

## Abstracts

Summaries of research papers by CISTP\* Fellow / Diplomat in Residence, Alain G. Norman:

**Title: *Sea-level Rise and Maryland's Response(s) – An Assessment of Efforts to Strengthen Resiliency among Vulnerable Communities***

**Abstract:**

It is now well known that climate-change-related sea-level rise menaces many coastal communities and undeveloped shorelines, as well as entire nations. This paper examines the threats posed by sea-level rise to coastal communities in Maryland, how the government of Maryland has responded, and whether Maryland's efforts might provide helpful lessons learned for other places, including for developing nations, that face sea-level rise. Although Maryland's developmental level might, on the surface, appear to preclude the existence of meaningful best practices for some developing countries, there are meaningful parallels: Maryland, too, has key population centers and economic sectors that are endangered by sea-level rise. Moreover, certain historic sites and relatively traditional ways of making a living are at varying degrees of risk. A key finding is that Maryland has long striven to leverage national-level sources of funding, and to provide advice and financial support to communities that avail themselves of Maryland's programs, and it is at the local level that climate change adaptation work must be done. Thus, Maryland offers a positive example of how to foster useful connections between localities, and national agencies, as well as among regional peers. Nevertheless, as in other places, politics may influence the degree of funding for, and effectiveness of, such efforts. Importantly, it remains uncertain whether Maryland's efforts will prove sufficient, over time, to deal effectively with the magnitude of the threats, posed by climate-change induced sea-level rise, to communities that depend on the well-being of the Chesapeake Bay, its shoreline, and its watershed.

**Title: *Happy Motoring? Autonomous Vehicles and the American Way – Or, Autonomous Vehicles: Where Technology and Values Hit the Road***

**Abstract:**

This paper surveys the key issues with which Americans – technologists, lawyers, bureaucrats, consumers, and companies – will have to grapple if “autonomous vehicles” (AVs) are to be mainstreamed. The advent of AVs not only involves purely technical (e.g., software) challenges, but also questions pertaining to social norms, legal liability, and personal privacy. The report finds that “progress” on AVs is unstoppable, despite doubts about the need for, and/or socio-economic ramifications of, such cars. A variety of private sector actors (stimulated, in part, by earlier U.S. government seed funding) have the money, the know-how, and the will, to propel experimentation with AVs. Some new safety-related technologies will be readily adopted, and put into standard, non-autonomous cars. Yet it remains unclear whether AVs will, like today's cars, be owned by individuals, or whether AVs will be available for hire or fees like taxis, buses, or “car-sharing” platforms. Indeed, several factors may impinge on the mainstreaming of AVs as private vehicles, including the desire to enjoy driving, the possible decline in Americans' “love affair” with automobiles, and

the likelihood that AVs will initially be relatively expensive. Perhaps a larger obstacle consists of claims by AV boosters that AVs offer greater safety: Such claims may already have raised expectations that AVs will enhance public safety, thus increasing pressure on potential AV-related companies to demonstrate that AVs' algorithms can actually describe, and function in, the complicated material world, and thus reduce various risks currently associated with driving motor vehicles. Nevertheless, such considerations might not stymie AVs, given sufficiently clever publicity campaigns, which may have already started.

**Title: Algae for CO2 Mitigation from Coal-fired Power\*\***

**Abstract:**

Coal-fired electricity-generating units (EGUs) are significant emitters of green-house gases, such as carbon dioxide (CO<sub>2</sub>), that menace the well-being of humans and the environment. This paper contends that the widespread use of algae cultivation in conjunction with coal-fired plants, starting in the United States and later expanding into other major coal-consuming nations, could lead to short- and long-term benefits. These benefits include curbing various forms of pollution – including CO<sub>2</sub> – and the production of biofuels, feedstock, fertilizers, and/or plastics from algal biomass. Indeed, extensive use of algae might both free good land (for use as carbon sinks or for crop production), and reduce coal extraction (e.g., via co-firing of algal-biomass), thus helping the global environment. In the United States, the promulgation of a Clean Power Plan (CPP) by the Environmental Protection Agency opens the door for the coal industry to reduce pollution through the use of algae production for carbon capture and utilization (CCU), not just for possible carbon capture and sequestration (CCS). The CPP is, however, currently subject to numerous legal challenges, in part because the CPP is seen by some as another blow to the coal industry. Yet, the paper contends that coal companies and communities might benefit from new income streams – as well as from less pollution – if and as emerging algae-production technology is incorporated into coal production and combustion at EGUs. Also, given that coal use will increase worldwide – and given the deleterious effects of coal usage – far-sighted American firms that pioneer the combination of coal and algae production may well remain profitable at home and find willing partners and markets, abroad, in coming years.

**Title: An Inquiry into Water (In)Security in the Caribbean: At the Intersection of Natural and Human Limitations**

**Abstract:**

This report examines issues that some members of the mostly English-speaking nations of CARICOM (Caribbean Community) face as regards the quantity and quality of freshwater (especially groundwater), with a view to providing a preliminary assessment of the security implications that stem from actual or potential problems related to fresh water resources. The paper finds that many Caribbean countries must undertake more vigorous and comprehensive efforts to address the risks posed – due to potential water insecurity – to their societies and, by extension, even to their stability as nation-states. Future insufficiencies of fresh, usable water will likely be due to a combination of adverse climate change impacts (to include sea-level rise) and inadequate management of said water resources. Indeed, failure to manage better the use and quality of fresh, particularly aquifer, water may contribute to socio-economic dislocations (particularly in the

vitaly important agricultural and tourism sectors) that could lead, in turn, both to unrest and to increased out-migration to the dismay of neighboring nations, including the United States. Accordingly, the paper contends that it is in the interest of the United States to review all available funding, diplomatic, private sector, NGO, and multilateral options, in order to find the means for responding robustly to CARICOM societies' existing and potentially worsening water security issues. Regrettably, given that water issues and good water management involve numerous and complex cross-cutting elements, it will likely be difficult for the international community to switch from a crisis-response orientation to the promotion of long-term, systematic, and effective good water governance, particularly in some of the most vulnerable nations.

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\*\* Portions of this term paper were co-written with colleagues Tamara Link and Tasia Paraskevopoulos. A version of this paper, written as a policy memorandum to the top 10 coal-producing and/or coal-using states of the United States is expected to be published, in August 2016, by the on-line journal: The Journal of Science Policy and Governance; see: <http://www.sciencepolicyjournal.org/>.