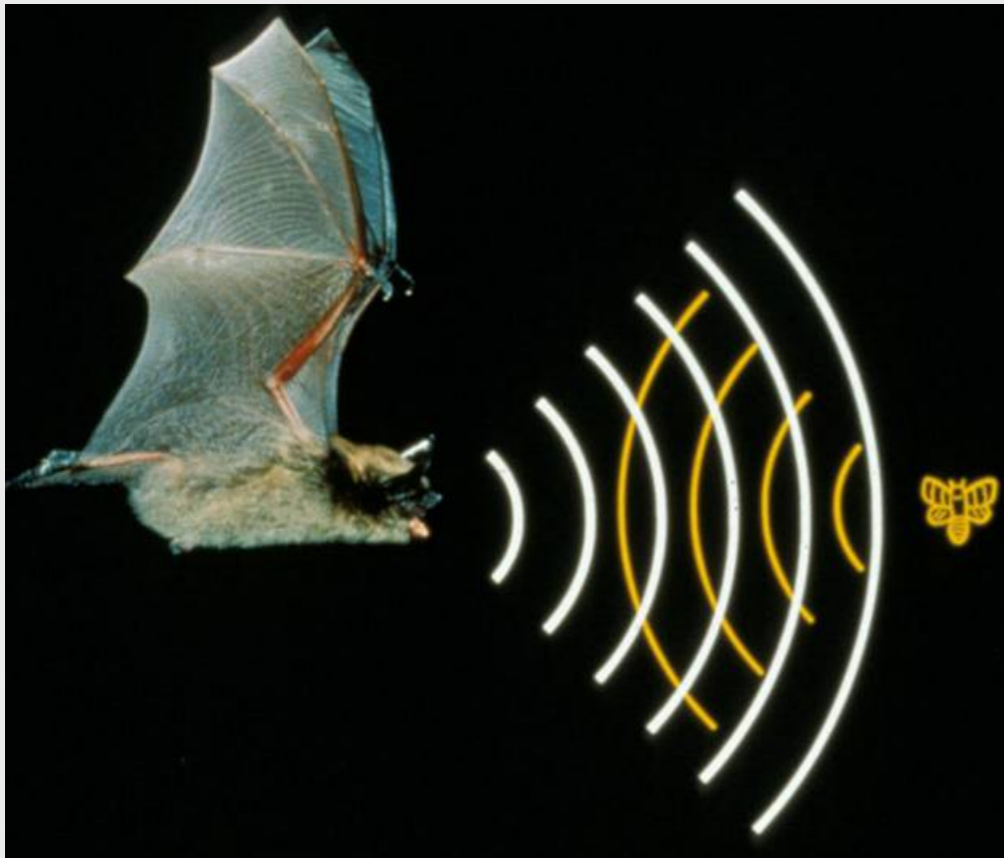
1920

Harold Anthony

Late 1930s

Donald R. Griffin

1st ultrasonic microphone was built -- echolocation was revealed!



Identifying “Echolocation”

~ 1790

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1920

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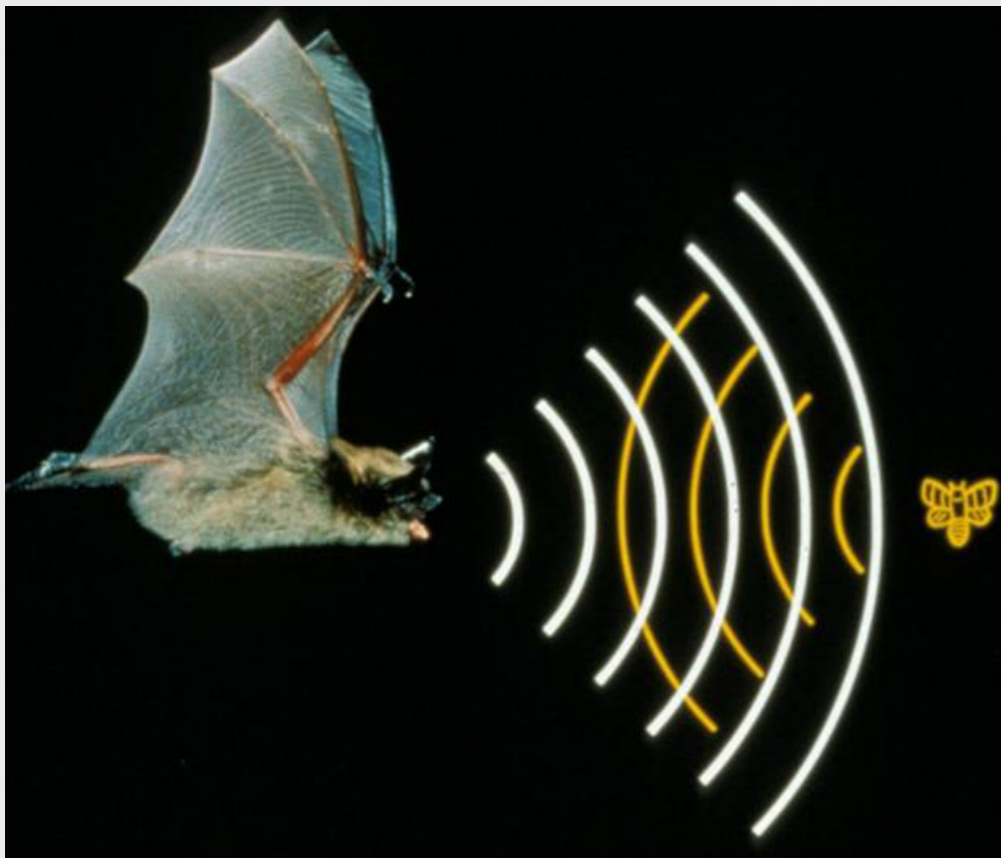
Late
1930s

Donald R.
Griffin

1980s

Holgate,
Anabat

2015



1st commercially
available detectors

Identifying “Echolocation”

~ 1790

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1920

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Late
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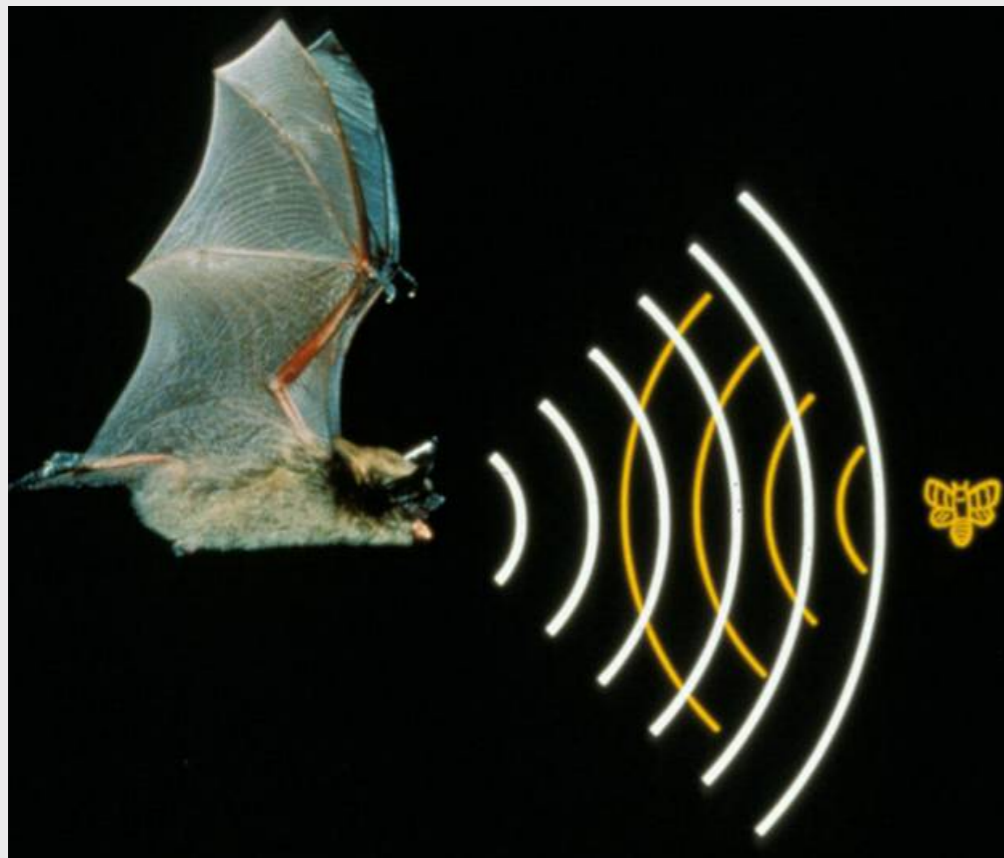
Donald R.
Griffin

1980s

Holgate,
Anabat

2015

Anabat
B.A.T
Avisoft
Batbox
ecoObs
Elekon
Pettersson
Wildlife Acoustics
+ others



Identifying “Echolocation”

~ 1790

Lazaro Spallanzani

1920

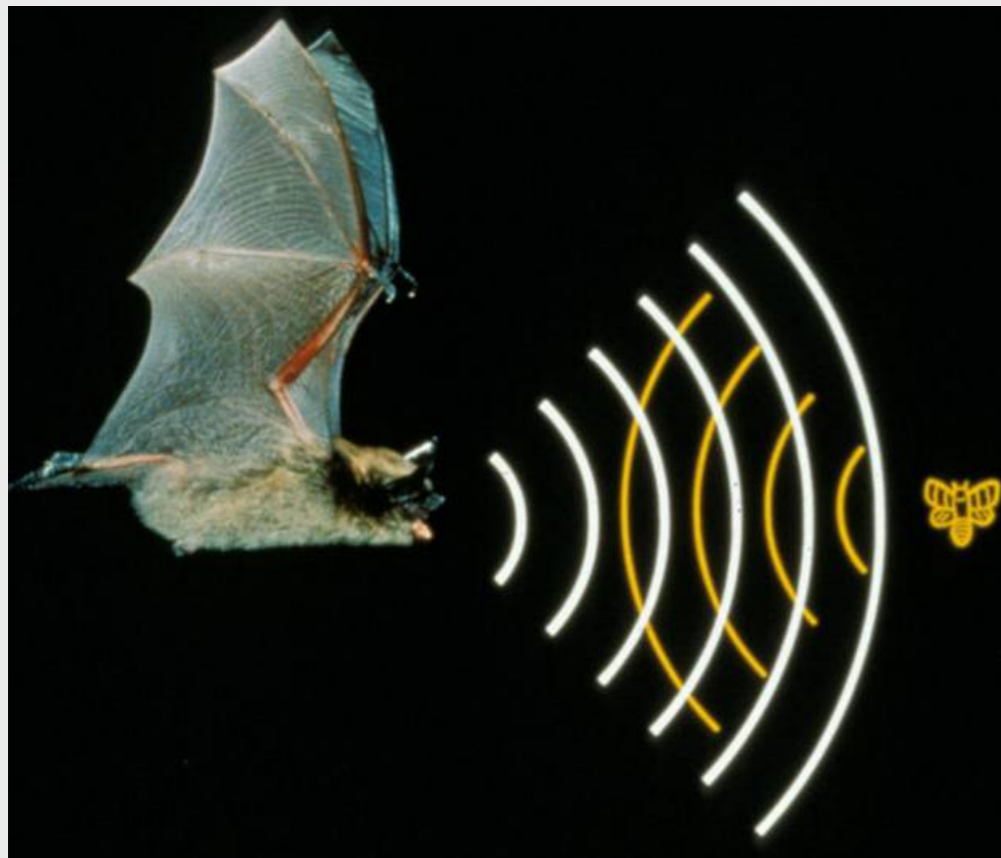
Harold Anthony

Late
1930s

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1980s

2015



Everyone
can now
listen to
& enjoy
bats ...

Identifying “Echolocation”

~ 1790

Lazaro Spallanzani

1920

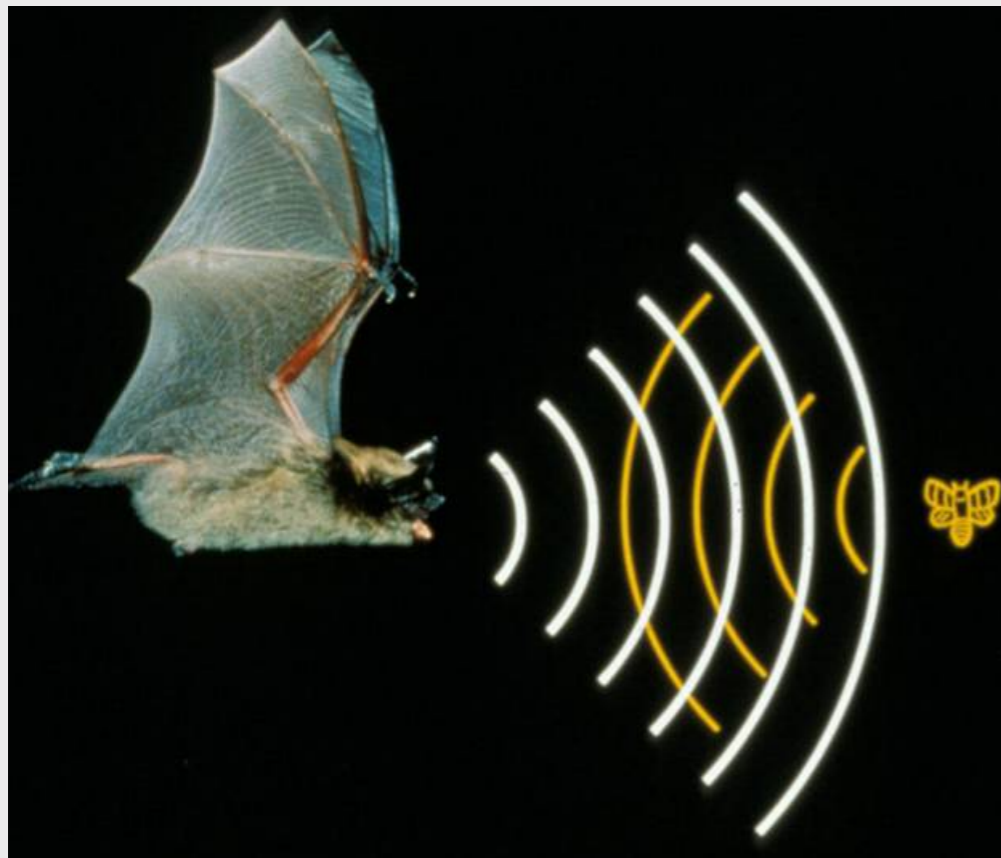
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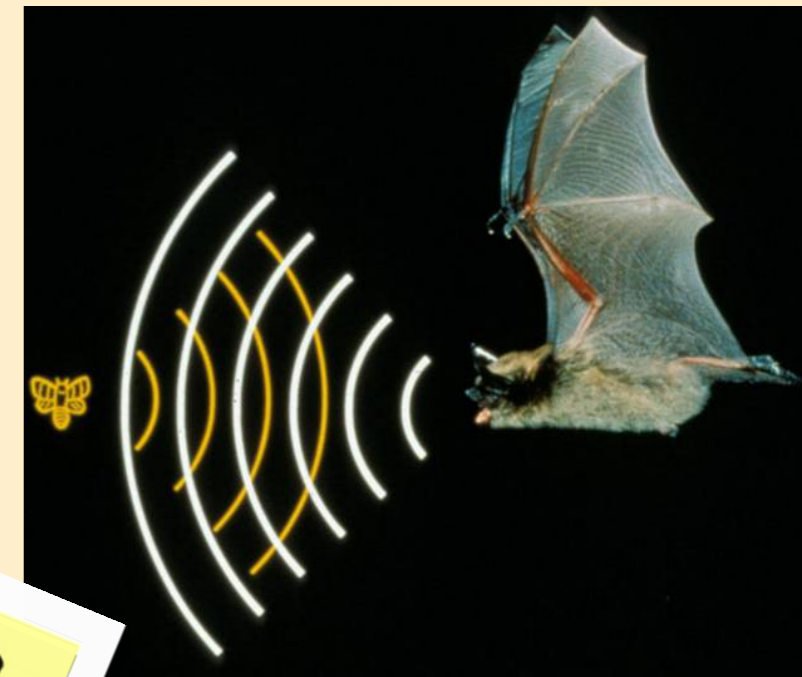
2015



... but we need to understand bats to use detectors correctly

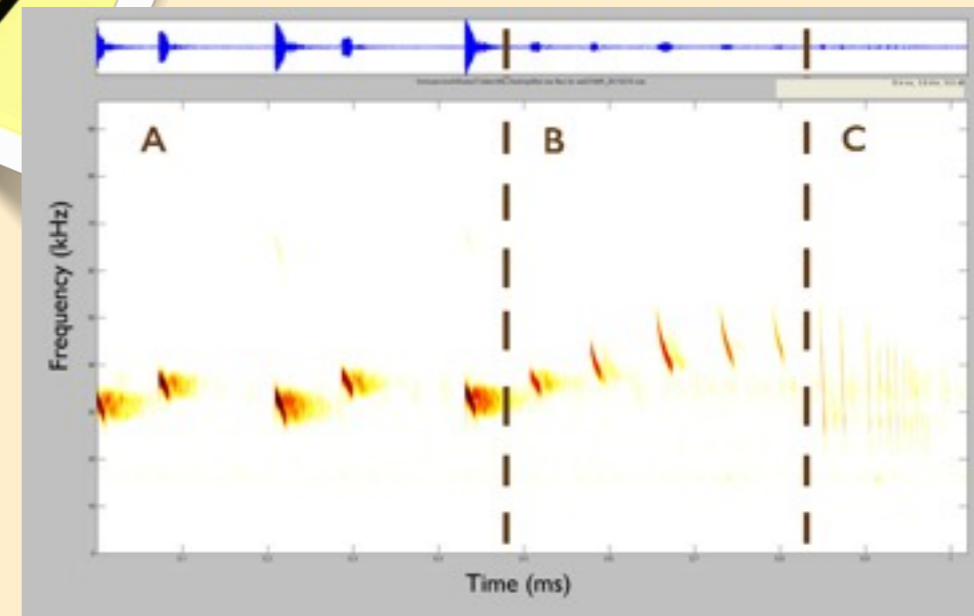


Acoustic Identification & Surveying Bats



I. ToolKit

- Acoustics 101
- Bat Detectors 101
- Software / sonograms
- Jamaica Call Library
- Batscapes: Predicting species
- Batscapes: Reality - bats in Windsor



II. Application: Guidelines for JM surveys