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### The Threats of Sea Level Rise: An Eco-Geopolitical Visual Analysis

Jorge L. Nowell-Enriquez

*The Graduate Center, City University of New York*

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THE THREATS OF SEA LEVEL RISE:  
AN ECO-GEOPOLITICAL VISUAL ANALYSIS

by

JORGE LUIS NOWELL-ENRIQUEZ

A master's capstone project submitted to the Graduate Faculty in Liberal Studies in  
partial fulfillment of the requirements for the degree of Master of Arts,

The City University of New York

2018

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The Threats of Sea Level Rise: An Eco-Geopolitical Visual Analysis

by

Jorge L. Nowell

This manuscript has been read and accepted for the Graduate Faculty in Liberal Studies in satisfaction of the capstone project requirement for the degree of Master of Arts.

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Date

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Wendy Luttrell  
Capstone Project Advisor

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Date

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THE CITY UNIVERSITY OF NEW YORK

## ABSTRACT

The Threats of Sea Level Rise: An Eco-Geopolitical Visual Analysis

By

Jorge Nowell-Enriquez

Advisor: Wendy Luttrell

This eco-geopolitical research produces information about the sea level rising, and the analyst explains and projects global effects, and further problems and consequences of the phenomena in a five-minute-long video clip.

The focus is coastlines floods as a consequence of the sea level rising produced by glaciers melting. The floods will affect regions where over a billion persons are living, mainly coastal cities. Therefore, the sea level rising will produce or ease gradual destruction and sudden catastrophes. Moreover, these catastrophes will spur mass migration that might change the lives of a billion persons by 2045.

This project applied the academic skills acquired studying an individualized track of theoretical courses on International Relations, different courses on International Security Studies, and The Political Ecology of Social and Environmental Justice. The final products are, in addition to the video (<https://vimeo.com/user68406434/sealevelrise>) this thirty-four pages white paper, the publication of a web place using SCALAR, the open source platform provided by The Alliance for Networking Visual Culture, and it includes the uploading of written material and a

link to the video made with digital visuals such as video captures from internet, photos, and my own artistic production (<http://scalar.usc.edu/works/the-threats-of-sea-level-rise-an-eco-geopolitical-visual-analysis-/index>). I applied my artistic and technological skills to deliver a description and an explication in digital form under guidance and advice of Professor Luttrell. Therefore, this video explains the destruction of productive infrastructure, housing, natural habitats, and ecosystems by sea level rise. It also explains the surge of mass migration with social, political, and economic consequences at local, national and global levels. These catastrophes will affect big cities around the world and will challenge local and national governments. Thus, this project is a professional eco-geopolitical analysis presented visually.

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Video

**[The Threats of Sea Level Rise](#)** A master's capstone project submitted to the Graduate Faculty in Liberal studies in partial fulfillment of the requirements for the degree of Master of Arts, The city University of New York by Jorge L Nowell-Enriquez.

**Date:** 2018-09-09

Web Page

**[The Threats of Sea Level Rise: An Eco-Geopolitical Visual Analysis](#)** a digital copy of the white paper submitted to fulfil the requirements for the Master of Arts of the Graduate Center, City University of New York by Jorge Nowell-Enriquez published on *SCALAR*, the open source platform provided by The Alliance for Networking Visual Culture.

**Date:** 2018-06-15

## INTRODUCTION

This white paper is submitted to fulfill the requirements for the Master of Arts of the Graduate Center, City University of New York. This requirement accompanies the video production “Threats of Sea Level Rise.” The initial project underwent several modifications, specifically its duration; the goal was create a video of five minutes to keep viewer interest. This project is prepared with the advice of Professor Wendy Luttrell. Indeed, her experience doing and advising visual research was a great help to me. Thus, this white paper describes the process of research, production, and the challenges faced to do a video as scholarship.

The transformation of knowledge into visuals relies on academic capacity, technical skills, and aesthetic choices. I hope this visual presentation about sea level rise can represent my academic capacity as a product of my studies at The Graduate Center, but also on the whole CUNY system, because I started to study in BMCC, got a B.A. in City College, and I am proudly presenting the requirements of The Graduate Center to get a Master of Arts. As an ESL student and coming from Guatemala, a country constantly having natural disasters, natural catastrophes are part of my ethos. This academic project allows me to show my multidisciplinary grasp of the ecological and geopolitical issues that are the subject of study of my individualized track. This white paper follows the format already established by the Master of Arts in Liberal Studies program (MALS).



## METHODOLOGY

This project is based on scholarly research from primary sources such as NASA and NOAA researches, data, and imagery; and from international institutions researching the sea level rise. Also, I researched secondary sources such as specialized publications <sup>1</sup>. In addition, the final product includes images collected and re-purposed from internet and social media open sources. The final product is the result of the interdisciplinary interaction of the graduate studies including scholarship of the application of early cinema theory all bounded with the visual methodology I was exposed to in the course Doing Visuals & Arts Based Research.

## NARRATIVE DESCRIPTION

### Description of the Project

#### The Process of Development:

It is challenging to represent visually the great amount of academic production and the always growing scholarship uploaded to the World Wide Web. Indeed, this visual production describing climate change represents a way of culling through information and images on the

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<sup>1</sup> Scienedirect.com provides access to several specialized journals, the most useful was Weather and Climate Extremes (<https://www.journals.elsevier.com/weather-and-climate-extremes>). The web site archive.com is good directory of blogs and websites dealing with sea level rise ([https://web.archive.org/web/\\*/sea%20level%20rise](https://web.archive.org/web/*/sea%20level%20rise)). Nature.com lists articles and videos in journals dedicated to scientific aspects of sea level rise (<https://www.nature.com/search?order=relevance&q=sea%20level%20rise%20videos>)

internet and using digital technology to piece together a visual narrative about sea level rise and its consequences.

#### Video Processing Scholarship:

The process of conversion of scholarship into images was complicated for several reasons. First, there were ambiguities in scientific discussions about the rate of change of global temperature. Second, there has been an explosion of scholarship about global warming and its effects, including the description of numerous problems that scientists have been finding for me to consider. Third, there was the decision I had to make about the parameters of what I would choose to cover with the video. Fourth, was how or whether to present the debate from both sides of the political spectrum. Fifth was deciding how to select from my own artistic productions to make points both academically and aesthetically. Finally, there was the time I spent learning to use the video editor program and its functions. To define my research and prepare an appropriate visual presentation I had the advice of Professor Wendy Luttrell helping me to overcome the challenges of each step. Her experience with the transformation of knowledge into images and awareness of visual research methods was very important to do this project.

#### Avoiding Political Deliberations:

The sea level rise produces a sequence of problems including coastal areas floods, human migration, destruction of the habitats of coastal areas and coastal ecosystems. I wanted the video to feature the actual challenges that people face as consequence of the suffering produced by sea

level rise independently of the temperature's rate of change. I wanted to adopt political neutrality to avoid becoming an echo of a political position. The academic and scientific discussions also are often used to promote ideological propaganda and my aim was to visually represent the problem with as little political bias as possible. As a consequence, I discarded all document and video that did not fitly into this personal determination.

### Setting Limits:

The goal of this work is to learn and to explain the risks of the rise of sea level while avoiding deliberations about global warming. The idea was to resist falling into deliberations of climate change because it is politically charged and either position becomes bent and influenced by a political perspective. I learned that climate change is very complex, multi-dimensional and it presents great variety of manifestations and effects, as well as unexpected consequences. It was a difficult task to define the scope of the problem and to present an issue narrow enough as subject-matter that could be dissected from the bulk of changes produced by global warming. The process of selection allowed me to define and to frame a specific problem to research. I chose sea level rise, but even this focus results in multiple problems.

In addition, I understood that the problems produced by the rise of sea will impact human and natural habitats. Initially, the research shows that the immediate damage is to populations living in coastal places. These places include the human geography of big cities where the floods will push migratory movements and these migratory movements are the now being called "climate refugees." This is another problematic issue because national and international migrations have historically been natural and normal behaviors. However, the treatment of climate refugees complicates the politics of who may and should be able to cross national

borders and seek asylum. This becomes a challenge to policy makers and adds another issue to their agendas regarding immigration. I chose not to address these politics in the video. Instead I wanted to expose the human movement sparked by the sea level rise, limiting its focus to explain which populations are at risk and the urgency to prevent the destruction of communities or their urgent need of moving. My aim was not to identify a cause for the damage, who is to blame, or to present solutions. The video does not include any processes to promote social justice; therefore, I avoid all kinds of ethical or moral statements that can represent a judgment. The rationale of production was not to go further into philosophical or legal deliberations about the damage. The common scope of researchers working on climate change and sea level rise has focused on scientific discoveries of the trend implying that every day that goes without preventive action, the world moves toward a worse scenario. The human dimension of ecological damage is often emphasized.

In my research I became aware that the sea level change not only affects cities and communities of people living in coastal places, it also reaches natural habitats. I learned that the extension of the damage is broad; therefore, I had to decide how to treat the destruction of natural habitats and indigenous species. Again, another problem was establishing how to present the extent of the damage. The warming of the ocean produces a chain of reactions, starting with an increase of the volume of water as a consequence of Arctic and Antarctic melting. The warming of sea water indirectly produces others problems such as acidification as a product of the absorption of carbon dioxide, and the depletion of oxygen produced by the proliferation of algae that extract the oxygen depriving animals and plants of this essential element. The extent of collateral biological damages due to the warming of sea waters are outside the focus of this work. The limit of this capstone is to describe current threats to the life in different habitats such

as estuaries, marshes, and mangroves; and the risk of disappearing big deltas such as those of the Nile or Ganges rivers that will result from the destructive effects of lasting floods of marine salty water. But the extent of the rupture of chains of life that exist on these places is left outside the scope of this capstone limiting its focus on ecosystem damage.

Coastal communities are affected by environmental pollution produced by human settlement, and these are indirectly related to seawater floods. An example of this is plastic debris accumulated and deposited in coastal areas by seawaters. These were not included in this capstone. Indeed, environmental destruction produces health risks due to the destruction of productive land and food shortages that will increase malnourishment. The desertification of islands or coastal farms produced by invasion of salty water is a big problem for communities who rely on products harvested in this kind of soil. Basically, the flooded coastal places and islands lose the capacity to sustain life. Even more, flooding produces risks to the wellness of coastal area inhabitants who are exposed to new health problems such as the proliferation of deadly vectors as mosquitoes that can find a perfect habitat for reproduction on the flooded areas. There is also the danger of the organic contamination of fresh water sources by the floods, including contamination of underground aquifers.

The research and specific identification or detailed description of health dangers is not part of the focus of this project. This capstone focuses on the destruction of infrastructure, farms, sources of fresh water and food, and describes the process of desertification and erosion; each of these problems can be subject matter for further investigation.

Delimitation of Floods:

Several kinds of floods are related to sea level rise, and all kinds of floods are related to weather change. Setting a limit to the scope of the floods I would research, and to produce the video was cumbersome. This choice was complicated because flooding produced by surges is eased by sea level rise. Also, tides can become destructive once their reach is extended by the sea level rise. Surges are floods pushed by strong winds but not by sea level rise. Tides can be more destructive and intrusive as a consequence of the high sea level, but tides are not by themselves a product of sea level rise, so I did not consider these in the video. In addition, the floods produced by rains, hurricanes, monsoons, and others were not researched; although these are part of the climate change phenomenon that scientists study. An interesting case is the Ganges River delta because it is flooded regularly and it is a cyclical recurrent phenomenon. However, the delta includes different ecosystems, and one that will be directly affected by sea level rise is the mangrove forest of Bangladesh. This mangrove forest is the biggest in the world and its over flooding will destroy vegetation, produce lack of oxygen, spread salty water over fertile soils, and this whole sequence of problems are a consequence of sea level rise. This problem will push a mass migration of millions of delta's inhabitants. Sea level rise will also affect millions of inhabitants living in under-sea level lands, or in only a few feet over sea level, including millions in some the largest cities of the world. I chose to focus on increasing level of the sea that will flood populated centers, ecosystems, and fertile soils of coastal areas. This delimitation of the subject matter excludes phenomena eased by the rise of sea or those not related, although these too are products of climate change.

## Best Practices to Realize the Project Goal

### Getting Hardware:

The first technological step was getting access to a good computer with appropriate capacity to do a good production. One of the main problems of video production is the great amount of bits (RAM) necessary to process each frame. Each frame needs memory and processing capacity because video-processing deals with at least a dozen frames per second. Therefore, the computer's speed for processing is important. The computers of the Graduate Center have some limitations, thus I needed to secure access to better equipment with capacity to do the job smoothly, otherwise the computers crash, and stop working and the loss of material is frequent. The production of this project needed a computer with capacity to capture screen shots with a good resolution, image processing capacity and capacity to process 3D images. Working with digital visual material means having the capacity to capture, record, and edit videos at enough speed and without crashes.

With good screen capturing capacity, the edition of the video was possible without loss of material or waste of time solving technical problems. Indeed, film equipment was not necessary because the video was made with screen captures and inserts of photographs. In addition, a few images were produced and processed with a smart phone, or a small photographic camera. The quality of the production is enough to be displayed on a TV screens or a computer screen. A computer with more capacity is necessary to process and edit more time and better resolution.

### Getting Software:

A second decision was the choice of software to produce a semiprofessional video. The first and easily accessible and available platform is Windows 10, thus the logical program was Windows Movie Maker (WMM). However, WMM has many limitations and probably is technologically lagging because several software producers are offering better video processors, mainly to use with Apple computers. Another important limitation of WMM is its inability to do screen captures. This project is based on multimodal material and includes podcasts, photographs and screen snapshots which WMM cannot process. WMM cannot upload many common formats. Moreover, the constant crashing of Microsoft's programs running on the windows 10 platform was incomprehensible and unbelievable.

The offer of programs to record and edit video is great, however some programs are expensive and these do not offer constant actualization which can mean having to purchase the updated software again. After discarding the use of WMM, I started the search of an open-source program. Between several free products I decide upon OBS Studio. This program is better than WMM and provides a good set of tools to do amateur editions with screen captures. However, this program crashed frequently and the records become lost. In addition, the use of its applications is complicated; probably this program is a good option for a professional video producer because its commands are complicated and difficult to set. The third option and final choice was the VSDC program with specific applications to record the screen, to produce slideshows, and to do camera records with an interface that is easy to use. Once a screen capture is done, it is easily uploaded to the video editor and once it is edited it is possible to export in good amount of video formats. This program is semiprofessional, has good amount of tools, and it is relatively user-friendly. Another important trait is its free constant actualization. This program runs smoothly on Windows 10 platform and never crashes.



Getting Software to Record and Edit Sounds:

Because I had to produce a soundtrack I downloaded the Audacity program. It is a good program, has appropriate capacity and tools, but some commands are difficult to use, especially for recording. I downloaded and edited music, effects, and podcasts. This program does not edit sound track from clips, but its formats are compatible with VSDC video editor, and it charges easily Audacity sound tracks. The VSDC video program allowed some sound edition and this trait diminished the use of a sound program. I recorded several podcasts that I did not add to the video because some of these recordings lasted more than an hour and my video clip was five minutes long. In sum, Audacity was useful to download, edit, and add sound effects to the downloaded music and special effects.

URL:

<https://vimeo.com/user68406434/sealevelrise>

#### Relationship to Track and Course of Study

The white paper requires a description of the capstone's relation to the courses work of the individualized track, thus I am writing how the course work of my career is related to the sea level rise. Indeed, *Latin American Studies* describes how indigenous people used to live environmentally friendly and with a sustainable economic system. These people had a cultural clash with the Spaniard conquistadors and their high culture, and the colonial extractive economy led to destruction of natural resources and ecosystems. Obviously, the natives had experiences

facing natural disaster, and the new human geography in towns and cities changed their centuries-preserved habitats. The course *The Political Ecology of Social and Environmental Justice* deals with the human-nature relationships and it studies the unsustainability of modern lifestyle and culture.

In *Sociology of Culture* I learned that one of the traits/component elements of Western economy and culture is food, and food requires agricultural production in farms. Thus, the Latin American plethora of natural resources has been destroyed, and ecological systems are disappearing as consequence of the constant quest for lands to farm and mine. This constant transformation produced by immigration and the new culture of overconsumption eased the risk of catastrophes, as it is studied by *Introduction to Security Studies*. Although the vision of this capstone work is global, Latin American shores suffer the effects of the phenomena and are another case of study.

Coastal cities suffer floods alongside the catastrophic natural destruction of habitats that affect ecological systems that exist in shores and coastal cities. A specific case is mangrove, the forests with capacity to survive some amount of salty water that often have been destroyed by new urbanizations of towns and cities that become vulnerable to sea surges, and now the sea level threatens several places around the world. Urban development produces two kinds of destruction. First, the destruction of the ecological system condemns plants and animals living on the mangrove's system to disappear. Because mangrove protects shores from erosion the destruction of this natural barrier with capacity to contain sea floods and surges makes coastal urban developments prone to constant floods. This phenomenon is well known in Florida where marshes were dried giving place to cities that now are suffering constant floods as consequence of urbanism and human settling; also several islands in the Pacific are in an extreme situation and

beginning to disappear. Moreover, populated deltas of big rivers will flood permanently. These economic, social, and ecological symbiotic relationships are the subject matter of *The Political Ecology of Social and Environmental Justice*, and the course *Introduction to Security Studies* which provided a good scope of the dangers the world is facing. In this case, climate change produces a great variety of changes spurring risks of catastrophes, and sea level rise threatens not only millions of individuals living on coastal regions, but also threatens and destroys fresh water sources including underground reserves. There are threats to health too, because after flooding the possibility of epidemics is great. Thus, millions of inhabitants of big coastal cities such as Osaka, New York, Miami, Boston, and Rio de Janeiro will suffer the consequences of sea floods. The rise of sea level allows surges and storms to go deeper inland producing erosion and loss of productive infrastructure. It is easy to understand consequent changes in estuaries and the destruction of great amount of natural habitats as deltas, marshes, and mangroves. From the point of view of *Sociology of Culture*, I can understand that people from coastal towns will emigrate, or already are migrating, losing the opportunity to practice their coastal traditions. It is a rupture of community networks. The amount of climate refugees can reach a billion; three hundred million immigrants will be a direct consequence of sea level rise. This will force people to migrate toward cities, overcrowding and producing problems of security, health, housing and the challenge to adapt to the culture of city life.

*Security Studies* allowed me to understand global risks and threats, mainly those related to war. The political science courses, *Introduction to International Studies* and to *Concepts and Theories of International Relations* discussed theories related to international issues, and to the role of different actors in different levels of analysis. These courses also explain the role of governments and international organizations dealing with international threats and geopolitical

developments. There is an important academic connection with the course of *International Political Economy* because political theories study the quest of power; culture as soft power and military as hard power. These are tools to influence other countries, and thus, U.S. foreign relations can leverage what economic resources it considers important. The *International Political Economy* explains economics and international financial systems as part of the U.S. power that promotes the extraction of natural resources with the cheap labor of other countries. This extractive system produces environmental degradation and natural habitats destruction; therefore, the destruction of the means of life as a consequence of environmental catastrophes will push coastal populations to migrate and settle in cities.

Lifestyle in cities, according to *Sociology of Culture*, is understood as high culture and its consumerism; if it is good for business it is becoming not sustainable. The *Political Ecology of Social and Environmental Justice* course explains how natural habitats and communities disappear, as in this case, leading to migration from coastal places. Certainly, coastal human beings create settlements and their cultures are facing the threat of destruction as a consequence of the sea level rise produced by the melting of Arctic and Antarctic that will destroy their habitats. As an example of the danger, several studies alert that the complete melting of Greenland may increase the sea level by eighteen feet. A similar process was studied in *Introduction to Graduate Liberal Studies* and it is the historical advance of The Frontier toward the West and the establishment of plantations.

*Doing Visual and Arts- Based Research* is a course that challenges traditional research paradigms. This is a course that introduced me to the possibility of immersing myself in a subject matter beyond words and searching for a way to present research through multi-modal and multi-media formats and to consider ways to present multiple interpretations, including

through researchers own art forms. This course influenced me to include my own water colors related to sea level rise in my video. I see this course as related to the *Film History I* course I took. This course studies the interpretative work in each frame of movies to produce affective meanings, influencing how spectators “read” the message. Thus, it can become a powerful political and commercial tool like the first producers of silent movies theorized about the use of the new form of art to send a message with different objectives from visual research. The study of the evolution of early film procedures of production and edition was very useful to do this video production.

## EVALUATION

### Assessment of the Project:

The problem of sea level rise is one of the many alterations produced by global warming and this video allows us to visualize this problem presenting causes and consequences. The problem of sea level rise is a kind of silent catastrophe already affecting millions of the coast lands inhabitants. I think this video successfully presents the human drama, and it also presents how several communities are suffering in the face of this silent problem already. This video was a technical challenge that demanded my time to learn the use of the video editor and to get skills to do its production. Its value is something left to the viewers’ criteria.

My idea was to produce something appealing. However, it is my aim to evoke an emotional reaction to this almost unknown problem and I believe this aim is fulfilled. This video probably does not present with enough depth each of the problems sea level rise produces, but it

addresses important outlines of the problem. The richness of using new media, digital and my own visuals expand the frontiers of doing scholarly research.

The great amount of information available on internet opens new fields to research. This video wants to pioneer and promote the researching of images and other internet resources to do scholarship. The great amount of visuals and scientific material gives an opportunity to do research from the screen of a computer and this video production attempts to exemplify this trend.

This video successfully explains the destruction of productive infrastructure, housing, as well as natural habitats and ecosystems by sea level rise. It also explains the surge of mass migrations with social, political, and economic consequences at local, national and global level. These catastrophes will affect big cities around the world and will challenge local and national governments. Thus, this project is a professional eco-geo-political analysis presented visually.

In conclusion, this video reaches the scientific and artistic objectives of its conception. In addition, it presents the new field of research available thanks to the development of internet resources.

#### Setbacks and Challenges, and How These Were Handled

Because part of my studies are related to aesthetics, I wanted to add from my own artistic production. I worked for several weeks producing animations of my watercolors, but at the time of the video edition I thought these animations were confusing so I discarded them. Instead, I chose watercolors and photographs I had made as a way to weave together the flow of different sections and topics of the video.

### Scientific Uncertainty:

There is uncertainty about the forecasting of climate change effects. Scholars do not agree to what extent the climate will change and which data will best forecast future changes and threats. The scientific discussion is about whether the temperature will rise 1.5, or 2, or 3 degree Celsius. The lack of accord produces the difficulty to have a benchmark and because the changes are not happening quickly. An example of the uncertainty of the scientific projections is the recent discovery of a faster melting of Antarctic and Arctic. This recent discovery allows for a new more alarming calculation of the speed with which sea levels will rise.

### Copyrights:

Copyrights are an important legal issue because these protect the ownership of an inventor or intellectual producer. Indeed, Graduate Center and CUNY place strong emphasis in its protection and the instructions of CUNY to those who do academic work highly recommend its accomplishment. My first step in the research was to consult the US Government Copyrights Office website to understand how the law defines copyright and what kinds of works are protected. The Act and regulations are written to avoid intellectual property plagiarism. The law allows the use of protected works as Fair Use (section 107 of the U.S. Copyrights Act) to do academic research and production. The remaining question to legally produce this video was to find the correct interpretation of the academic exemption. Thus, the research to solve this question, and understand the extension of protection and legal allowances of fair use took time. Indeed, it took several weeks and the next step after consulting a government office website was to consult with my academic advisor, and she referred me to consult a specialized librarian at the

Graduate Center Library. The librarian's answer was that this was not a common question and I got an email explaining what copyrights are but not how to apply the academic exemption. The following step was to do a query on internet and find legal information and experiences.

Several specialized websites describe the difficulty in defining the use of a protected work and several case studies did not define a specific position about fair use. The cases that I consulted were related to the use of news or other kind of news material on commercial platforms. In most of cases, judges dismissed the lawsuit because the utilization did not produce economic damage to the owner, and the use was not specifically commercial.

The conclusion is that fair use allows the use of protected productions with academic purposes. Therefore, because this video is intended to fulfill an academic requirement, the use of protected materials such as images, sound, and photos is allowed. The second characteristic of this video production is that it will not produce profits, and this point is very important because once protected materials are used to make profits the owner has a right to get a share of the gains. Indeed, licensing copyrights is an established business and specialized companies get owners' rights to license the use of protected material, also some of them do their business on internet, establishing different categories of licenses according to the application and size of the divulgation.

The recommendation of the capstone academic advisor was to limit my use of all visual material to those that were open source, creative commons, or works produced with government funds, including works of international organizations that are free to use, and without any limitation to the extension of its utilization. In addition, many nonprofit organizations or individuals produce intellectual material allowing its utilization without limits. However, there is an important point to deal with and it is that open source or other authors that allow the use of



their productions always ask for the accreditation of their productions, and this requirement is popular among the creative commons productions and open source photographs. Also, few producers want to get a written request as procedure, even more, permits for the utilization of protected work is easy to get after the payment of a small fee. Furthermore, many websites or video producers explain their copyrights' policies clearly allowing academic application, but each producer has own policy and sometimes the academic use is not clearly explained.

In sum, the legal use of protected works in academia is clear, but the application on the new digital media is ambiguous and it can be difficult to comprehend. The academic utilization is well defined by law, but because the application of protected works in academic video production is new, and the issue is not clearly defined, the decision and advice to do this academic non-commercial work was to use mainly open source and commons productions giving the respective credits and merits, and respecting the identifications of the producers on the material.

#### Academic Challenges:

Scientists have to define a starting point from which begin to study the effects of global warming. The difficulty to define the level of temperature change is complicated by the constant increase of temperature and its multiple manifestations including weather pattern changes and the continuous generation of natural disasters. This discussion is important because every half degree of temperature change geometrically increases the problems and the reach of damages. The deliberation on whether the change will be one or two degrees Celsius, or upward up to the last worrisome proposal of a change of four degrees, can produce very different predictions of the effects on human habitats and ecosystems. My solution to this discussion was to select the

material for the video, and to do screen captures that deal with the broad range of change of temperature suppositions using the different projections and to allow viewers to learn about the different possibilities used as the starting point of scientific discussions.

#### Technological Challenges:

As previously discussed I faced many technological difficulties in producing the video, including finding adequate and efficient software to do screen captures and to edit the video. Because of my commitment to work with open source resources I downloaded VSDC Video Editor, the free program of Flash Integro, which runs without problems. The program is semiprofessional and it has great amount of useful tools. This program is very friendly to the user and I did not have any difficulty learning to use it. After learning to use the basics, I could learn besides while working on the production even at cost of some time. This program is free and it is a recommendable tool.

To produce a soundtrack I downloaded the Audacity program. It is a good open source program and it has appropriate capacity and tools, but some commands are difficult to use, especially how to choose the source of sound. With this program I downloaded and edited music, effects, and podcasts as previously described.

Finally, I added my digital photographs from New York and photographs of my watercolors. To take the photos of my watercolors I used the camera of my cell phone Samsung Galaxy 8. And I chose from my personal digital album few pictures from New York's places related to the sea level rise. I would like to remark that these photographs are not edited.

#### Successes and Failures of the Project

In the early days when I began to prepare the capstone abstract proposal I found essays, many of which dealt with the discussion of the temperature's gradient change. As I continued to search the literature I found a vast scholarship describing very well the chains of problems produced by sea level rise as a consequence of climate change and global warming. I saw my greatest challenge was to produce a five-minute production, to reduce the complexities into a short but effective visual narrative. I have been reading publications and watching videos for almost a year since I started to plan my capstone project, and to elaborate the proposal for the MALS Program. Nevertheless, I was worried about the scientific deliberation of the future rate of the change of temperature as I decided to do this project. This theoretical conundrum remains undecided among research institutes, universities, governments, and international organization researching different problems and publishing their discoveries with their particular prediction of level of change.

Because of the variety and amplitude of the problems produced by global warming, I had the challenge of selecting and defining a specific issue to research and produce a video. I have chosen and set limits with the advice of Professor Luttrell. After an exchange of emails and a meeting to define issues I decided on the following parameters for the project. It should represent the interdisciplinary character of my career, reflect the application of my individualized track, honor my own interests in eco-geopolitical analysis, and take the form of a multi-media presentation to explore and evoke the consequences of sea level rise.

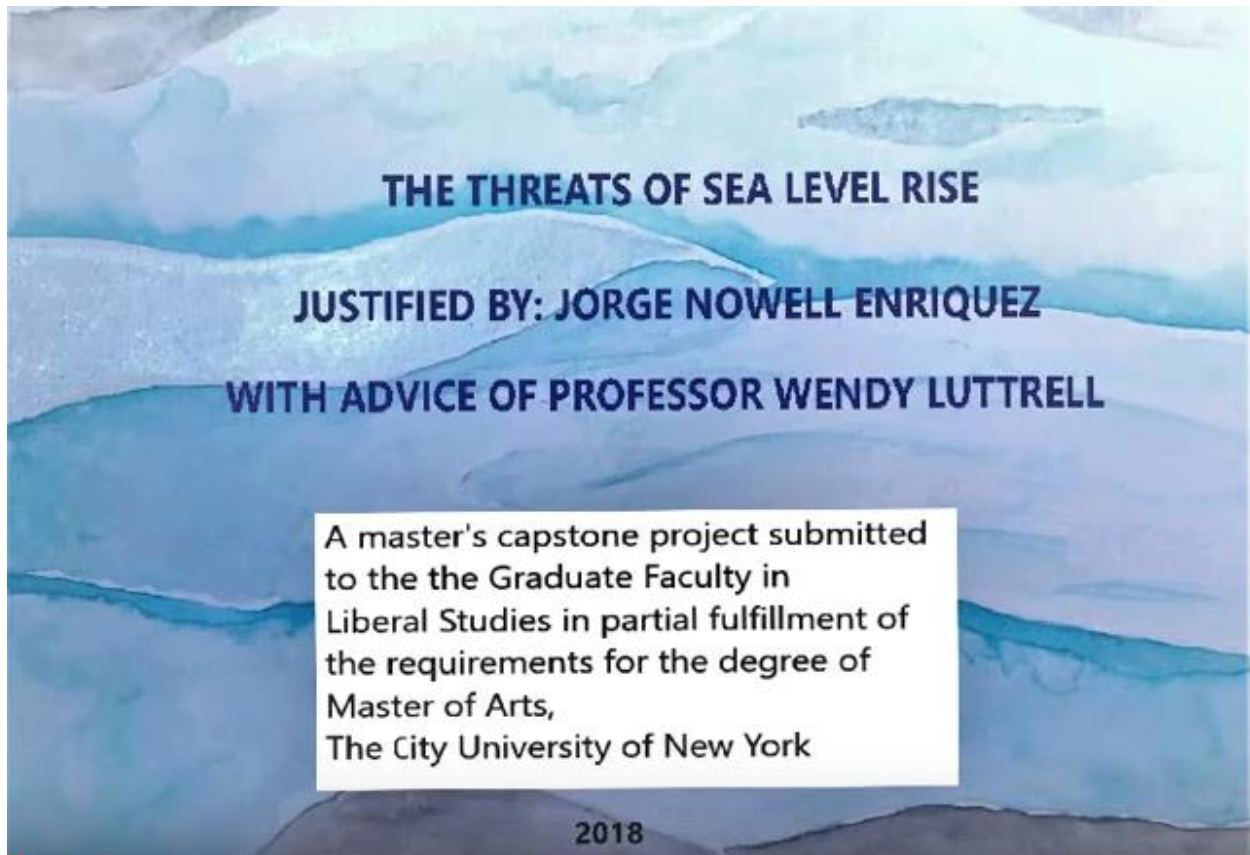
Continuation of the Project

The studies of the individualized track career and my capstone project will allow me to work analyzing the effects produced by intertwined fields that influence geopolitical issues: political systems, habitats, geography, and the availability of natural resources. By doing this project I learned about the effects of climate change and the geopolitical effects of natural disasters as these are related to the weather changes that affect the life of the whole world, from the production and transport of food, to how weather changes lead to catastrophes and scarcity of essentials for everyday life, and how these produce a mass migration of climate change refugees.

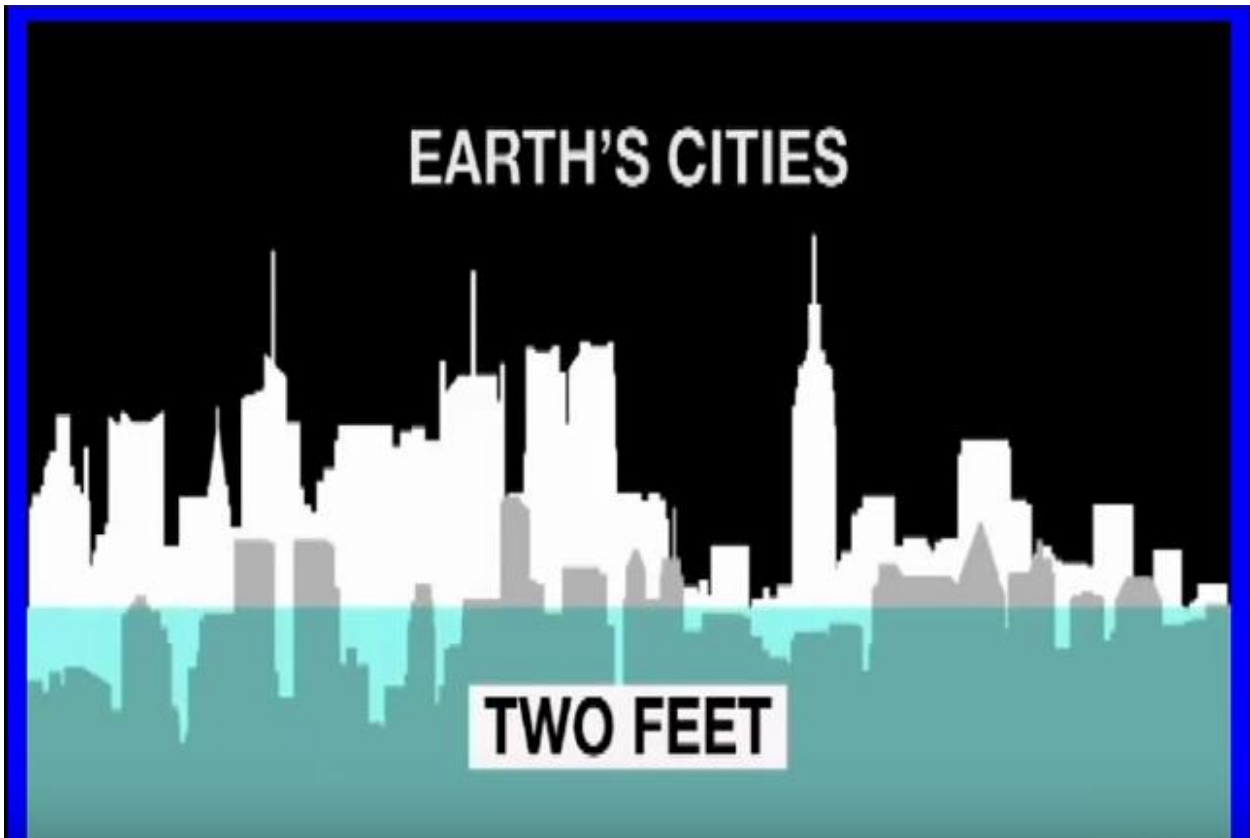
In short, understanding the changes produced by global warming and sea level rise, its political effects, possible natural catastrophes, and how these affect the ecosystems of both human and natural life will allow me to continue to investigate important global changes. I believe the Liberal Studies Program of the Graduate Center was the perfect place to design a topic that fulfills my specific needs to acquire the appropriate skills and tools to conduct professional research.

## APPENDIX

Screen shots of the completed work



This video is produced to fulfil the academic requirements to obtain the Master Degree in Liberal Studies of The Graduate Center of the City University of New York (CUNY), and it is product of academic research, and the recollection of image and sound from nternet. This video is published according to the FAIR USE described by the section 107 of The Copyright Act of 1976





Bangladesh is among the most vulnerable countries



**SALT MARSHES ARE COASTAL WETLANDS,**

**FLOODED AND DRAINED BY THE OCEAN'S TIDE**

## Video Attribution Information



ScienceCasts: Greenland's Thinning Ice  
by ScienceAtNASA





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