



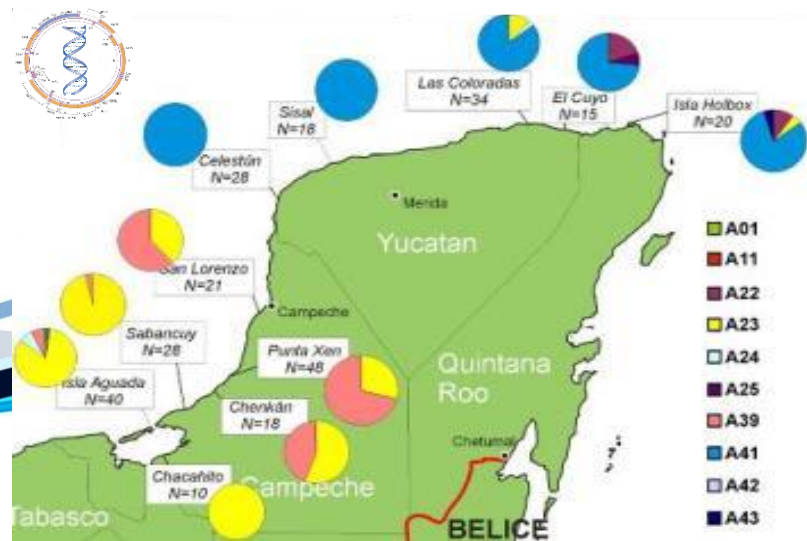
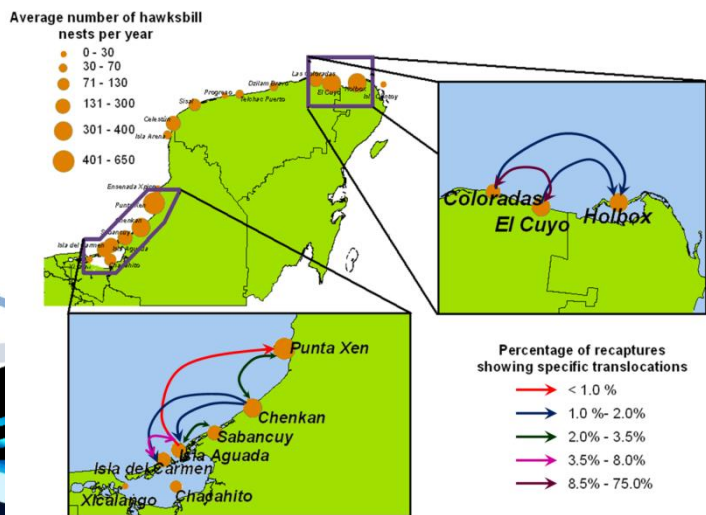
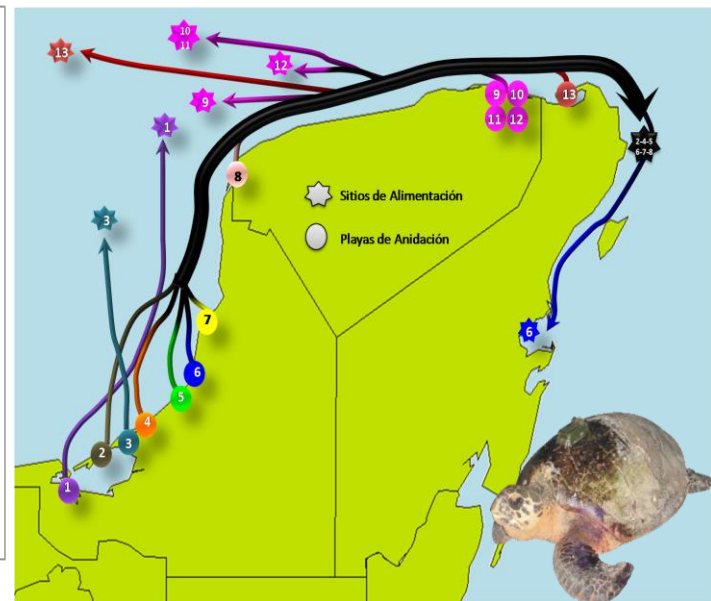
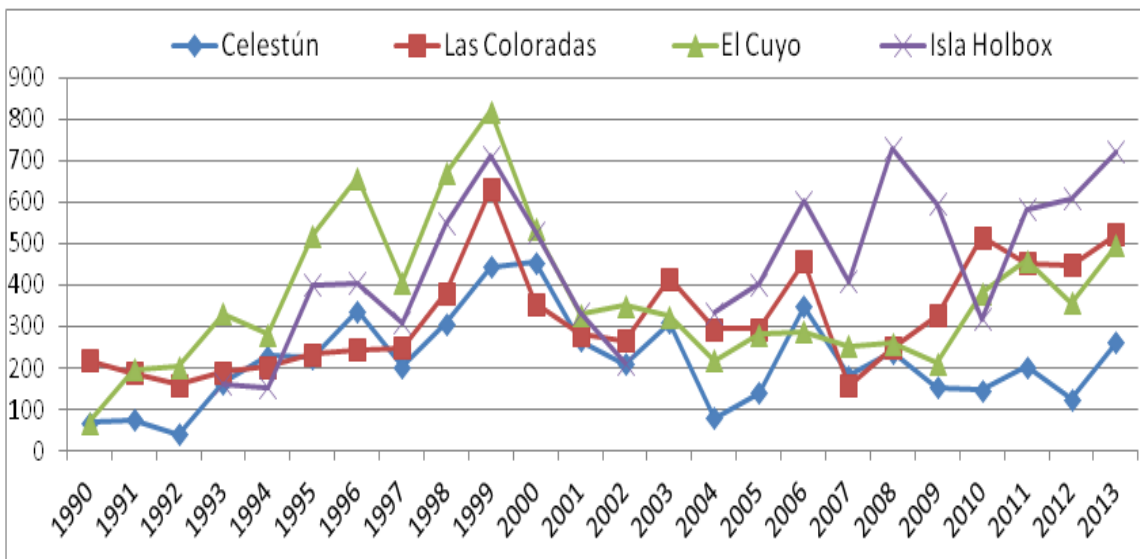
# Hawksbill turtle (*Eretmochelys imbricata*) population genetics at the Yucatan Peninsula

*2015 WIDECAST Annual Meeting  
Maunabo, Puerto Rico*

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# What we know:



# What we don't know:



## About males:

- Is there enough males for all the females?
- Are the same males mating with all nesting females from the peninsula?



## Indirect studies using molecular markers (Microsatellites)

- Genetic contribution
- Multiple paternity
- Gene flow and their implication for populations

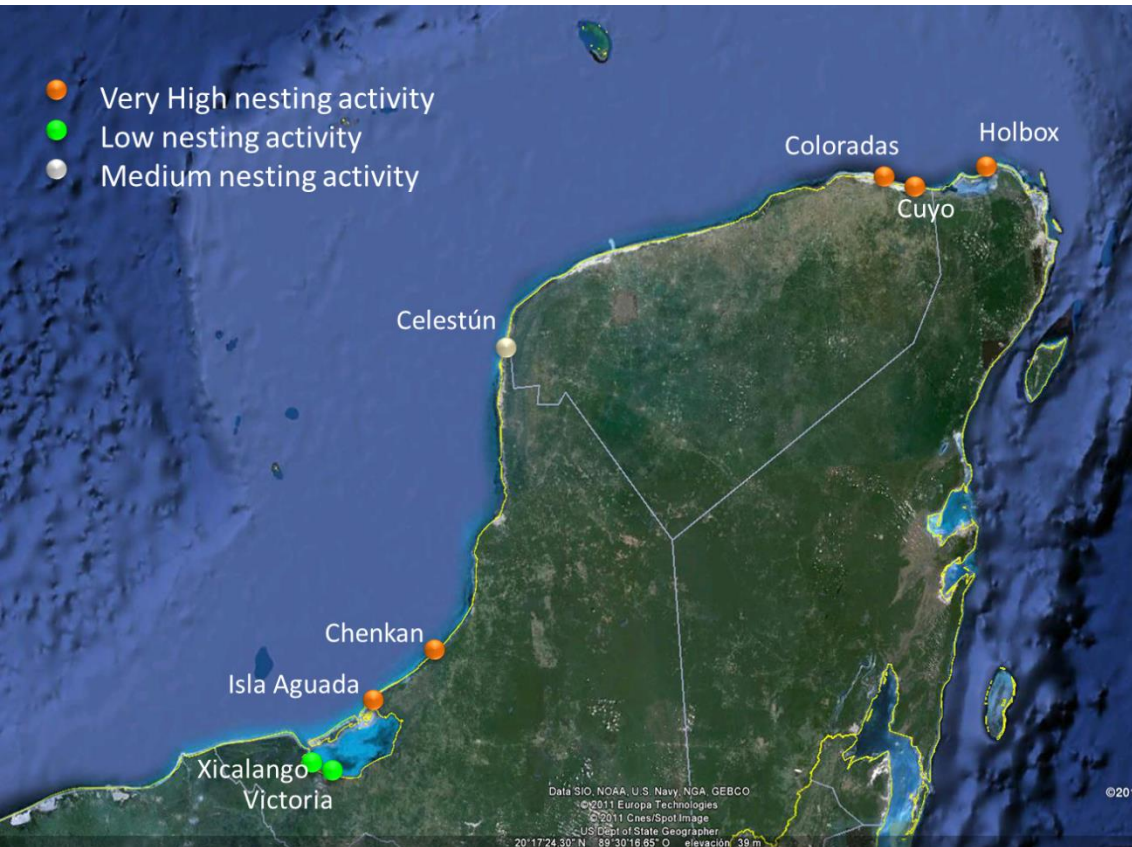
## Hawksbill is poorly studied

- Populations using nDNA
- Only 2 papers assessing multiple paternity (Joseph y Shaw 2010, Phillips *et al.* 2013)





# Field Work / Sampling



# Primers and Samples

HKB24

CC141

CM72

EIM12

HKB32

EI8

CC117

EIM17

EIM6

HKB22

EIM11

EIM31

HKB25

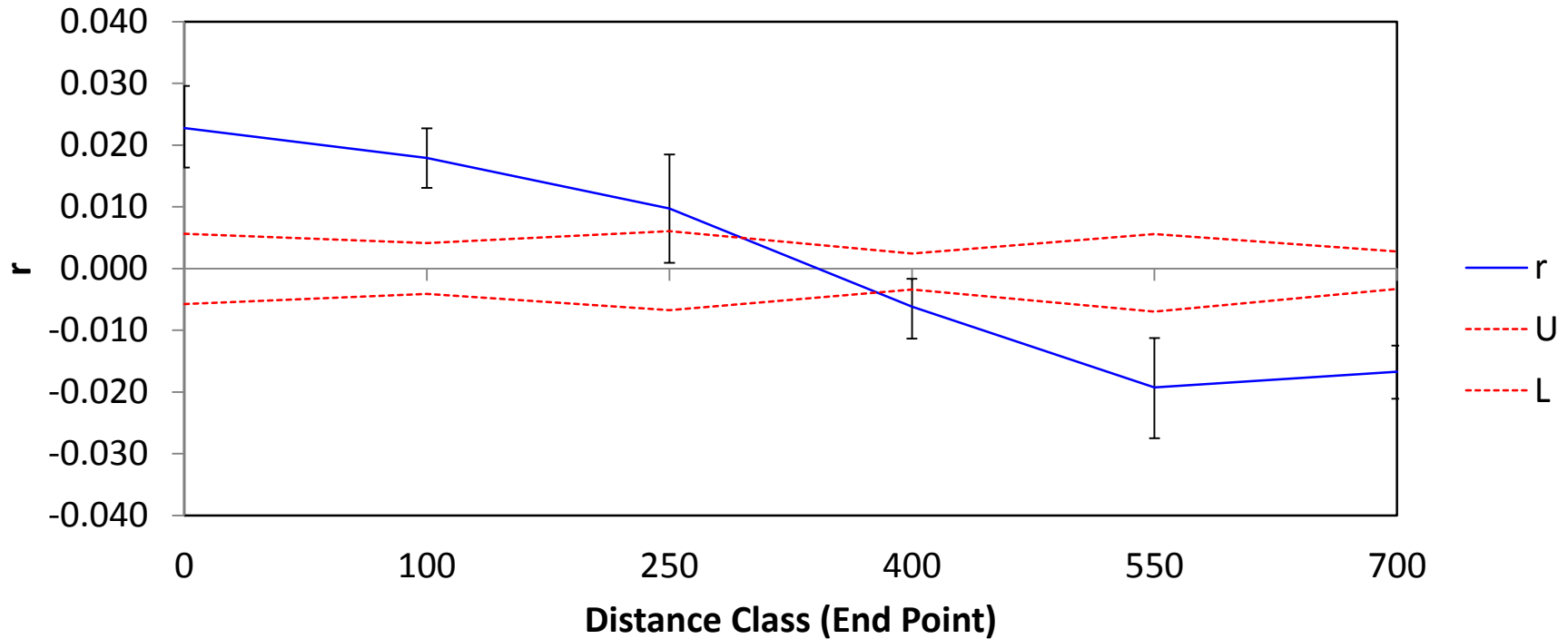
Place	Structure	Multiple Paternity Nests	Multiple Paternity All
Xicalango-Victoria	36	2	52
Celestún	50	9	237
Isla Aguada	57	X	X
Holbox	60	9	259
Las Coloradas	110	4	104
El Cuyo	119	12	310
Chenkán	132	17	456
Chinchorro	X	X	X
Xcaret	X	X	X
Total	564	53	1418
<b>2116 SAMPLES</b>			



# Population Structure



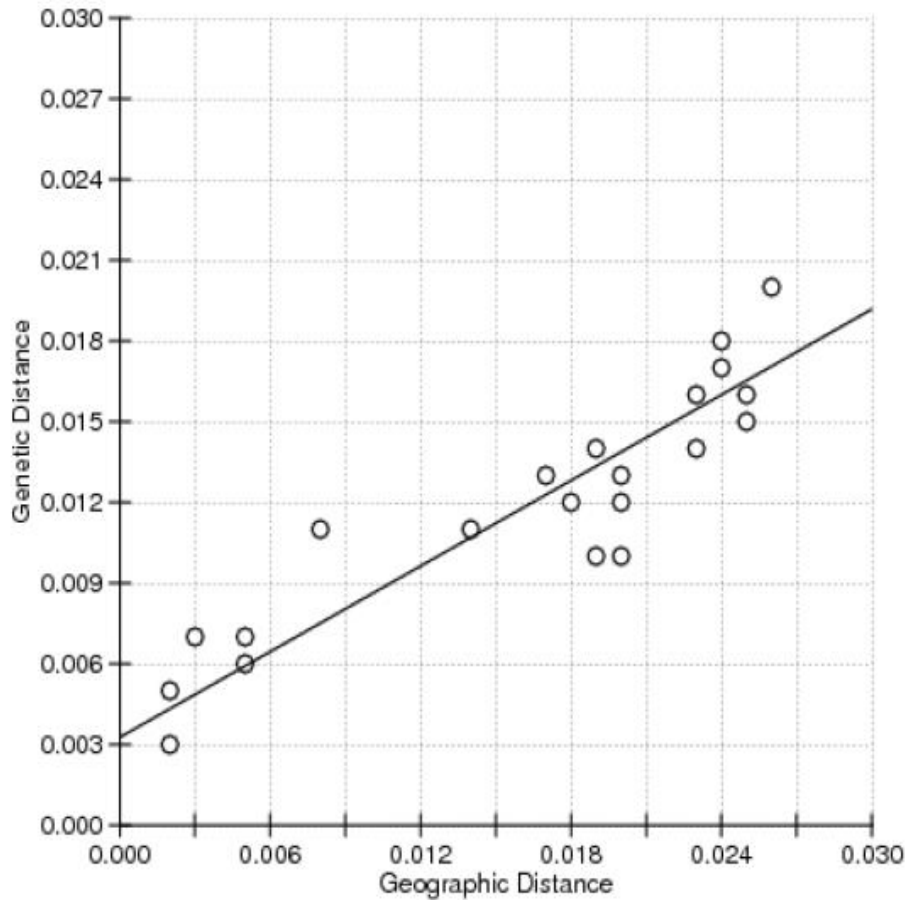
# Spatial Structure



Correlogram plot of the genetic autocorrelation coefficient “ $r$ ” as a function of distance.



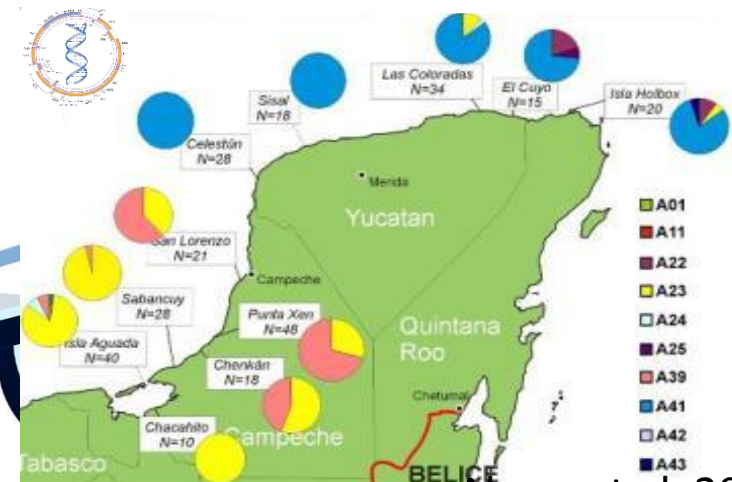
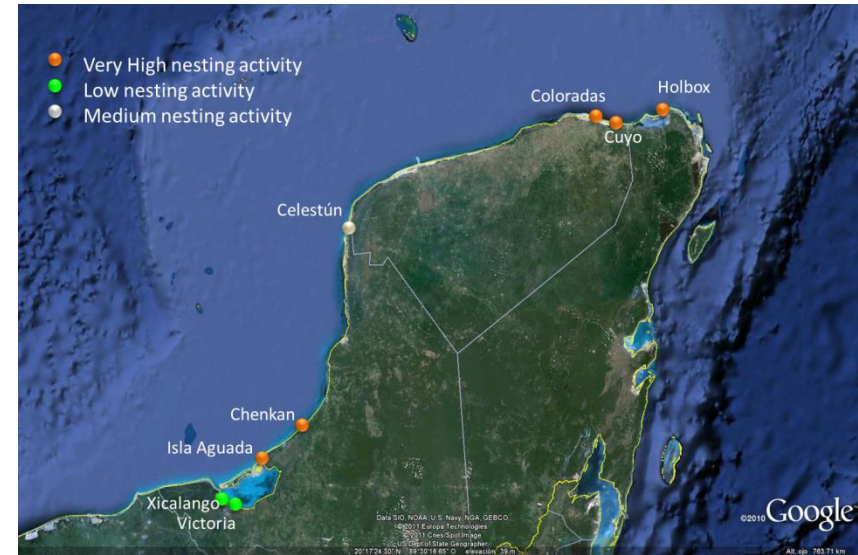
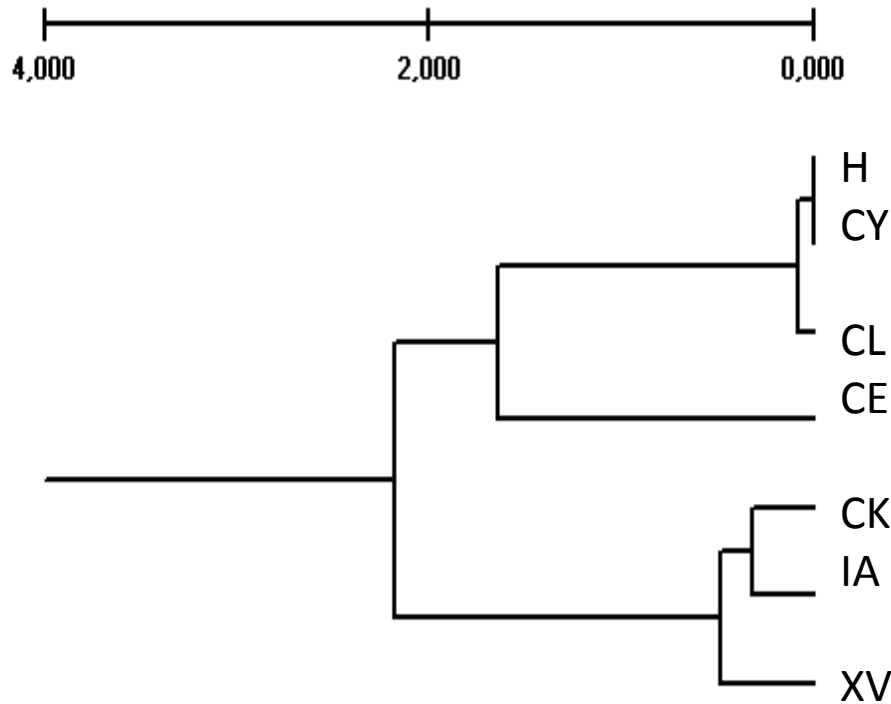
# Isolation by Distance



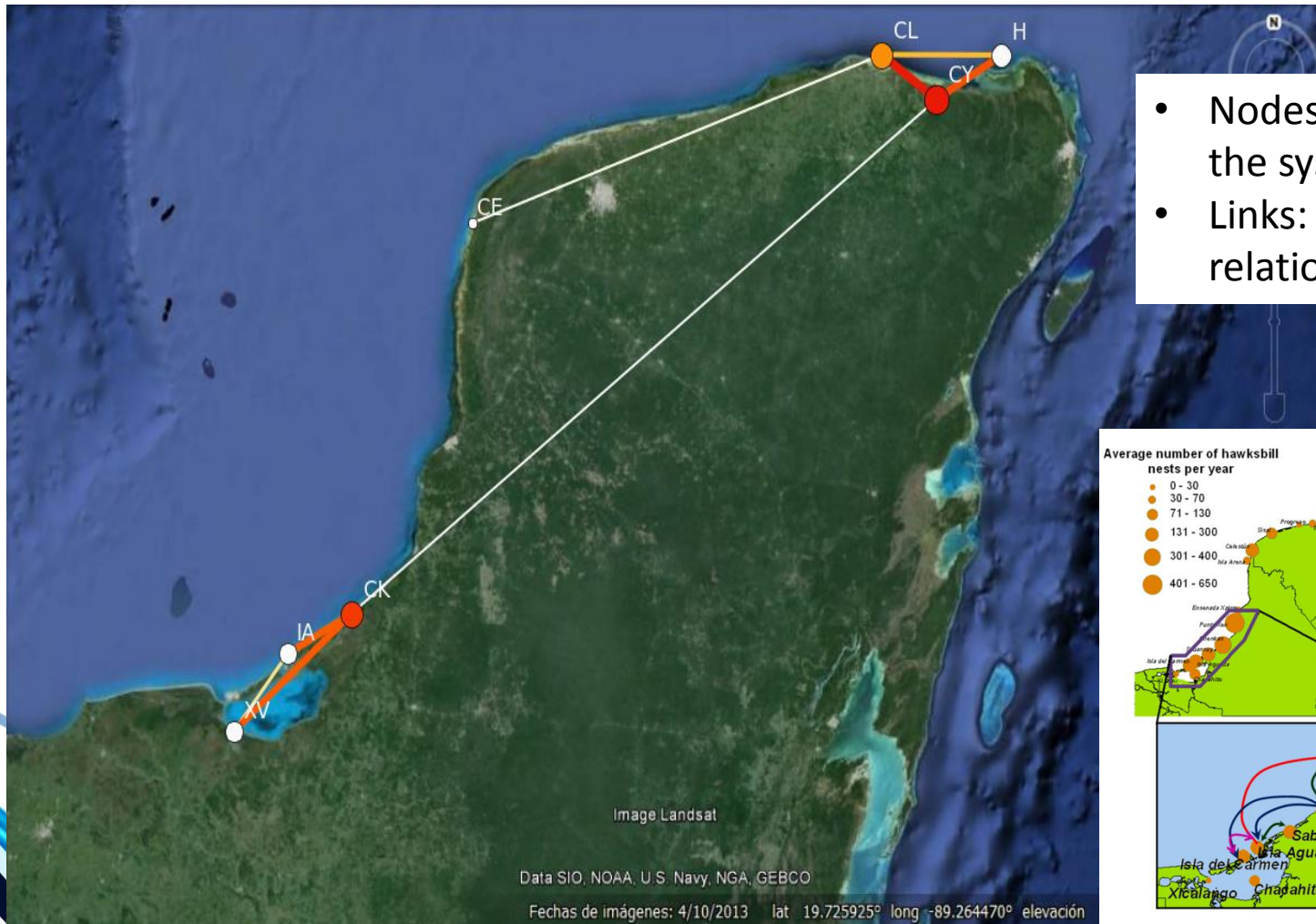
- There is a significant correlation between genetic and geographic distances of the nesting beaches, ( $r=0.9116$ ,  $p<0.001$ ).
- isolation by distance between hawksbill nesting beaches
- whether more distant the populations are, they will be more different genetically.



# Genetic Structure

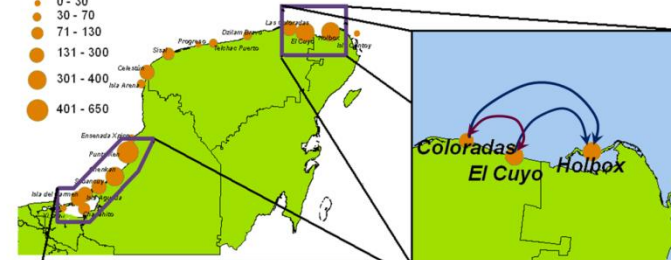
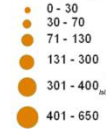


# Network Analysis



- Nodes: fundamental units of the system (nesting beaches)
- Links: interactions or relationships

Average number of hawksbill nests per year



Percentage of recaptures showing specific translocations



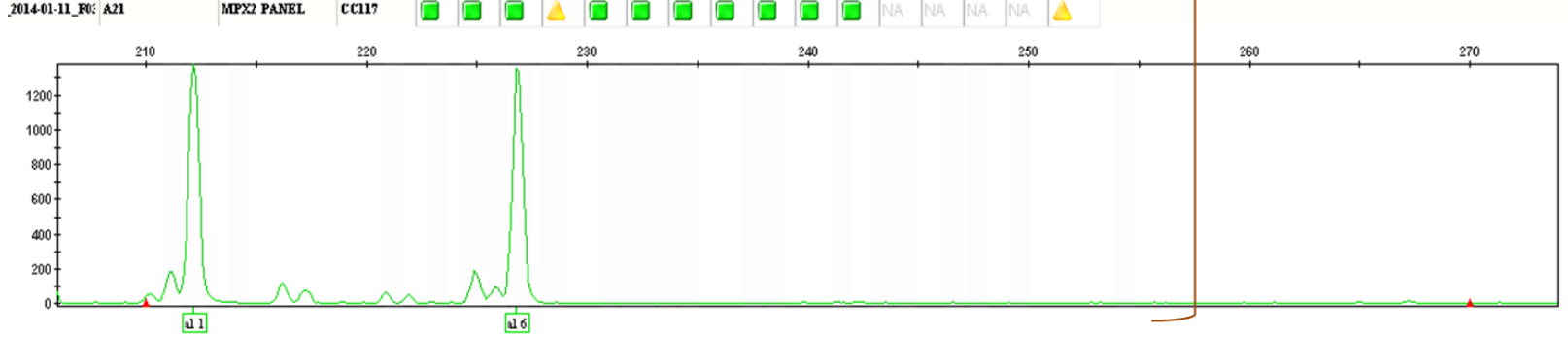
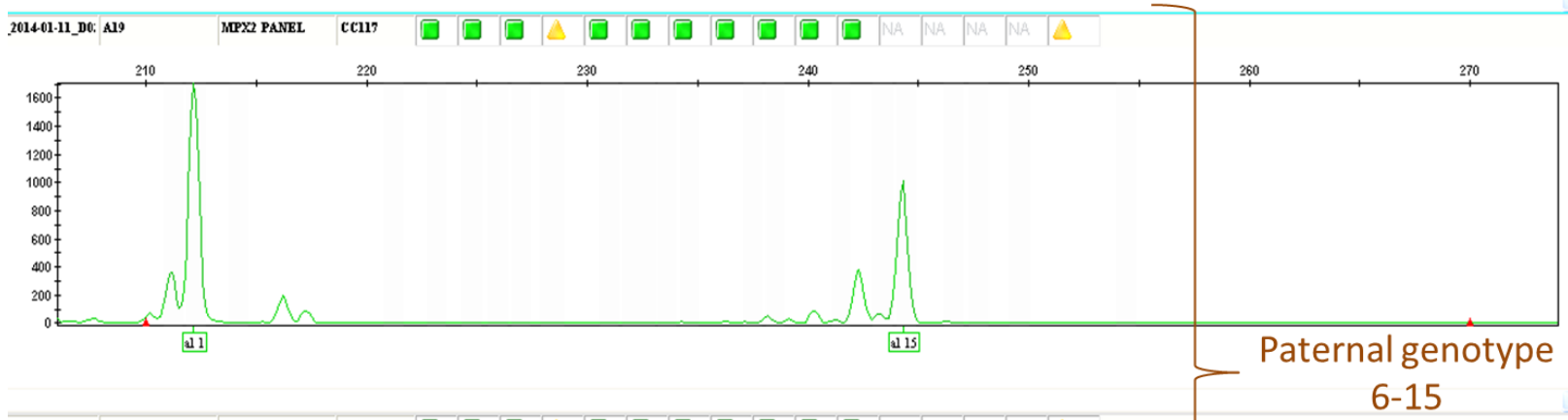
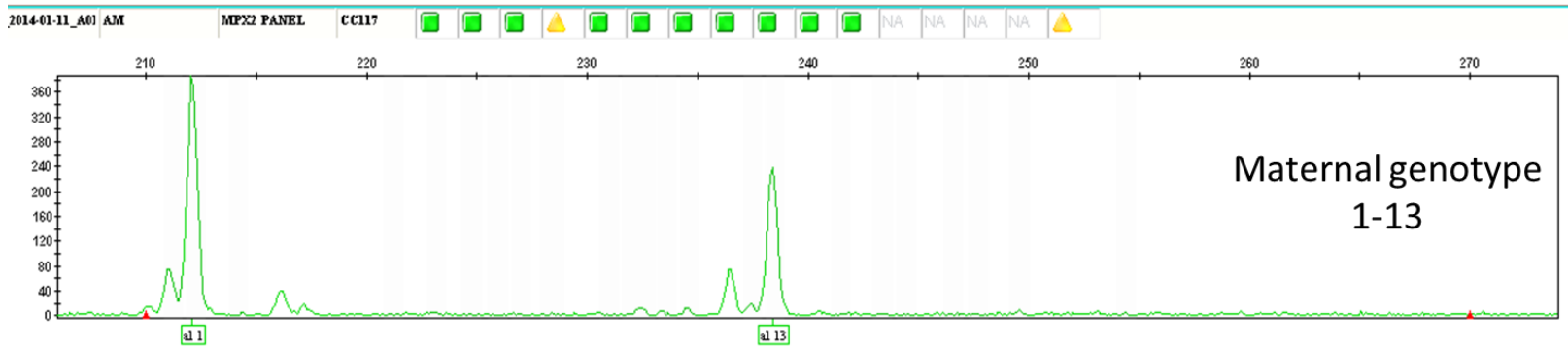
Allele Shared Distance (ASD) which is based on the proportion of shared alleles.

# Paternity Assessment

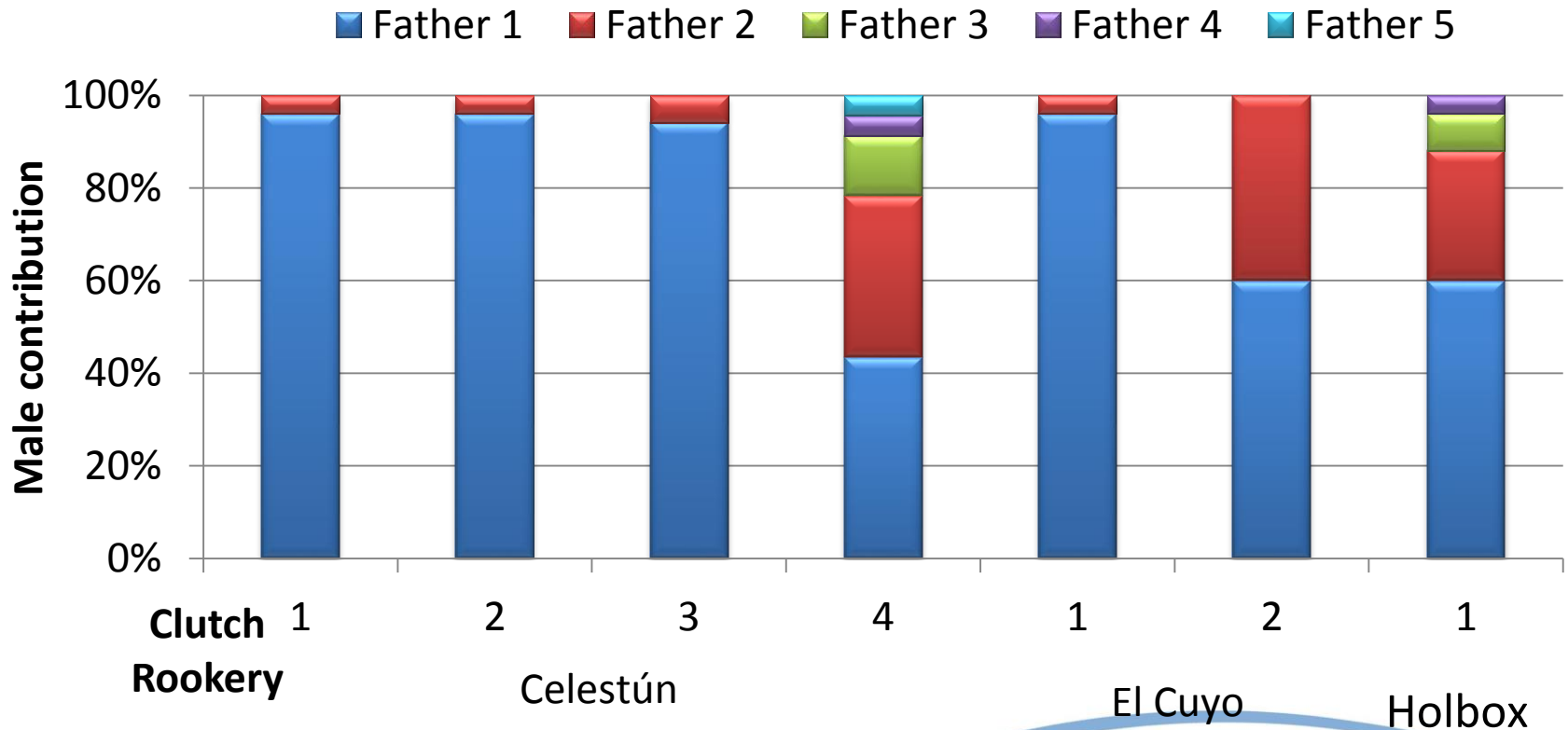




# Paternity Assessment



# Multiple Paternity



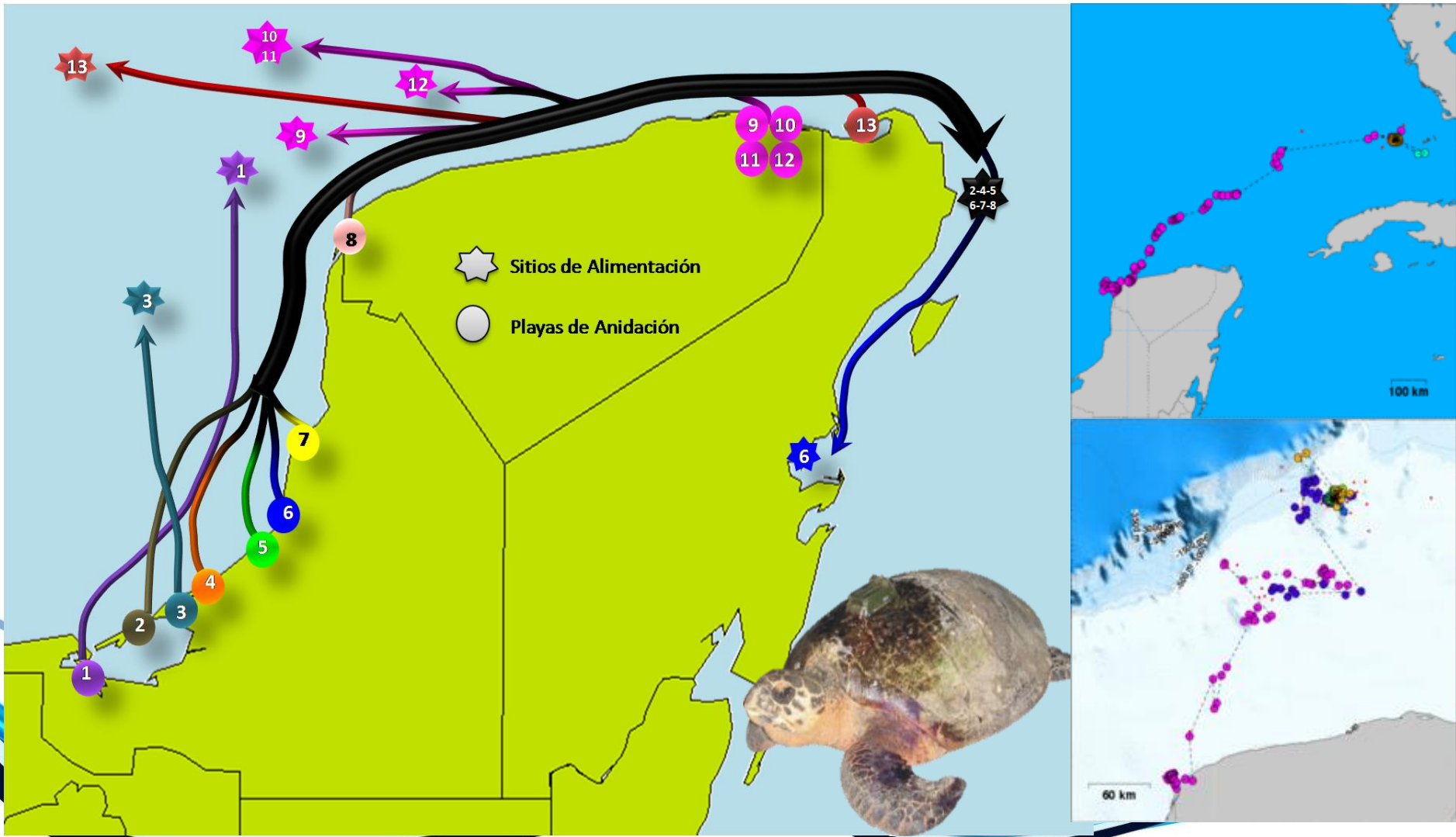
Celestun 44%  
Cuyo+Holbox 15%  
Campeche 0%

Different sex ratio depending on the geographic location



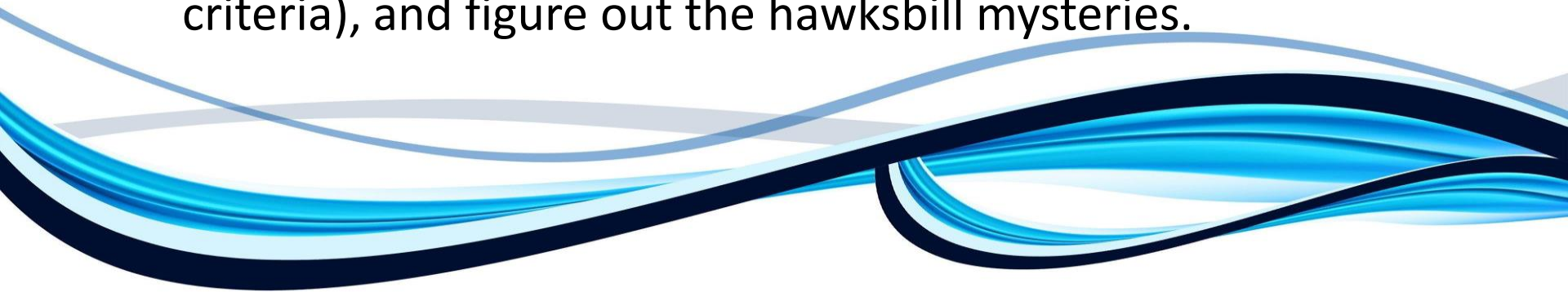


# Satellite Tracking



# Wider Caribbean Network Analysis and Males Information

- Lots of information available for hawksbill in the Caribbean
  - Satellite tracking
  - mtDNA analysis
  - Mark-recapture data
- We can work together and establish protocols about the genetic analysis using nDNA molecular markers (sampling methods, use of the same primers set and data analysis criteria), and figure out the hawksbill mysteries.



# Thank you

