2018 ICM
Problem E: How does climate change influence regional instability?

The effects of Climate Change, to include increased droughts, shrinking glaciers, changing animal and plant ranges, and sea level rise, are already being realized and vary from region to region. The Intergovernmental Panel on Climate Change suggests that the net damage costs of climate change are likely to be significant. Many of these effects will alter the way humans live, and may have the potential to cause the weakening and breakdown of social and governmental structures. Consequently, destabilized governments could result in fragile states.

A fragile state is one where the state government is not able to, or chooses not to, provide the basic essentials to its people. For the purpose of this problem "state" refers to a sovereign state or country. Being a fragile state increases the vulnerability of a country's population to the impact of such climate shocks as natural disasters, decreasing arable land, unpredictable weather, and increasing temperatures. Non-sustainable environmental practices, migration, and resource shortages, which are common in developing states, may further aggravate states with weak governance (Schwartz and Randall, 2003; Theisen, Gleditsch, and Buhaug, 2013). Arguably, drought in both Syria and Yemen further exacerbated already fragile states. Environmental stress alone does not necessarily trigger violent conflict, but evidence suggests that it enables violent conflict when it combines with weak governance and social fragmentation. This confluence can enhance a spiral of violence, typically along latent ethnic and political divisions (Krakowka, Heimel, and Galgano 2012).

Your tasks are the following:

Task 1: Develop a model that determines a country's fragility and simultaneously measures the impact of climate change. Your model should identify when a state is fragile, vulnerable, or stable. It should also identify how climate change increases fragility through direct means or indirectly as it influences other factors and indicators.

Task 2: Select one of the top 10 most fragile states as determined by the Fragile State Index (http://fundforpeace.org/fsi/data/) and determine how climate change may have increased fragility of that country. Use your model to show in what way(s) the state may be less fragile without these effects.

Task 3: Use your model on another state not in the top 10 list to measure its fragility, and see in what way and when climate change may push it to become more fragile. Identify any definitive indicators. How do you define a tipping point and predict when a country may reach it?

Task 4: Use your model to show which state driven interventions could mitigate the risk of climate change and prevent a country from becoming a fragile state. Explain the effect of human intervention and predict the total cost of intervention for this country.

Task 5: Will your model work on smaller "states" (such as cities) or larger "states" (such as continents)? If not, how would you modify your model?

Your submission should consist of:

- One-page Summary Sheet,
- Your solution of no more than 20 pages, for a maximum of 21 pages with your summary.
- Note: Reference list and any appendices do not count toward the 21-page limit and should appear after your completed solution.

References:

Krakowka, A.R., Heimel, N., and Galgano, F. "Modeling Environmenal Security in Sub-Sharan Africa – ProQuest." The Geographical Bulletin, 2012, 53 (1): 21-38.

Schwartz, P. and Randall, D. "An Abrupt Climate Change Scenario and Its Implications for United States National Security", October 2003. http://eesc.columbia.edu/courses/v1003/readings/Pentagon.pdf

Theisen, O.M., Gleditsch, N.P., and Buhaug, H. "Is climate change a driver of armed conflict?" *Climate Change*, April 2013, V117 (3), 613-625.

Helpful Links:

Fragile States Index: http://fundforpeace.org/fsi/

The World Bank: http://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations

2018 年 美 赛 ICM -E题翻译

问题 E：气候变化如何影响地区不稳定？

气候变化的影响已经发生并且因地区不同而不同，这些变化包括持续增加的干旱、冰川萎缩、动植物种类变化以及海平面上升。政府间气候变化专门委员会认为，气候变化导致的净损害成本可能很大。这些影响中的很多会改变人类的生活方式，并有可能导致社会和政府结构的弱化和崩溃。因此，不稳定的政府可能会导致国家的脆弱。

脆弱的国家是指政府无法或者不愿意为人民提供基本要素的国家。就问题本身而言，“国家”是指一个主权国家或国家。脆弱的国家增加了该国人口遭受诸如自然灾害，减少耕地，不可预测的天气和气温升高等气候冲击的影响。发展中国家普遍存在的不可持续的环境实践，移民和资源短缺可能会进一步加剧治理不力国家的情况。(Schwartz and Randall, 2003; Theisen, Gleditsch, and Buhaug, 2013) 。可以说，叙利亚和也门的干旱进一步加剧了国家情况的恶化。环境压力本身并不一定会引发暴力冲突，但有证据表明，当它与治理薄弱和有社会分裂的国家相结合的时候，它就会导致暴力冲突。这种融合可以加剧暴力的持续，典型的是潜在的种族问题和政治分歧问题（Krakowka,Heimel, and Galgano 2012 ）

你的任务如下：

任务一：制定一个模型来衡量一个国家的脆弱性，同时衡量气候变化的影响。你的模型应该能够在国家的脆弱、相对脆弱和稳定的三种情况下均可行。还应该确定气候变化如何通过直接或间接的手段影响其他因素和指标来增加脆弱性。

任务二：选择由脆弱国家指数确定的十大最脆弱国家之一（http://fundforpeace.org/fsi/data/ ），并确定气候变化如何增加该国的脆弱性。使用你的模型表明如何减少国家的脆弱性。

任务三：在另一个不在前十名单的国家使用你的模型来衡量其脆弱性，看看气候变化如何推动它变得更加脆弱。确定任何明确的指标。你如何定义一个临界点，并预测一个国家何时可以达到这个临界点？

任务四：使用你的模型来显示哪种状态下的干预可以减轻气候变化带来的风险，并防止一个国家变成一个脆弱的国家。解释人为干预的影响，并预测该国进行干预时所产生的总成本。

任务五：你的模型可以在较小的“州”（比如城市）或者更大的“州”（比如洲）工作吗？如果不行，应如何修改你的模型？

你的提交应该包含下面这些：

·一页总结表（One-page Summary Sheet ）

·您的解决方案不超过 20 页，最多加上您的摘要共 21 页。

·注意：参考列表和任何附录不计入 21 页的限制，应在完成的解决方案后给出。

参考：

Krakowka, A.R., Heimel, N., and Galgano, F. “Modeling Environmenal Security in Sub-Sharan Africa – ProQuest.” The Geographical Bulletin, 2012, 53 (1): 21-38.

Schwartz, P. and Randall, D. “An Abrupt Climate Change Scenario and Its Implications for United States National Security”, October 2003.
http://eesc.columbia.edu/courses/v1003/readings/Pentagon.pdf

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http://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonizedlist-of-fragile-situations