

## RESEARCH QUESTION

Can citizen science data increase knowledge of the spatial distribution of sea turtles?

## HYPOTHESIS

Citizen science data provides complementary and quantitative information about the spatial ecology of sea turtles that can aid in creating international conservation strategies.

## METHODOLOGY

### MATERIALS:

- \*Geographic positioning system (GPS)
- \*Smart phone and/or Tablet
- \*Computer with ArcGIS software
- \*Binoculars
- \*Field Guide handouts and Sea turtle species replicas

### PROCEDURE:

1. Create a visual field guide of all species of sea turtles that can be found in the region.
2. Provide a 1-2 hour workshop that includes fun activities to learn how to currently identify between different sea turtle species, identify habitat types, and register sea turtle sightings.
3. Collect sea turtle sightings via iNaturalist.org or Naturalista.mx
  - A. Presence/absence level: date, time, coordinates in decimal degrees.
  - B. Species-specific, research grade level: above and photos and/or video showing the habitat type and turtle(s)
  - C. Sightings with 2+ turtles of the same species in the same area can grouped together as a sighting.
  - D. Note that if more than one person is registering sightings from a vessel, choose a lead person with binoculars to register sightings and avoid duplications.
  - E. To estimate the number of turtles in a habitat, use the formula: count turtles as they surface to breathe in intervals of 1 minute. Do this for up to 30 minutes. Then take an average per minute for the entire study time to determine relative abundance.
4. Download the data from iNaturalist.org as a XML file and sort into latitude and longitude.
5. Import into ArcGIS for mapping analysis

# A Collaborative Citizen Science Project to Enhance Awareness and Data Collection for Sea Turtle Conservation

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## DATA

Our Sea Turtle Spotter project housed and maintained by iNaturalist.org provides an excellent platform for citizen scientists to register their sea turtle sightings. Below are a few examples of valuable data we receive and use for analysis.

### Eastern Pacific Green Turtles:

Considered threatened in the region, sightings of green turtles provides information of habitat use and spatial distribution



### Hawksbill Turtles:

Critically endangered in the eastern pacific. Each hawksbill sighting provides data of habitat use and spatial distribution



### Artisanal Fishing Communities

Developing trust with fishers allows scientists to gain valuable insight and data into incidental capture of sea turtles and work collaboratively to reduce bycatch, implement best fishing practices, and create local sustainable seafood programs



Upwell's Mexico coordinator Stephanie J. Rousso working together with fisherman Miguel Higuera to remove a sea turtle from possibly the smallest registered juvenile hawksbill turtle in the area, accidentally caught in his bait net less than 5 meters from shore.

## RESULTS

In an undergraduate thesis provided by Honors Student Haley Stapleton from Colorado State University revealed the following results as of November 2017:

\*308 Observers registered 820 sea turtle sightings between 1996-2017 using iNaturalist.org.

\*Most observations are within 20 miles of the Pacific U.S. and Mexico and western Pacific regions.

\*Green and hawksbill species are most frequently observed (62.2% and 19%, respectively).

Sea Turtle Spotter is a project housed on the online iNaturalist.org platform. The project was started by Upwell as a means to effectively register their sightings of sea turtles in Mexico, then it spread globally by anyone with an internet, free account on iNaturalist.org, which is maintained by the California Academy of Sciences.



Sea Turtle Spotter includes a map of sightings. Green circles indicate the sightings into ArcGIS mapping software for analysis. They also contain an array of research observations on citizen science data and the green circles illustrate active research areas of interest habitat use.



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Graphic: Stapleton, H. 2017. The effectiveness of iNaturalist citizen-collected data for monitoring sea turtle populations. Service Honors Thesis, Department of Fish and Wildlife, and Conservation Biology, Colorado State University.