

Swallowed by the Sea

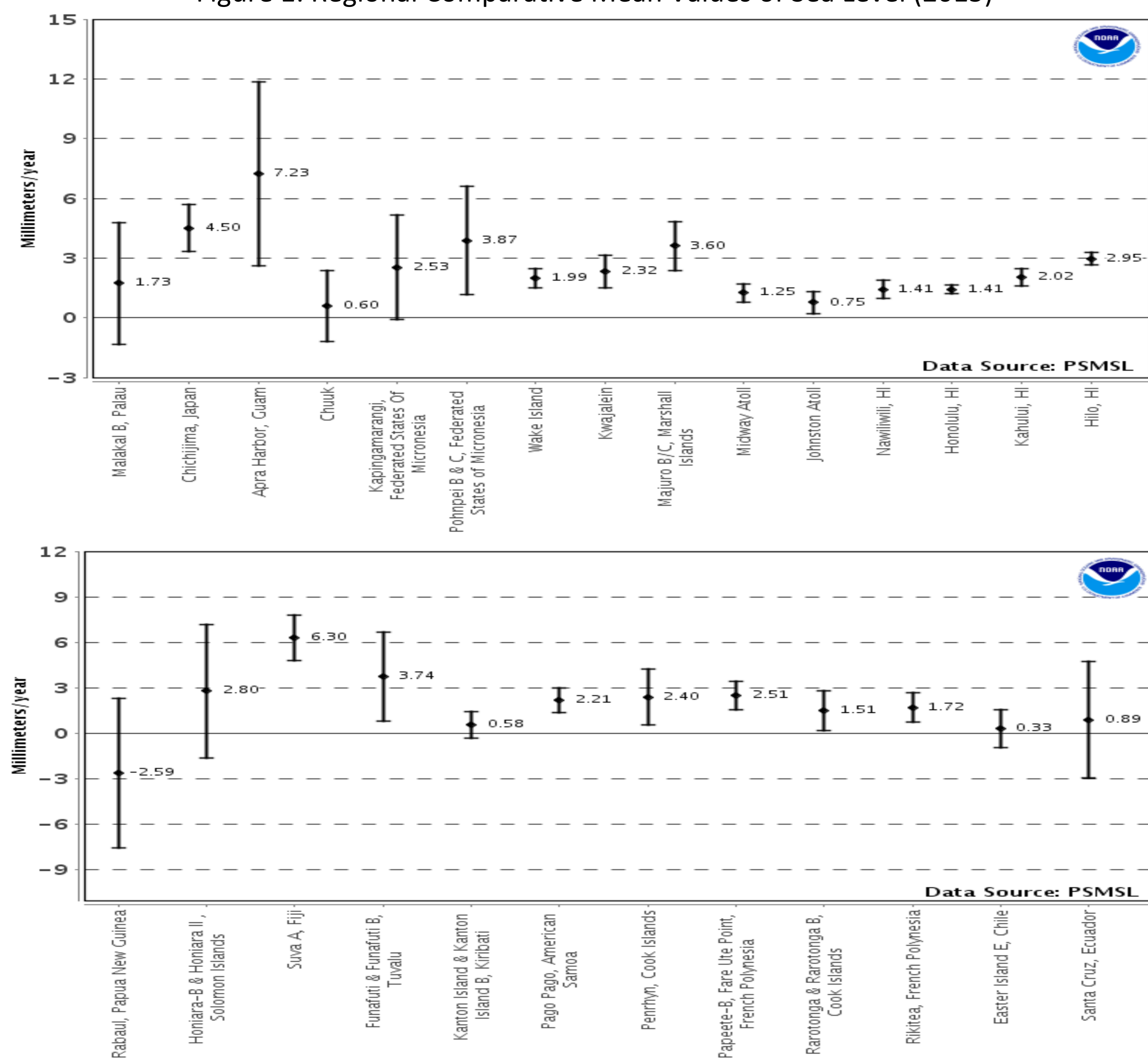
Climate Change, Environmental Refugees and the Pacific Islands

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INTRODUCTION

The Pacific Island nations face an unprecedented risk in the face of rapidly growing global warming. The small nations of Kiribati, Tuvalu, and Nauru face dramatic sea level rise far beyond the global mean sea level rise, eroding precious territory and threatening economic development. Given how a number of these small island nations are classified as Atolls (ring-shaped coral reef including a coral rim that encircles a lagoon partially or completely which are highly susceptible to erosion), it comes as no surprise that rising sea levels would be particularly efficient in destroying accessible land need for subsistence agriculture and tourism. With such a grave forecast for these small nations, the international community faces a sense of urgency regarding these populations limbo status between migrant and refugee.

Figure 1: Regional Comparative Mean Values of Sea Level (2015)



OBJECTIVES

This work hopes to explore the current data and trends surrounding migration rates and domestic push factors in the Pacific Islands. Primarily, this work contributes to current literature by investigating causal relationship between economic and environmental push factors on net migration trends, specifically for small developing islands in the Pacific Ocean. As climate change intensifies, these Pacific Islands will face untold damages in food and water supplies, unprecedented territory loss, and increased strain on the quality of life for people (Locke, 2009). This work seeks to answer the following questions: Is climate change creating migrants or refugees out of the populations fleeing the small developing islands of the Pacific?

DEFINITIONS

International law is failing to adequately capture the complex situation of these vulnerable populations. If predictions prove true and the small island nations of the Pacific cease to physically exist, would the citizens of these states then be stateless? De facto statelessness is narrowly defined and would most likely not cover citizens of states without territory (Ammer, Nowak, Stadlmayr, Hafner, 2010). Environmental migration has been accepted in studies, workshops, and conferences giving weight to environmental factors as a motivation of migration, but the difficult shift toward 'environmental refugee' has yet to happen (Gemenne, 2015). If we can easily conclude the difference between migrations and escapes lies in the degree of choice one has in the process, why then is the debate continuing? The citizens of these sinking states are not without fear, albeit fear of a different sort than identified by UN convention. This necessary step has yet to happen due to careful political moves made in the United Nations generating a discourse of non-ownership that seeks to protect borders and a refusal of the developed world to accept responsibility.

METHODS

There are number of factors to consider regarding the effects of climate change including sea level rise, population growth, social vulnerability, and economic considerations (Raleigh, Jordan, & Salehyan, 2008; Pelling & Uitto, 2011). The scope of this work is limited to only push factors in order to evaluate what drives people to leave their homelands. The data was utilized in a small-N panel regression model with random effect estimators to compare economic and environmental push factors as predictors of net migration rates in small developing Pacific Islands. Data was drawn from ESCAP (United Nations Economic and Social Commission for Asia and the Pacific) and NOAA (National Oceanic and Atmospheric Administration) databases. The data comprises 15 cases, one case contains overall data for all the small Pacific Islands and the remaining 14 cases are for countries under ESCAP jurisdiction. Unfortunately, yearly data in the ESCAP database was not available for each case. Therefore, in order to address these limitations, this work utilizes averages of interesting variables over 5 year waves beginning in 1991 and ending in 2015. The dependent variable for this model is net migration defined as "international immigrants minus emigrants divided by the average population of the country over a period." Traditional economic push factors such as unemployment, GDP per capita, and population growth were taken. Environmental factors for this model include the magnitude of disasters; frequency of disasters; and mean sea level rises.

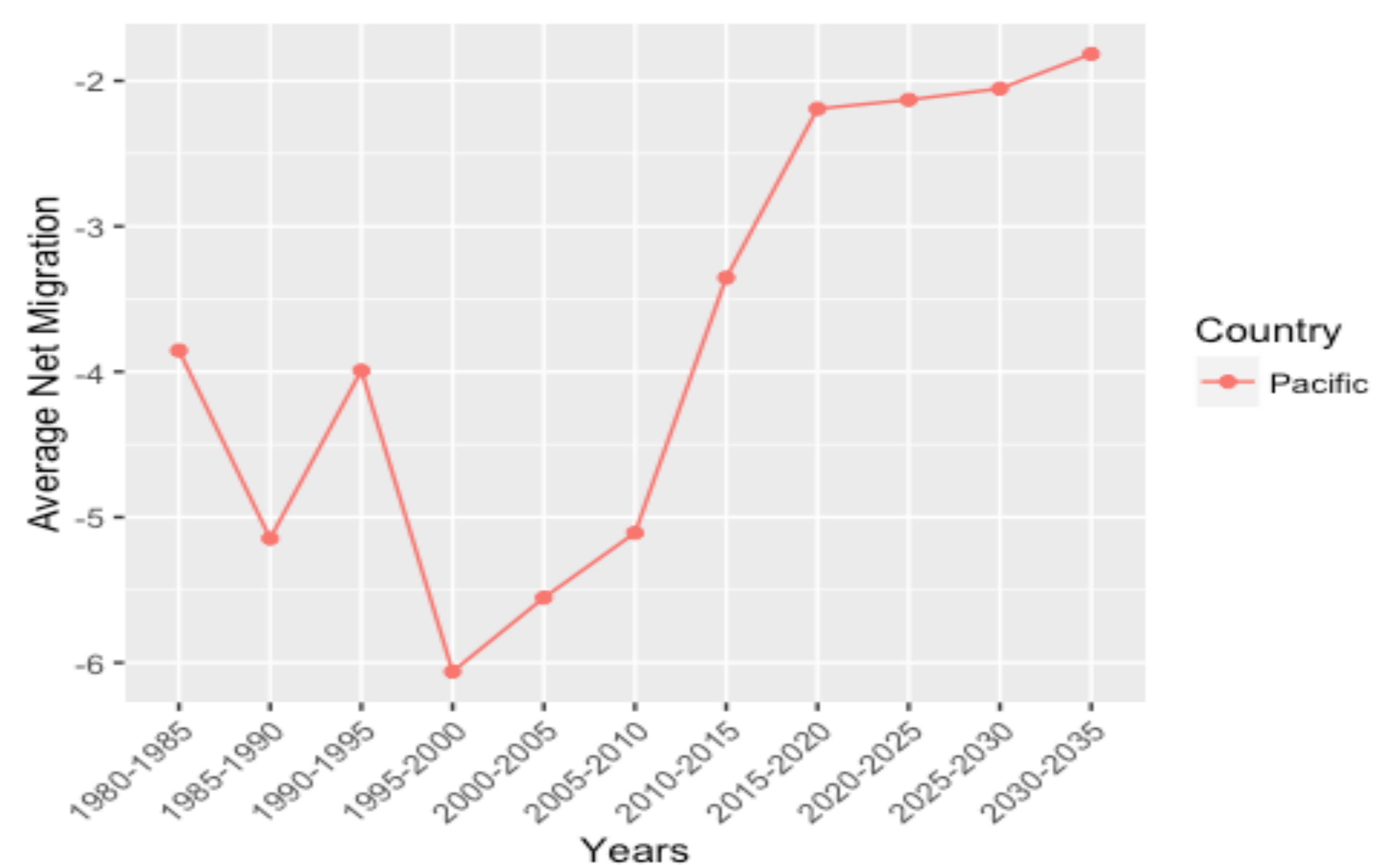
RESULTS & CONCLUSIONS

Based upon current analysis, the migration seen at this time in the Pacific is not at crisis levels. Regression analysis reveals that despite the alarming rates of environmental degradation present in the Pacific Islands, economic factors such as unemployment still provide the greatest predictive strength for explaining net migration trends for small Pacific Islands. As demonstrated from the regression model, environmental factors have a very small but significant push effect upon migration in the small island nations of the Pacific region. For the time being, environmental factors are not substantial enough to directly cause populations in the Pacific region to migrate in mass internationally. However, this does not necessarily warrant avoiding use of the term environmental refugee. The most compelling arguments for the expansion of the definition of refugee to include environmental factors should lie in (a) the recognition that the predicted effect of climate change has an undisputed human induction (Black, 2001) and (b) the recognition of these people as vulnerable populations fleeing a situation created by the unique characteristic of geography.

Table 1: Panel Data Regression Analysis

	Dependent variable:		
	(1)	(2)	(3)
Unemployment	0.834 (0.579)		1.075*** (0.229)
Population Growth	-2.787 (1.271)		1.369 (0.806)
GDP per capita	0.0001 (0.0001)		0.0002*** (0.00003)
Disaster Magnitude		-0.026 (0.075)	-0.157*** (0.039)
Disaster Frequency		0.126 (0.409)	-0.330 (0.202)
Mean Sea Level Rise		3.531** (1.598)	2.765 (412.575.800)
Disaster Frequency:Disaster Magnitude		0.002 (0.005)	
Disaster Frequency:Disaster Magnitude:Mean Sea Level Rise			0.003*** (0.001)
Constant	1.548 (5.171)	-15.218*** (5.121)	-17.292 (1.935.445.000)
Observations	15	27	15
R ²	0.576	0.244	0.896
Adjusted R ²	0.422	0.199	0.418
F Statistic	4.981** (df = 3; 11)	1.777 (df = 4; 22)	8.589*** (df = 7; 7)

Figure 2: Predicted Net Migration Trends for the Pacific Islands



FUTURE RESEARCH

As this small-N regression analysis was limited in scope to explore the development of causality in the movement of populations, further research would benefit from more robust sea level data. Estimations of current sea level trends are being monitored by a number of agencies. As climate change continues to push the limits of adaptability and development for small island nations in the specific, more reliable sea level data will be crucial for identifying the "crisis" point of migration. Additionally, further research should expand the cases for analysis to allow for the introduction more diverse economic and environmental variables. This work solely focused upon small developing Pacific Islands to analyze the unique environmental hazard of territorial disappearance. However, there are a number of other states and ecological risk areas that could provide valuable insight into overall patterns of environmentally induced migration. It would be particularly interesting to examine differing climate change induced internal migration trends between the developed and developing world.

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