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2015 Summer GIS internship in Archipelagos, Institute of Marine Conservation

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GIS intern in Archipelagos, Institute of Marine Conservation

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A MASTER'S PROJECT

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in partial fulfillment of the requirements for the degree of

Masters of Science in Geographic Information Sciences for Development and Environment

in the Department of International Development, Community, and Environment

And accepted on the recommendation of

Yelena Ogneva-Himmelberger, Ph.D., Project Advisor

ABSTRACT

My summer internship is in Archipelagos, Institute of Marine Conservation, starting from June to July of 2015. My work includes manipulating geospatial data, conducting analysis, and creating maps for the conservation work in Archipelagos. This report introduces the organization of the internship, the detailed content of work I have done for this internship, and the assessment of the internship.

ACADEMIC HISTORY

Name:	Date:
Mengyi Chen	June 2016

Baccalaureate Degree:

Bachelor of Science

Source:	Date:
Zhejiang Normal University	June 2014

ACKNOWLEDGEMENTS

First of all, I would like to thank Prof. Yelena Ogneva-Himmelberger. Not only does she give me academic advice, but also she informs the internship opportunity to me.

Besides, I would also like to thank my supervisor and other colleagues, who help me to get involved to the new working and living condition and give me help in work.

Most importantly, I am really that parents support me to go abroad for further education. Going to Clark University is a unique experience, which would benefit my work competitiveness.

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CHAPTER 1: INTRODUCTION

The 2015 summer internship is required for the Geographic Information Science for Development and Environment (GISDE) Master program at Clark University to gain experience to apply GIS to the real-world problem. The internship that I took on lasted for 60 days, from the beginning of June to the end of July. I worked as GIS intern in Archipelagos, Institute of Marine Conservation in the island of Samos, Greece. A few GIS skills that I learned and was able to apply to, in this internship included manipulating geospatial data, conducting analysis, and creating maps. I also acquired new skills such as learning to scuba dive and monitoring species in their natural habitat. I had learned in the classroom, such as manipulating geospatial data, conducting analysis, and creating maps. I also gained some new skills, such as scuba diving and animal monitoring.

This internship paper is organized into multiple chapters regarding the organization, internship responsibility, and assessment of my experience at the Archipelagos. Chapter 2 will focus on the background and main work of the organization, as well as the brief description of the GIS team. Chapter 3 will focus on my responsibilities and work in the internship. Chapter 4 will focus on my assessment of the internship, including the skills I learned and how this skills related to my academic and career goals. This paper ends with an appendix that support Chapters 2-4.

CHAPTER 2: DESCRIPTION OF ORGANIZATION

2.1 History and Background

The Archipelagos Institute of Marine Conservation is a Greek, non-profit, non-governmental, environmental organization founded in 1998 by Thodoris Tsimpidis. In the beginning, Archipelagos was built with the mission to conserve the marine and terrestrial environment of the Aegean Sea at first. In the past two decades, the organization developed and built research bases and stations on eight islands in Aegean Sea. Samos Island is where the organization's headquarter is.

Samos is located in the Eastern part of the Aegean Sea. The population of the island is approximately 34,000 inhabitants. The capital town is Samos Town and is also known as Vathi. The average climate is hot and windy during the summer yet severely cold in the wintertime. The island is also famous of biodiversity in both marine and terrestrial species, which provide the main site for the whole research team for coastal ecosystem and terrestrial research near the town of Pythagoreio on Samos Island. There is the labs located in the capital town, which was donated by the University of the Aegean.

2.2 Mission and Main Work

The main mission of Archipelagos is to study environmental condition of the Aegean Sea and to implement actions for its conservation. The conservation value of Aegean Sea is high and well known due to its high levels of biodiversity. However, currently, there are no real efforts to protect this natural resource. The organization is currently attempting to use scientific research to assess the ecosystems condition and to make good conservation decisions.

Archipelago's main areas of focus could be divided into two part: marine wildlife conservation and terrestrial wildlife conservation. The marine wildlife conservation includes marine mammals, fisheries, coastal ecosystems, oceanographic research, as well as water quality, pollution assessment. The terrestrial wildlife conservation includes island fauna, with a particular focus on endangered species such as chameleons, jackals, bats and birds, Island flora, pollution and human impact assessments (Archipelagos website). As the organization developed, nowadays it also work on organizing the university field courses.

2.3 Organization Structure

Scientists, experts, recent graduates and students work at Archipelagos' research bases and stations around the Aegean islands throughout the year. Teams comprising of 25 – 65 people from all over the world, who actively work on the various projects come from a wide background of specialties and skills (Archipelagos website).

Research teams can be divided into two groups, who are led by two team supervisors. The group size are depended on the number of volunteers. For now, the marine conservation team have a larger group than the terrestrial team ~~do~~, so it has a sub-team including the marine mammal team, the fisheries team, and the micro plastic team, and the latter group work on testing the micro plastic in the sea water.

2.4 GIS team

During the summer time, I was the only person who work on GIS, so GIS team is equal to me. It is not in either marine wildlife conservation group or terrestrial wildlife conservation group, yet it is supervised by the terrestrial team leader. During all field surveys, both marine and terrestrial,

the paths, locations and relevant points of interest are all marked and recorded so that a database of GIS material can be build up (Archipelagos website). The GIS team is responsible for the following tasks:

- Collecting of log tracks, locations and points of interest with a GPS Device in field work.
- Downloading the additional GIS information from external sources.
- Creating maps for the projects using both raw and secondary GIS data.
- Performing GIS analysis of both marine and terrestrial habitats and ecosystems.

CHAPTER 3: INTERNSHIP RESPONSIBILITIES

3.1 Overview

As the GIS Intern, I cooperated with different teams in Archipelagos and also performed GIS work for numerous projects. I was exposed to a great deal of data and gained the experience of corporation with people without GIS background. In addition to mapping work, I was involved in the field work and earned some relevant field work experience.

Archipelagos does not have a GIS team as a separate department within the organization. Instead, mapping and analysis tasks were performed by people who have previous knowledge of GIS in the research team, or by the GIS analysts supervised by terrestrial team advisor. With so few specifically GIS-focused personnel, projects must be handled simultaneously and both time management and data management are crucial.

3.2 field work

The GIS computer maintained a large number of dataset~~, which could be~~ used in mapping tasks. I had the responsibility of maintaining, updating, and supplying the data for the various mapping projects. I was also invited to perform some field work, including: bird watching, chameleon surveying, and seal watching, among other tasks.

For a specific task where researchers were surveying jackals, they set cameras and food in several observation sites at during the day. This camera recorded the jackal's behaviors at night and researchers estimate the direction and distance of jackals from the observation point depending on

the sounds from jackals. The jackals' observation map (Figure 1) is made using the observation points where the direction and distance estimated.

The volunteers also monitored a monk seal with abnormal behavior every day. The monk seal does not live in the caves like most of the species do but show up around human beings and bite swimmers in the sea. One task I had was to monitor this creature every two week from 9am to 9pm. For 12 hours, volunteers had the responsibility of finding the seal and recording both the track and the behaviors of the seal. The data collected is then used for the research about the abnormal behavior and for researchers to attempt to solve the aggressive behavior that the deal displays around humans.

3.3 GIS Projects

As previously stated, I worked on a variety of projects during my internship in Archipelagos for the duration of my internship. My main task related to GIS is to create and design of the survey transects and the sites map, but at times, I cooperated with the social media team. I created the Herpetofauna map (Figure 2) and monk seal distribution map (Figure 3) to put into the Samos Snake Guide and the monk seal poster. These maps will be used for publicity and education outreach towards conservation and the protection of animals in these areas.

Figure 4 shows transects designed for the seagrass survey. Using these transects, researchers dive along this area and record seagrass cover percentage and average leaf lengths in these areas. I also contacted European Space Agency and uploaded the project proposal to try to access the free good quality satellite data. However, there were no data already acquired for the specific study area. So I spent some time downloading the data and used Landsat data for this part of the project.

Figure 5 shows a map I created for the chameleon survey. In the map, they can see the land cover and what has been man-made, and the grids shows the potential survey area. The other biologists will use the map for surveying. They select a random number and survey the same grid of the area with the same number.

Figure 6 shows the amphibian survey map. It is the work showcased as an eight-month reptilian research on the island.

CHAPTER 4: INTERNSHIP ASSESSMENT

4.1 Overview

My internship at Archipelagos was a good experience that gave me the opportunity to explore the future career path. While working at Archipelagos, I learned a number of skills that were not acquired in the classroom. I gained a diving certification, which is useful for further GIS work related to marine research. Through discussions with my supervisor and co-workers, I gained insight into how GIS application is applied in sustainability and conservation research. Since no one else at the office knew GIS, I did a substantial amount of learning individually on the job to teach. The lack of personnel on the GIS team and poor internet connection are two major factors that made my work hard. However, as a result, I learned to do GIS work with limited resources and cooperate with people with no GIS background.

In this small nonprofit environment, I spent a lot of time working on the office cleaning, monitoring animals, and arranging various project instead of working on GIS projects with most of my time. The internship is a great experience for students exploring different career paths but compared to what I actually learned in this internship, the cost of not acquiring new GIS skills were too high. I do not recommend this internship to future IDCE students if they have other internship options.

4.2 Skills

While working at Archipelagos, I had the opportunity to network with colleagues from the social media team, the fisheries team, the micro plastic team, and others. I learned how to effectively communicate with coworkers who are new to GIS. I gain the experience of working on multiple tasks and following strict deadlines. Since I had the chance to take part in the animal monitoring and being part of other field work, I picked up on the precious skills with both spatial and non-spatial data collection, which is hardly

learned in the classroom back in my graduate program. Overall, I was able to use GIS skills I had learned in the classroom, such as manipulating geospatial data, conducting analysis, and creating maps to help with survey mapping and advertisement work.

Besides the skills I earn from the daily work, what I really valued was having this exposure, as I was able to see how small non-profit organizations survive without a lot of resources. Even though the organization is struggling with affording the latest equipment and software and managing itself efficiently, I can still see the small but significant achievements they make in ~~the~~ conservation work.

4.3 Relation to Academic and Career Goals

Overall, this internship related well to my course studies because it required what I already knew so that I could then build upon this base and apply it to a new field. I learned some very practical uses for GIS and map-making, especially towards conservation and environmental applications of GIS, which I have not yet learned in my graduate classes.

The internship gave me some exposure to the role of small-scale politics and budgeting of funds. I witnessed some resource and scheduling challenges which limited the health of the organization. This experience opened my mind up to career-related ideas, so I decide not only to have skills related to technology, but also I should gain funding writing and negotiation skills~~.~~

Having skills in field work and diving skills allow for the possibility to work in the marine conservation field in the future. Working with college students who do not have GIS experience allowed me to view my work to be more like consulting where I must sit down and talk to them in order to understand client's needs and solve the problems creatively. I am sure this ability to work with an open mind and collaboratively with non-GIS people will be vital for my career in the future.

Although most of my work was not always directly related to GIS technology, I was glad to have the experience over the summer and over the course of my internship. Overall, the experience allowed me to experience alternative career choices and work/life situations. I came to realize that I might have a desire to be on a conservation-focused career that will require remote sensing analysis, management, and greater interaction with people across many different disciplines.

CHAPTER 5: CONCLUSION

It was a great experience to work in an international non-profit organization. If I could change one thing about my internship, I realized I would have been more satisfied with the internship if I had the supervisor in GIS field and had more training and advice in GIS. However, I appreciate the opportunity to add a few research skills to my overall skillset and to better prepare myself for a professional career in the GIS field. Throughout the summer, I learned to effectively communicate visual knowledge to those who are not formally trained in GIS and to manage diverse projects and at same time handle to meet deadlines. I am honored to acquire an inside look at the non-profit world, even for a short time, to witness its management problems and to be able to learn from their mistakes. The network that I built in this brief time with young scientists from all over the world may be invaluable to my future goals and work.

FIGURES AND TABLES

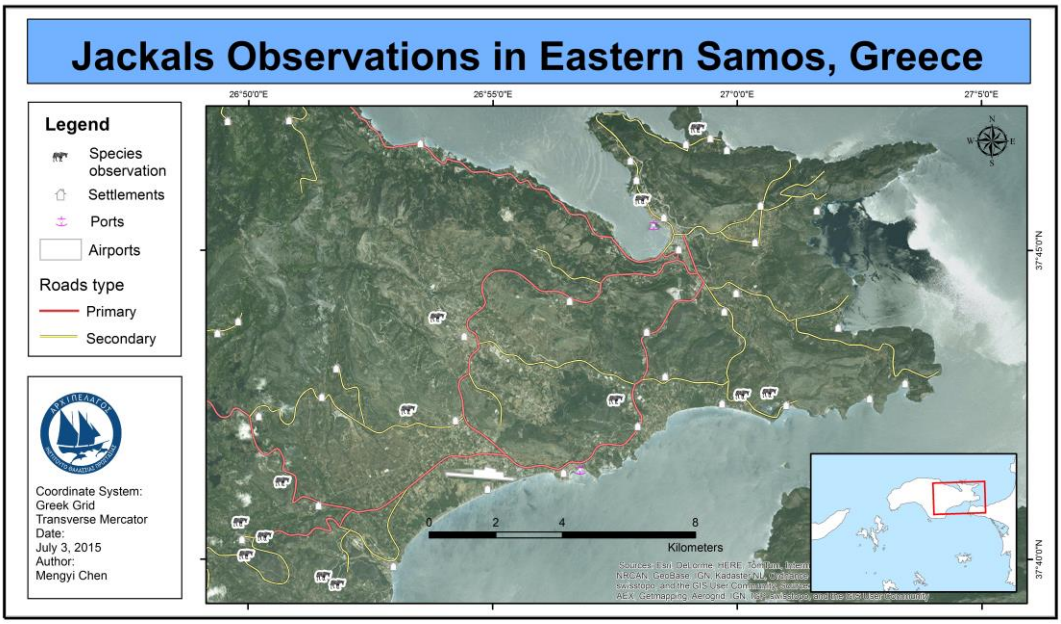

Figure 1. Jackal observation map

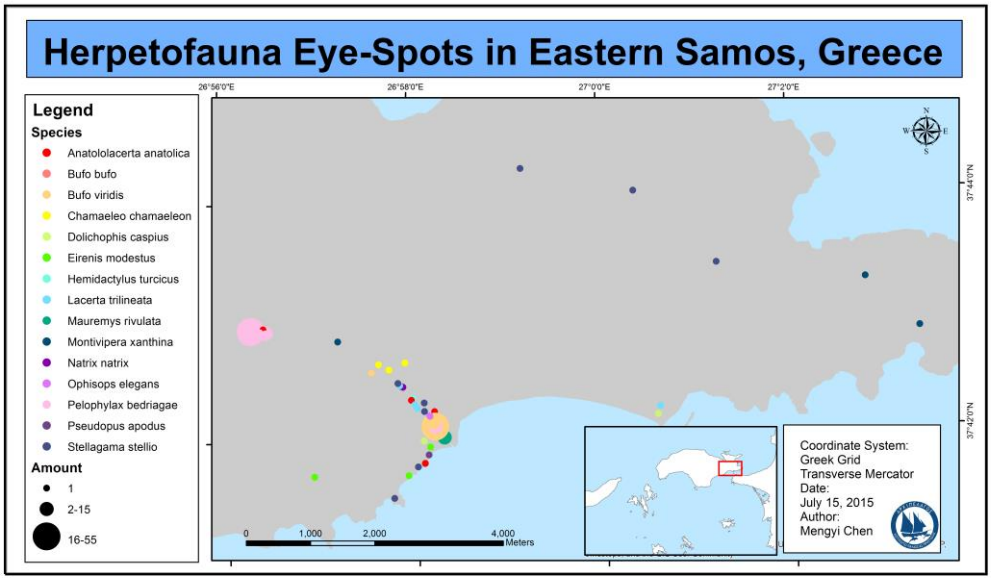

Figure 2 Herpetofauna eye-spots map

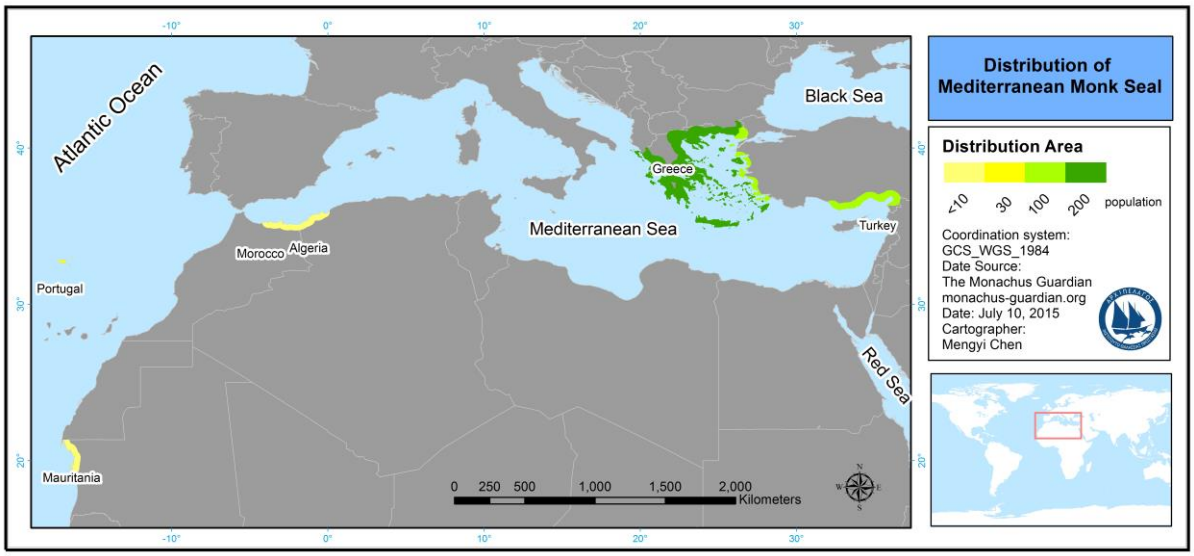

Figure 3. Monk seal distribution map

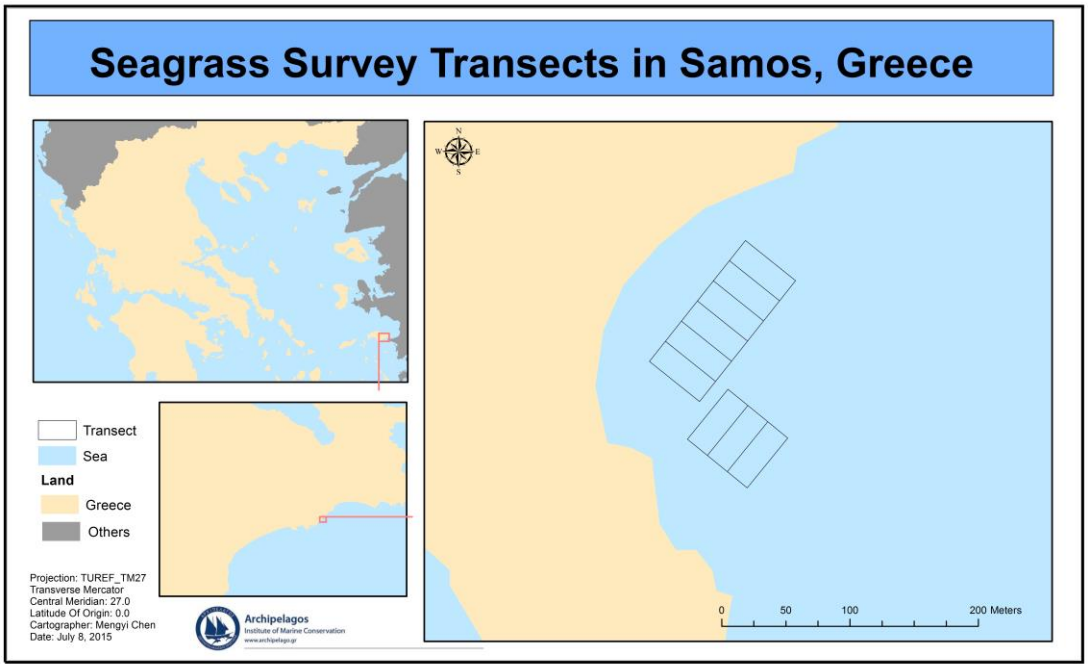

Figure 4 Seagrass Survey Transects map

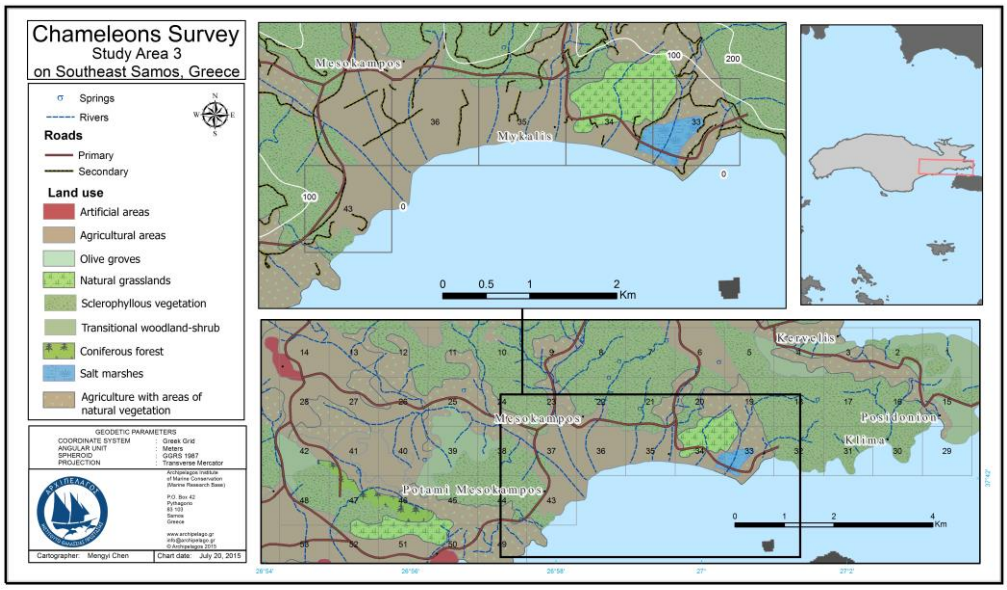

Figure 5 Chameleons survey map

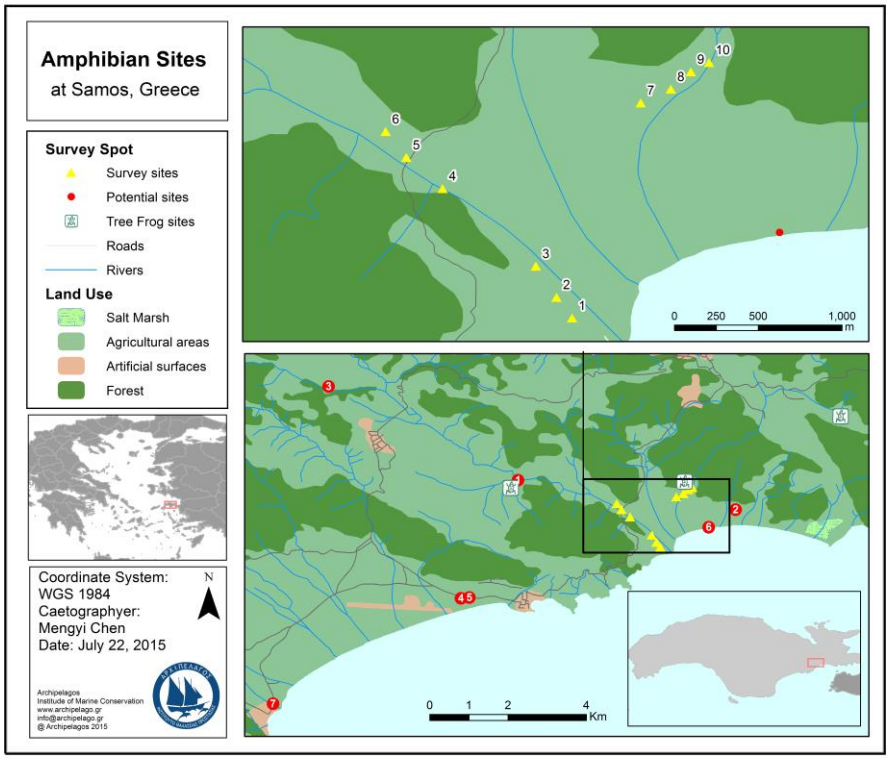

Figure 6. Amphibian survey map