**Whale mAPP:**
Mobile & Web Application to Encourage Citizen Science Contributions of Marine Mammal Sightings
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**ABSTRACT**
Traditional methods of gathering the data needed to map marine mammal distributions and assess human impacts on their populations require extensive time and resources. To reduce the burden associated with collecting and managing marine mammal observations, a geographic information system (GIS) solution was developed using a volunteered geographic information (VGI) approach. Whale mAPP is a system of mobile and web applications that provide easy access for the public to submit marine mammal observations and visualize the results on maps. A mobile application utilizes GPS enabled smart phones to record sightings, automatically track boat path to provide data on effort, and collect photographs which are then transmitted to an online geodatabase that is accessible to researchers and the public. The web application provides users with the ability to query the observations by region, date, and time, visualize sightings directly, and download data in shapefile format. Educational materials on the website include basic biological information on each marine mammal species along with images and illustrations of identification features. To help encourage conservation efforts, threats to marine mammals are discussed and research efforts highlighted with brief stories, interviews, and videos. Curricular materials with conservation themes are designed for middle school students and utilize ESRI ArcGIS Online software to provide experience with applying the scientific method and helping to improve spatial literacy. The additional data collected by this tool will help supplement the knowledge of marine mammals to aid in research and management efforts.

**MOTIVATION**
Lack of baseline data on marine mammal species, many of which are endangered or threatened

**GOALS**
- Develop mobile & web apps that allows the public to contribute data on marine mammal sightings
- User-friendly features and engaging visuals
- Includes key fields from research surveys to provide necessary and important data
- Instantly maps sightings for visualization of spatial trends
- Trip data synched to online geographic database
- Data shapefiles are freely available for use in research, management, and education

77 Beta Users
1,841 marine mammal sightings during 301 trips from areas in:
- Alaska
- British Columbia
- California
- Caribbean

- Interface designed with public user in mind
- Tracks collected from internal GPS chip
- Provides effort data for statistical analyses

**WHAT'S NEXT?**
- Release an iOS version of Whale mAPP and promote to expand user base
- Revise fields and functionalities based on user feedback
- Develop database and photo-ID capabilities to facilitate collaboration
- Develop and assess curricular materials to teach spatial skills
- Create video clips to highlight research and conservation efforts
- Complete analyses of usefulness for research, along with educational impact

**WEB INTERFACES**
- Query sightings by user, dates, and species
- GIS maps of data

Formal surveys of beta testers in SE Alaska by Courtney Hann:
- Majority using due to interest in marine mammals (77%) but 50% also interested in citizen science
- 86% enjoyed using it and 90% would recommend Whale mAPP
- Main suggestions: edit data during trip, more details on behaviors

"...our passengers loved that I was...sending in information...it gives us a better sense of purpose"

User Perspective on Components of Whale mAPP

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