

UC San Diego

Capstone Projects

Title

Risk Perception and Community Action: Assessing Risk Perception of Climate Change Impacts in Trinidad and Tobago Through Time

Permalink

<https://escholarship.org/uc/item/19z7r8v5>

Author

Goin, Elyse

Publication Date

2021-06-01

Risk Perception and Community Action: Assessing Risk Perception of Climate Change Impacts in Trinidad and Tobago Through Time

Elyse Goin

Master of Advanced Studies

Marine Biodiversity and Conservation

Scripps Institution of Oceanography, UC San Diego



Capstone Advisory Committee:

Dr. Isabel Rivera-Collazo, Scripps Institution of Oceanography and UC San Diego

Mr. Ernie Brazier, CIC Research Inc.

Mr. Carver Bacchus, Sustain T&T

This report is a result of a Capstone Project by:
Elyse Goin
Master of Advanced Studies
Marine Biodiversity and Conservation
Scripps Institution of Oceanography, UC San Diego
egoin@ucsd.edu

Capstone Advisory Committee:
Dr. Isabel Rivera-Collazo, Committee Chair
Scripps Institution of Oceanography and UC San Diego Anthropology



Date: Jun 14, 2021

Mr. Ernie Brazier, Committee Member
CIC Research Inc.



[Ernest Brazier \(Jun 10, 2021 14:06 PDT\)](#)

Date: Jun 10, 2021

Mr. Carver Bacchus, Committee Member
Sustain T&T



Date: Jun 7, 2021

Abstract

Trinidad and Tobago, as a small island nation in the Caribbean is experiencing climate change impacts. A qualitative survey was created and administered to environmental organizations, government entities, and an academic institution in the island of Trinidad. The results were compiled visually into an ArcGIS Story Map and is available through the Human Ecology Laboratory at UC San Diego's website. The purpose of this study is to hear directly from community members who are experiencing climate impacts on the island of Trinidad to understand the level of risk associated with those impacts. There is a need for more community organized environmental groups to lead others towards proactive behaviors following a climate event. This is essential in protecting livelihood. This document provides the complete process leading up to the creation of the Story Map.

Introduction

Trinidad and Tobago, a small island developing state (SIDS)¹ home to over 1.3 million people², is located in the Southern Caribbean Sea.³ It encompasses just over 5.1 thousand km² and includes mountain ranges, wetlands, mangrove forests, swamps, and corals in the Buccoo Reef flanking the southwest coast of Tobago.⁴

Climate change is a global occurrence where the burning of fossil fuels for energy produces greenhouse gases that inhibit Earth's atmosphere causing warming events.⁵ These warming events slowly change the climate of every region of the planet, however Trinidad and Tobago as a SIDS, shoulders a more acute effect than larger land masses. SIDS bear higher pressure in the face of climate impacts due to their smaller area, particular locations and exposure to other natural disasters.⁶ Climate events not only cause damage to the environment, but also to humans. Community members have first-hand knowledge of the type of damage these events have caused and can use that knowledge to share with the rest of the region.⁷

Map of Trinidad and Tobago⁸



Background and Problem Statement

Climate change is affecting island nations at a faster rate than other places in the world.⁹ Due to this global climate phenomenon, coastal island communities find themselves facing a climate emergency head on.¹⁰ A climate impact is something that occurs as a result of climate change. Climate impacts can affect household livelihood security or “adequate and sustainable access to income and resources to meet basic needs.” (Frankenberger and McCaston, 1998)¹¹ Hazards that directly affect shelter or physical environment challenge human habitat security¹² and community values. When there are impending threats to things that people value, those threats become a risk to that community, culture, or way of life.¹³ Understanding how people perceive climate related endangerments can further explain tactics towards group resiliency following a hazardous event. Risk perception of a threat directly relates to adaptive capacity.¹⁴ Adaptive capacity is associated with exposure and sensitivity. The adaptation methods that a threatened community can execute is linked to exposure to the climate risk and sensitivity of the people or locations.¹⁵ Therefore, the adaptive capacity of a specific community is the likelihood of adjusting to normalcy following the introduction of a climate event, given a predetermined access to resources.¹⁶ Once a risk has been identified, adaptation can begin¹⁷ to increase the possibility of habitat and livelihood security. Identifying risks reveals vulnerability and resilience to climate impacts.¹⁸

The island of Trinidad has experienced specific climate impacts and its coastal communities have knowledge that can help spread wisdom about resilience.¹⁹ The most prevalent climate impacts that the island of Trinidad faces are sea level rise, flooding, and coastal erosion.^{20, 21, 22} Given this information, the researchers of this study ponder the state of societal vulnerability along the Northern half of Trinidadian coasts. The research questions are: how do coastal communities feel about the impacts from climate change and do coastal communities perceive these impacts as a risk to their livelihood? This study is significant to facilitate understanding of human responses to climate events in regions that have pre-existing knowledge. People notice things and act to the best of their abilities and these actions could be useful in other communities, towns or coastal nations. The outcomes of this study can influence local policy-making bodies in their decisions about future risk mitigation. They need to understand the people they are protecting.

Methods

The study involves two methods of research to recognize community member’s perspectives and to showcase results and findings in an interactive manner.

1. Community Based Participatory Research method: Survey
2. Dissemination and compilation of results: Story Map

Survey Procedures | A survey was utilized to understand an individual’s thoughts, experiences, and feelings towards risks from climate impacts. A questionnaire was first drafted in Microsoft Word to allow for all possible queries and to define a proper flow of questions. The final selected questions were transferred to Qualtrics, an online program that allows for simple and effective survey creation, dissemination, and data results collection. Brand account access to Qualtrics was

acquired by UC San Diego IT services to allow for uninhibited use of survey creation. The final survey was submitted to the UC San Diego Human Research Protections Program and was approved for International Review Board Exemption status. See Appendix for IRB exemption certificate and for a copy of the final survey.

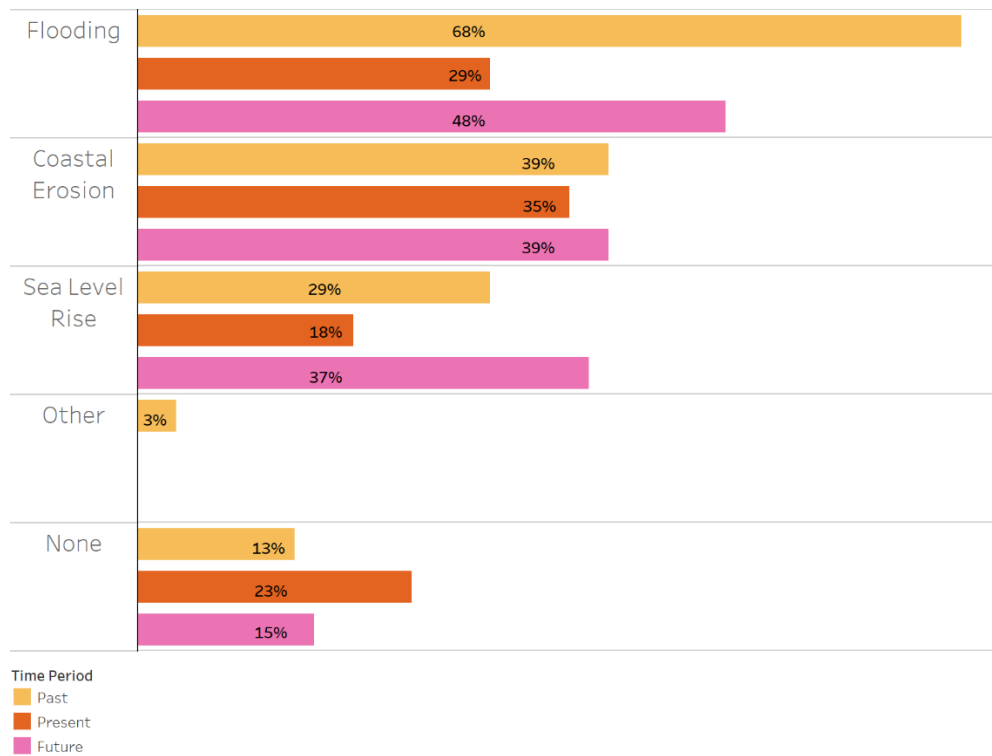
The survey was sent via an email link to individuals in the island of Trinidad who were (1) associated with an environmental organization, (2) colleagues or students of professors at the University of the West Indies- St. Augustine Campus, or (3) colleagues of individuals at the Institute of Marine Affairs in Trinidad and Tobago. For the full list of organizations who had access to the final survey see the Appendix. The target population were people who lived in the island of Trinidad, interacted with the coastline, had internet access and a device for accessing the internet, and could be contacted by email by one of the partner organizations or individuals who had agreed to participate in this study. The survey link was live for 3.5 weeks, from March 24th- April 17th, 2021. Consent was obtained by each respondent prior to taking the survey and no personal identifying information was acquired, maintaining complete anonymity.

Results

A total of 538 individuals received an email link for the survey. This number is a close estimation due to the dissemination method. There was crossover from some groups receiving an email link from multiple sources who sent the survey to others within their social and professional circles. A total of 77 individuals opened and started the survey, 65 provided a response, and 43 completed the entire survey. There were 12 incomplete responses out of 77 that were unusable and removed from the final study. There were 22 partial responses out of 65 that were still usable and included in the final study results. In the end there were 65 responses used and incorporated in the results of the study or approximately 12% response rate.

Data Analysis | All results from the survey were automatically recorded on Qualtrics, where they were exported to Microsoft Excel and IBM Statistical Package for the Social Sciences (SPSS) for further analysis. Microsoft Excel provided an arena for preliminary data computing and an easier avenue for coding open-ended question responses. Access to SPSS was acquired through UC San Diego IT Services. SPSS provided higher level data computing, graph creation, and evaluation of recoded free-response questions. After all of the data was thoroughly analyzed, the portions of the data which were going to be used in the Story Map were transferred to Tableau, a software used to create visually stimulating charts and graphs. In Tableau, the specific charts portrayed in the Story Map were color coded to match the maps created in ArcGIS for fluidity. The survey results for climate impacts in the different time periods is presented in Figure 1.

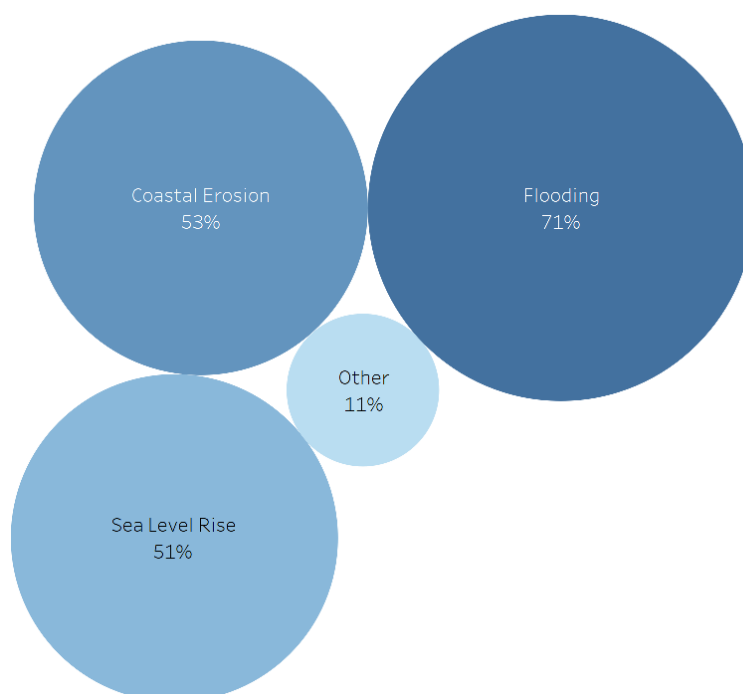
Fig1| Climate Impacts by Time Period



The chart displays results from the Trinidad Coastal Community survey question 10. The past, present, and expected future climate impacts for flooding, coastal erosion, sea level rise, other climate impacts and no climate impacts are shown. The yellow bar is the past, the orange bar is the present, and the pink bar is the future. The total number of respondents is 62 and there is overlap in percentages as this was a multiple response question.

The data revealed that flooding was the most past observed or future expected climate impact at various locations throughout Trinidad. 68% of the survey respondents stated that there had been flooding in the past and 48% of survey respondents expect future flooding impacts. Sea level rise received the overall lowest responses from the survey respondents in all three time periods, past observations, present observation, and future expectations. In general, the survey respondents failed to see present climate impacts in the island of Trinidad, with 23% of them stating that they are not seeing any impacts currently. However, the survey data presents that people have observed climate impacts and expect them to continue in the future.

Fig 2| Risk Perception of Climate Impacts



The graphic in Figure 2 portrays the risk perception results from the Trinidad Coastal Community survey question 14. Total responses are 45 and there is overlap in percentages as this was a multiple response question. Survey respondents were asked to identify if the climate impacts listed were hazards or risks to their livelihood. 71% of them identified flooding as a risk, 53% identified coastal erosion as a risk and 51% identified sea level rise as a risk. 11% of people stated that a grouping of other climate impacts posed risks. Examples of the other climate impacts include: heatwaves, ocean acidification, severe dry seasons, and toxicological pollutants.

Comparing the results from survey question 10 (Fig 1) and survey question 14 (Fig 2) depicts an increase in the number of individuals who identified climate impacts as risks. 48% more individuals classified sea level rise as a risk rather than as a past climate impact. 31% more individuals classified coastal erosion as a risk. The differences in flooding classification are less pronounced due to the large amount of survey respondents who already identified it as a past climate impact. There was a 6% increase in individuals who classified flooding as a risk rather than as a climate impact. This data explains the risk perceptions of the survey respondents.

Story Map

Government Data | An ArcGIS Story Map was created to allow for elegant storytelling of the survey data and to provide an interactive journey for varying audiences. Visitors to the Story Map are able to follow the storyline laid out or pick their own path and learn about specific

segments of the study. Maps of the island of Trinidad were first created in the ArcGIS Pro Desktop software. Access to this software and the online program platform were acquired via UC San Diego. Twelve datasets for the island of Trinidad were obtained from the Institute of Marine Affairs of Trinidad and Tobago (IMA), a government sector. A letter of data submission from the Director of the IMA is in the Appendix. The data sets contained information concerning: coastal changes, flooding, coastal geomorphology, bathymetry and shoreline types from the year 1994 to the year 2014 collected by the IMA. These datasets provided specific geospatial information about the changes observed by the IMA. The six data sets from the IMA used in the final product were: coastline 1994, coastline 2007, coastline 2014, coastal changes 2011-2015, coastal changes 2004-2008, and coastal changes 1994-2007.

Digitized Survey Data | Once the map included all of the government provided data layers, the survey results provided a fresh set of data layers of observed and expected climate impacts, and locations of perceived risks from the survey respondent's perspectives. The surveyor's location responses to questions 11, 12, 13 and 14 were utilized for the new data layers. The response locations for past impact, present impact, expected future impact, and risk perceptions were digitized as new data points on the existing map. The methods to create new digitized points utilized Google Maps online software and ArcGIS Pro Desktop software. Survey responses contained names of general locations where a climate impact (past, present, expected future) or perceived risk is located and four new digitized data layers, one for each feature, were created and overlaid on the map. Following that, 5-kilometer buffers were created to surround each newly created data point to allow for over generalization on the respondent or researcher's behalf. A few of the survey responses included oversimplified regions that spanned a larger area than a single point, therefore the circular buffered region surrounding each point accounted for this expanse. Any buffered regions that extended into the ocean and off of the land mass was cut using the reshape tool to adhere to the shape of the island. This final map was uploaded to ArcGIS Online under the title Climate Hazard Perception.

Story Map Build | The Story Map was created using the online platform ArcGIS Story Maps. It includes direct quotes from the survey data, the designed map with selected dataset layers visible, the charts crafted from Tableau, and photos and videos from Trinidadian videographer Juliette McCawley. The official Story Map can be viewed from the Human Ecology Laboratory at UC San Diego's website at <https://humanecology.ucsd.edu/risk-perception-and-community-action/or> at this direct link on ArcGIS Story Maps: <https://arcg.is/1XnPq50>.

Future Prospects

This project is only a beginning. There is a need for more research into the types of climate impacts different community members on different islands perceive as risks. This study encompassed a subset of community members focused on the Northern portion of the island of Trinidad, however with a larger survey population and inclusion of people on the island of Tobago, more conclusions can be made. The results of this study answered the question regarding if coastal communities perceive climate impacts as risks to their livelihood, they do perceive the impacts as risks. However, this study could not fully answer how these communities feel about the impacts from climate change. There is a necessity to listen to and document the

knowledge coming from within communities. This study was restrained due to the coronavirus pandemic, but in the future a short film interviewing community members will provide more insight into survey results while connecting to real people. Lastly, more inclusion from the government sector will help to bridge the gap between officeholders, scientists, and the community to inspire more positive action.

Acknowledgements

This project was made possible with the support of my Capstone Advisory Committee, the Trini scientists, professors, conservationists and students, Emily Zou, my family, and my fiancé. Thank you for your patience and guidance.

References

-
- ¹ “Health and Climate Change: Country Profile 2020: Trinidad and Tobago.” n.d. Accessed February 21, 2021. <https://www.who.int/publications-detail-redirect/health-and-climate-change-country-profile-2020-trinidad-and-tobago>.
 - ² “Core Statistics.” 2021. *Central Statistical Office*. Accessed June 4, 2021. <https://cso.gov.tt/>
 - ³ “Maps of Trinidad and Tobago.” Feb 25, 2021. *World Atlas*. Accessed June 4, 2021. <https://www.worldatlas.com/maps/trinidad-and-tobago>.
 - ⁴ “Maps of Trinidad and Tobago.”
 - ⁵ “Hazards.” 2013. *Office of Disaster Preparedness and Management*. Accessed June 4, 2021. <http://www.odpm.gov.tt/node/24>.
 - ⁶ “Health and Climate Change: Country Profile 2020: Trinidad and Tobago.”
 - ⁷ Thomas, Kimberley, R. Dean Hardy, Heather Lazrus, Michael Mendez, Ben Orlove, Isabel Rivera-Collazo, J. Timmons Roberts, Marcy Rockman, Benjamin P. Warner, and Robert Winthrop. 2019. “Explaining Differential Vulnerability to Climate Change: A Social Science Review.” *WIREs Climate Change* 10 (2): e565. <https://doi.org/10.1002/wcc.565>.
 - ⁸ Esri. “World Imagery” [basemap]. Scale Not Given. “Imagery with Labels”. <https://ucsdonline.maps.arcgis.com/apps/mapviewer/index.html?webmap=760661f4fe9948f1b91c8779c0d97db3>. (June 4, 2021).
 - ⁹ Rivera-Collazo, Isabel, Cristina Rodriguez, and Jose Garay-Vazquez. 2017. “A Deep-Time Socioecosystem Framework to Understand Social Vulnerability on a Tropical Island.” *Environmental Archaeology* 23 (June): 1–12. <https://doi.org/10.1080/14614103.2017.1342397>.
 - ¹⁰ Rivera-Collazo, Rodriguez, and Garay-Vazquez. “Deep-Time Socioecosystem Framework.”
 - ¹¹ Frankenberger, Timothy R., and M. Katherine McCaston. “The household livelihood security concept.” *Food Nutrition and agriculture* (1998): 30-35.
 - ¹² Frankenberger and McCaston. “Household livelihood.”
 - ¹³ Pidgeon, Nick. 1998. “Risk Assessment, Risk Values and the Social Science Programme: Why We Do Need Risk Perception Research.” *Reliability Engineering & System Safety*, Risk Perception Versus Risk Analysis, 59 (1): 5–15. [https://doi.org/10.1016/S0951-8320\(97\)00114-2](https://doi.org/10.1016/S0951-8320(97)00114-2).
 - ¹⁴ Isabel Rivera-Collazo, pers. comm. February 18, 2021.
 - ¹⁵ Thomas at al. “Differential Vulnerability.”
 - ¹⁶ Thomas at al. “Differential Vulnerability.”

¹⁷ Isabel Rivera-Collazo, pers, comm, February 18, 2021.

¹⁸ Thomas et al. "Differential Vulnerability."

¹⁹ Carlos Fuller, Hannah Elisabeth Kurnoth, and Beatrice Mosello. 2020. "Climate-Fragility Risk Brief: The Caribbean." Climate Security Expert Network. Accessed February 20, 2021. https://climate-security-expert-network.org/sites/climate-security-expert-network.org/files/documents/csen_caribbean_riskbrief.pdf.

²⁰ Fuller, Kurnoth, and Mosello. "Climate-Fragility Risk Brief."

²¹ "Flooding." n.d. *Trinidad and Tobago Weather Center* (blog). Accessed February 20, 2021. <https://ttweathercenter.com/severe-weather/flooding/>.

²² "Health and Climate Change: Country Profile 2020: Trinidad and Tobago."

Appendix

Organizations who received the survey link

- The Institute of Marine Affairs
- Nature Seekers
- Sustain T&T
- Sky Eco-Development
- SpeSeas
- The University of the West Indies-St. Augustine Campus
- TT Field Naturalist Club
- Fishermen and Friends of the Sea
- The Cropper Foundation
- Council of Presidents of the Environment
- Future Fishers
- Grande Riviere Nature Tour Guides Association
- Save our Sea Turtles- Tobago
- Coastal Dynamics Limited

210279



UNIVERSITY OF CALIFORNIA, SAN DIEGO
HUMAN RESEARCH PROTECTIONS PROGRAM

TO: Ms. Elyse Goin
RE: Project #210279 Risk Due to Climate Change in Trinidad and Tobago

Dear Ms. Goin:

Your project has been reviewed by an IRB Chair and/or the IRB Chair's designee and certified as exempt from IRB review under 45 CFR 46.104(d), category 2: Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:

- (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;
- (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or
- (iii) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects, and an IRB conducts a limited IRB review to make the determination required by §46.111(a)(7).

Please note: When a study has been certified as exempt from IRB review, continuing review and approval is not required. Certification of Exemption is effective for the life of the study. However, all modifications to a study that has been certified exempt must be submitted to the IRB for prospective review and certification of exemption prior to implementation. In some circumstances, changes to the protocol may disqualify the project from exempt status.

The research activities described in the application have been determined to meet the criteria for exemption from IRB review. The PI should ensure that the research activities are conducted in compliance with applicable UCSD and Rady Children's Hospital – San Diego policies and ethical standards as well as local, state, and federal regulations.

On behalf of the UCSD Institutional Review Boards,

A handwritten signature in black ink, appearing to read "Kip Kantelo".

/la

Kip Kantelo
Director
UCSD Human Research Protections Program
858-246-HRPP (858-246-4777); hrpp@ucsd.edu

Release date: 3/22/2021



**INSTITUTE OF
MARINE AFFAIRS**

A Statutory Body established by Act of Parliament, No. 15 of 1976

12th April 2021

Ms. Elyse Goin
Candidate in Master of Science for
Marine Biodiversity and Conservation
Scripps Institution of Oceanography
9500 Gilman Drive, 0515
La Jolla, California 92093-0515

Dear Ms. Goin

SUBMISSION OF DATA FOR MS. C STUDENT – MS. ELYSE GOIN

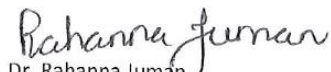
The Institute of Marine Affairs (IMA) received the official signed off copy of the IMA Data licence on 7th April 2021. We would also email your supervisor, Assistant Professor Isabel Rivera-Coolazo at iriveracollazo@ucsd.edu on this correspondence.

Please find the available 12 IMA data sets listed below as well as your copy of the IMA Data Licence with stipulated provisions:

199908_GOP_UKHO_pWGS84_bathymetric_point_measurements_in_the_Gulf_of_Paria.shp
200306_EaCo_UKHO_pWGS84_bathymetric_points_off_east_coast_of_Trinidad_and_Tobago.shp
200603_TT_WRI_pWGS84_smaller_area_bathymetry_for_Trinidad_and_Tobago_exclusive_economic_zone.shp
201006_Trini_IMA_pNap55_coastal_process_change_of_bays_in_Trinidad_2004_to_2008.shp
201006_Trini_IMA_pNap55_coastal_process_change_of_bays_in_Trinidad_2011_to_2015.shp
201108_Trin_IMA_pWGS84_coastal_geomorphology_of_Trinidad.shp
201204_TT_IMA_pWGS84_1994_coastline_of_Trinidad_and_Tobago.shp
201204_TT_IMA_pWGS84_2007_coastline_of_Trinidad_and_Tobago.shp
201805_TT_IMA_pWGS84_coastal_vegetation_line_erosion_and_accretion_in_TandT_1994_to_2007.shp
201807_TT_IMA_pWGS84_2014_coastline_of_Trinidad_and_Tobago.shp
201907_Trin_IMA_pWGS84_2014_coastline_environmental_vulnerability_index_Trinidad.shp
201907_Trin_IMA_pWGS84_2014_coastline_type_for_Trinidad.shp

Should you require any clarification or further information, kindly contact the Mr. Lester W. Doodnath at 634-4291 ext 2158 or at lwdoonath@ima.gov.tt

Yours respectfully,


Dr. Rahanna Juman
Director (Ag.)

Hilltop Lane, Chaguaramas
P.O. Box 3160, Carenage Post Office
Trinidad & Tobago, West Indies
Tel: (868) 634 4291/4 | Fax: (868) 634 4433 | www.ima.gov.tt | director@ima.gov.tt

Trinidad Coastal Community Survey

Q1

Welcome to the Trinidad Coastal Community Survey!

Please take a moment to review the [consent form](#). When you are ready to begin the survey, select "Yes, I consent," indicating that you have read and understand the terms of the survey's consent form and that you are at least 18 years old.

- Yes, I consent
- No, I do not consent or I am not 18 years old
-

Q2

This survey should take no more than 15 minutes to complete and all responses will be kept confidential. In answering each question, your response should reflect how you would normally act, before the pandemic.

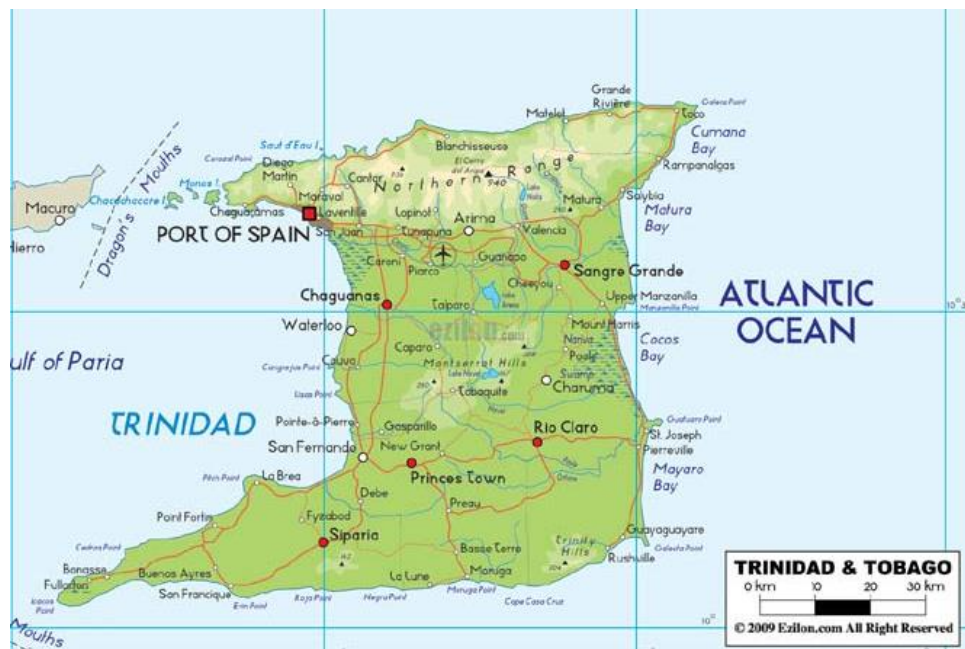
If you have any additional information or questions about this survey, please contact the Principal Investigator Elyse Goin at egoin@ucsd.edu.

Thank you very much for your help!

Q3 Have you or do you currently live on coastal areas on the northern half of the island (any coastal regions between Port of Spain and Manzanilla)?

- Yes
 - Not Sure
 - No
-

Q4 Select which area you are located in on the island of Trinidad? Use your best guess to click an area close to the location.



Q5 What type of activities do you normally do when visiting the coast or beach? Select all that apply to you. Select "I do not visit" if you do not visit the coast or beach.

- Watersports (examples: swimming, surfing, diving, snorkeling, jet ski, etc.)
- Fishing
- Sightseeing/Walking
- Boating/Sailing (examples: kayaking, canoeing, sailing for leisure, etc.)
- Relaxing (examples: laying down, listening to music, talking to friends, eating and drinking, etc.)
- Sand sports (examples: volleyball, tennis, frisbee, etc.)
- Learning and exploring (examples: collecting shells, tide pooling, photography, painting or drawing, etc.)
- Other Please specify. _____
- I do not visit

Q6

The rest of the survey asks about three specific climate impacts. Please keep in mind that:

Flooding is water that temporarily covers land that is normally dry.

Coastal Erosion is the loss of land, sediment, or rocks along the coastline.

Sea level rise is the increase in the level of the ocean.

Carry Forward Selected Choices - Entered Text from "Q5"

Q7 Currently, does flooding, coastal erosion, or sea level rise threaten your activities? Select all that apply.

- No, none of them
- Not sure
- Watersports (examples: swimming, surfing, diving, snorkeling, jet ski, etc.)
- Fishing
- Sightseeing/Walking
- Boating/Sailing (examples: kayaking, canoeing, sailing for leisure, etc.)
- Relaxing (examples: laying down, listening to music, talking to friends, eating and drinking, etc.)
- Sand sports (examples: volleyball, tennis, frisbee, etc.)
- Learning and exploring (examples: collecting shells, tide pooling, photography, painting or drawing, etc.)
- Other Please specify.
- I do not visit

Display This Question:

If Q7 = No, none of them

Or Q7 = Not sure

Q8 In the future, will flooding, coastal erosion, or sea level rise ever threaten the activities that you do at the coast or beach? Select one answer below.

- Yes, next year
- Yes, in the next 5 years
- Yes, in the next 10 years
- Yes, at some point in the future
- No, never
- Not sure

Q9

The next section asks questions about hazards and risks. Please answer to the best of your ability keeping in mind that:

Community area is the physical space surrounding your home, neighborhood or where your activities are located.

Q10 For each statement below, **select** the climate impacts that you have seen, currently see, or expect to see. Select all climate impacts that apply. If none of the climate impacts answers the statement, then choose "None of these".

If there is something else that better answers or helps to answer the statements, then please write it in the "Other" text box.

--	--	--	--	--	--

	Flooding	Coastal Erosion	Sea Level Rise	Other	None of These
I have seen this in my community region in the past (over a year ago)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
I am currently seeing this in my community region (2021)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
I expect to see this in my community region in the future (over a year from now)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>

Display This Question:

*If Q10#1 = I have seen this in my community region in the past (over a year ago) [Coastal Erosion]
 Or Q10#2 = I have seen this in my community region in the past (over a year ago) [Sea Level Rise]
 Or Q10#5 = I have seen this in my community region in the past (over a year ago) [Flooding]
 Or For each statement below, select the climate impacts that you have seen, currently see, or expect... I have seen this in my community region in the past (over a year ago) - Other Is Not Empty*

Q11, You said that you have seen climate impacts in your community area in the past. Please specify which climate impact and explain when and where you saw them.

Display This Question:

If Q10#1 = I am currently seeing this in my community region (2021) [Coastal Erosion]

Or Q10#2 = I am currently seeing this in my community region (2021) [Sea Level Rise]

Or Q10#5 = I am currently seeing this in my community region (2021) [Flooding]

Or For each statement below, select the climate impacts that you have seen, currently see, or expect... I am currently seeing this in my community region (2021) - Other Is Not Empty

Q12, You said that you are currently seeing climate impacts in your community area. Please specify which climate impact and explain where you see them.

Display This Question:

If Q10#1 = I expect to see this in my community region in the future (over a year from now) [Coastal Erosion]

Or Q10#2 = I expect to see this in my community region in the future (over a year from now) [Sea Level Rise]

Or Q10#5 = I expect to see this in my community region in the future (over a year from now) [Flooding]

Or For each statement below, select the climate impacts that you have seen, currently see, or expect... I expect to see this in my community region in the future (over a year from now - Other Is Not Empty

Q13, You said that you expect to see climate impacts in your community area. Please specify which climate impact and explain when, where, and why you chose your answer.

Q14, Do you perceive the following climate impacts to be a hazard to yourself or your community area? Select the appropriate response for all of the climate impacts. Explain why and specify the location. If

there is a different climate impact that you perceive to be hazardous, then please write it in the "Other" text box and answer the following questions.

	Yes, this is a hazard.	Maybe, this may be a hazard.	No, this is not a hazard.	I chose this because...	Location of this hazard
Flooding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sea Level Rise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Q15

This section involves questions about your actions and responses. Please answer to the best of your

ability keeping in mind that:

Community area is the physical space surrounding your home, neighborhood or where your activities are located.

Community group includes your neighbors, members of your organization, local friend group or others who may be located within your same community.

Q16 Please rank the following three (3) events in terms of their immediate hazard to your community region where, 1 is MOST and 3 is LEAST hazardous to your community region. Drag and drop the responses in your desired order.

- _____ Flooding
 - _____ Coastal Erosion
 - _____ Sea Level Rise
-

Display This Question:

If Q16 [Flooding] = 1

Q17 What do you do when it floods in your community? Describe what **actions** you or your community group performed, if any, and the immediate **outcome** of those actions, if known.

Display This Question:

If Q16 [Coastal Erosion] = 1

Q18 What do you do when the coast begins to erode? Describe what **actions** you or your community group performed, if any, and the immediate **outcome** of those actions, if known.

Display This Question:

If Q16 [Sea Level Rise] = 1

Q19 What do you do when the sea level begins to rise? Describe what **actions** you or your community group performed, if any, and the immediate **outcome** of those actions, if known.

Q20

These next questions are included to better analyze the results of the survey. Please respond as honestly as possible.

Q21 How long have you lived on the island of Trinidad in **years**? If less than 1 year, type "0"

Q22 If you received this survey through your community-based organization, how long have you been involved with that organization in **years**? If less than 1 year, type "0"

Q23 Select your age range from the dropdown list.

- 18 - 30
 - 31-50
 - 51-60
 - 61-75
 - 76 or older
 - I prefer not to answer
-

Q24 How long have you or your family lived on a coastal area on the northern half of Trinidad? Select all answers that apply below. If you or your family have never lived by the coast, then select "Never lived by the coast."

- I am the first of my family to live by the coast
 - My parent(s) were of the first of my family to live by the coast
 - My grandparent(s) were of the first of my family to live by the coast
 - My great-grandparent(s) were of the first of my family to live by the coast
 - We have always been here
 - Not sure
 - Never lived by the coast
 - I prefer not to answer
-

Q25 Select your highest level of education that you have received from the dropdown list.

- Less than high school
 - High school graduate
 - Some college
 - Associate or Bachelor's degree
 - Graduate degree
-

Q26 If you would like to be notified of the written results of this study and/or a private showing of the researcher's Capstone Project, please click an option below.

- Written results of this study
- Private Showing of the researcher's Capstone Project