

The Science of Mitigation and Adaptation Research in Virginia

A First Assessment Report of the State of Knowledge on Climate Change and Sea Level Rise Mitigation and Adaptation

Invitation to Participate

The Mitigation and Adaptation Research Institute (MARI) of Old Dominion University invites the academic community in Virginia to participate in a state-wide assessment of our knowledge on mitigation and adaptation with a focus on the practice-relevant knowledge societal stakeholders in Virginia need to ensure the livelihood of our communities under the expected changes in climate and sea level. If you are a faculty at one of Virginia's institutions of higher education or a researcher in a research institute in Virginia, and your expertise overlaps with one or more of the five main scientific areas described below, then we urge you to participate in one of the four roles defined on the previous page. We are in the process of establishing a web page for you to sign up and indicate what role you would like to take in the process. This web page will be available at <http://www.mari.odu.edu/1stmaar>. For questions, please contact Dr. Hans-Peter Plag, hpplag@odu.edu.

The Process

The process will be led by a team of three to five editors. The assessment will be carried out by chapter author teams, who will prepare draft chapters based on published literature. Contributing authors can provide input to the chapter author teams. In an initial kick-off meeting, the chapter authors will agree on general rules for the compilation of the chapter drafts and on the contents of the individual chapters. In a second meeting, the draft report will be presented and discussed. After this, the complete draft will be made available for review by the academic community in Virginia. Input resulting from this reviewing phase will be taken into account in the compilation of the final report.

Assessing the Practice-Relevant Mitigation and Adaptation Knowledge in Virginia

The science of mitigation and adaptation requires a detailed knowledge of the **hazards** and their causes, a thorough understanding of the **vulnerability** of the built environment, the embedded social communities, and the environmental life-support systems on which the welfare of these communities depends. **Foresight** in terms of possible futures and the consequences of our decisions is crucial for proactive planning of mitigation and adaptation. The societal and individual framework for **decision making** defines the processes that can lead to mitigation and adaptation. Finally, detailed knowledge of **options** for mitigation and adaptation viable in the given social, political, and economic context informs decision making.

The assessment report will be the first comprehensive assessment of our knowledge concerning mitigation of, and adaptation to climate change and sea level rise and the impacts in Virginia. The report will have a focus on practice-relevant knowledge. It will identify knowledge gaps and describe the research needed to close these gaps.

The report will be produced and reviewed by the academic community in Virginia, both in institutes of higher education and research institutes. It will be comparable to the assessment reports produced by the Intergovernmental Panel on Climate Change and national agencies with three marked differences:

- (1) It will cover the full range of mitigation and adaptation science;
- (2) It will also consider non-peer-reviewed literature such as state-mandated reports and reports produced by research institutes and governmental commission in the State;
- (3) It will not seek the endorsement of local, state or federal governments to allow the academic community to freely assess the knowledge without political constraints.

Modes of Participation

- Editors: three to five editors, preferably from different institutions will lead the process.
- Chapter lead authors: For each chapter, a chapter lead author will interact with the editors and ensure that the author team provides the draft chapter.
- Chapter co-authors: The members of the chapter author teams will work with the chapter lead author.
- Contributing authors: They will provide input in form of written statements to specific chapter

leads or, if appropriate, to the editors.

- Reviewers: They will participate in the reviewing of the draft report and provide written reviews of individual chapters to the editors.

Draft Table of Contents	Tentative Schedule
1 Introduction 2 The Hazards 3 Vulnerabilities 4 Foresight 5 Decision making 6 Options 7 Knowledge Gaps 8 Research Needs 9 Towards a Research Framework 9 Recommendations	- Invitation to participate: June-August 2015 - First author meeting: August 2015 - Second author meeting: January 2016 - Academic Review and Hearing: February - March 2016 - Final Report available: April 2016

Defining Mitigation and Adaptation

- Mitigation of Climate Change and SLR: actions that limit and reduce changes in the Earth's system that are known to force climate change or increase SLR.
- Mitigation of climate change and SLR impacts: actions that aim to protect against certain levels of impacts of climate change and/or SLR.
- Adaptation to climate change and SLR: actions that increase our preparedness for a wide range of probable climate change and SLR and allow us to adapt to the changes if and when they happen.

Rationale: There is Urgency

Climate change is impacting the daily life of people already. Many low-lying areas in Virginia are exposed to more frequent flooding as a result of the rise in local sea level. However, the current rate of sea level rise is low compared to what might happen over the next decades. In some areas, roads and buildings are by now exposed to flooding for up to 200 hours per year and this might rapidly increase to 500 or more hours per year in the near future. Increased risks of extreme weather events, economic costs due to disruptions of public services, changes in the social structure, reduced ecosystem services, increasing likelihood of heat waves and periods of drought, health impacts caused by reduced air quality and new infectious diseases, all are consequences of climate change and sea level rise already impacting lives in Virginia.

The time for mitigating climate change and its impacts and adapting to the changes is running out. There is an urgent need to develop adaptation science and to produce the practice-relevant knowledge that address all these issues. Climate change and sea-level rise pose unprecedented threats to communities across the world, especially the heavily-populated urban coasts. The changes experienced during the last century are unprecedented during the Holocene, that is, the relatively stable 10,000 years in which civilization could develop. There is increasing evidence that the changes anticipated for the 21st Century will push the climate outside the range known to civilization and into a phase of much greater variability. This challenges decision-making in all societal sectors, and it requires a new level of preparedness to mitigate the impacts and adapt to the changes.

