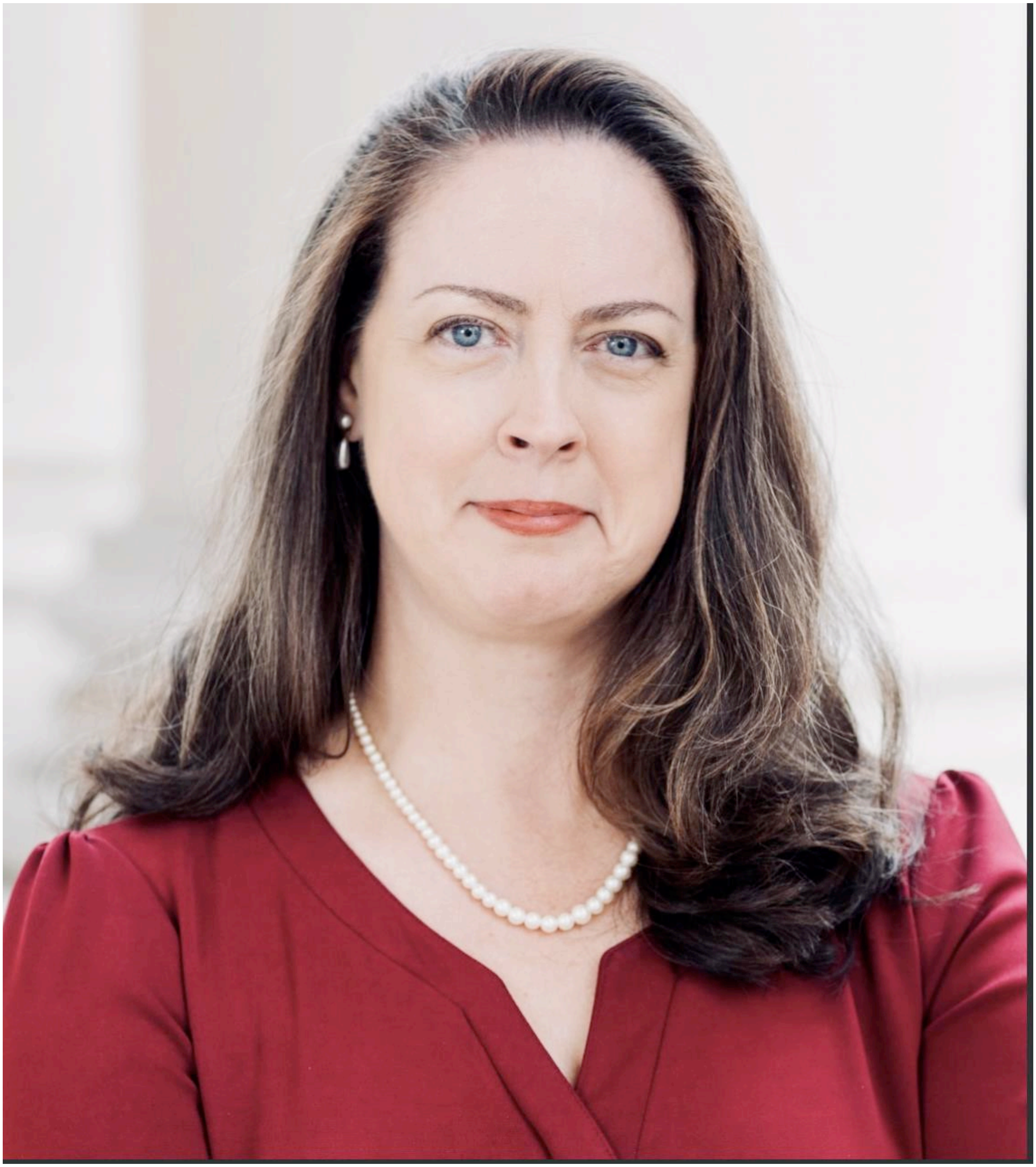
Maria Honeycutt, Ph.D., CFM

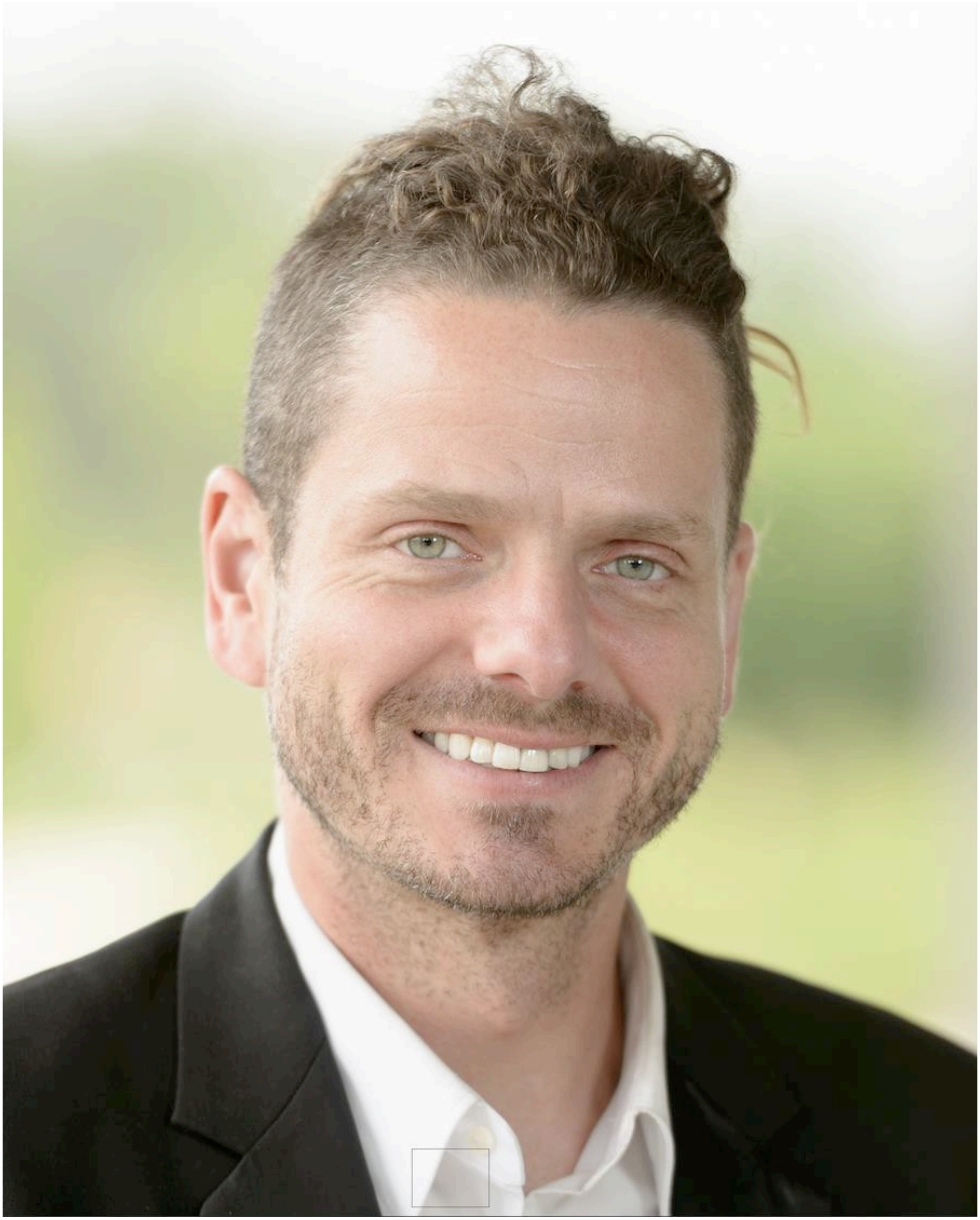
As Atkins' National Director for All-Hazards Resilience, Dr. Honeycutt focuses on enhancing delivery of resilience science and services across the firm's planning, design, construction, and asset management portfolios. She joined Atkins after 14 years with the National Oceanic and Atmospheric Administration's (NOAA's) Office for Coastal Management, where she developed national flood resilience policy and science-based decision-support tools. From 2019-2022, she was detailed to the White House's Office of Science and Technology Policy, serving two Presidential Administrations as Assistant Director for Resilience Science and Technology. In this role, she also led a Federal interagency group under the National Climate Task Force in capturing the state of the science for identifying future flood hazards and in designing decision-support resources for Federal Flood Risk Management Standard implementation. Prior to joining NOAA, Dr. Honeycutt was the U.S. Geological Survey/Geological Society of America's Congressional Science Fellow in the office of U.S. Senator Bill Nelson, with a portfolio spanning natural hazards, flood insurance, water resources, climate, and fisheries. She spent the preceding seven years as an engineering consultant supporting hurricane recovery along the Gulf Coast. Dr. Honeycutt earned a B.A. in geology from Smith College, an M.S. and Ph.D. in oceanography from the University of Delaware, and is professionally registered as a Certified Floodplain Manager.



Joshua Elliott

Abstract: AI for Critical Mineral Assessment with (AI4CMA) is a partnership between DARPA and USGS that is scoping opportunities to develop Artificial Intelligence and Machine Learning (AI/ML) tools to accelerate USGS critical mineral assessments (CMAs) through automation of key time-intensive parts of the CMA workflow. This effort aims to transform the workflow from a serial and predominantly manual approach updated intermittently to a highly parallel and continuous AI-assisted capability that is comprehensive in scope and efficient in scale, enabling USGS to accomplish their mission challenges, produce high-quality derivative products from raw input data, and deliver timely assessments that reduce exploration risk and support decisions affecting management of strategic domestic resources. To demonstrate the potential value of AI/ML tools in CMA workflows, in 2022 DARPA and USGS sponsored Machine learning challenges in two areas: 1) georeferencing maps of highly diverse types, scales, and quality, and 2) extracting point, line and polygon features from maps given labels on the map's legend. The results of both challenges showed good promise. This talk will focus on the results of these challenges and what comes next.

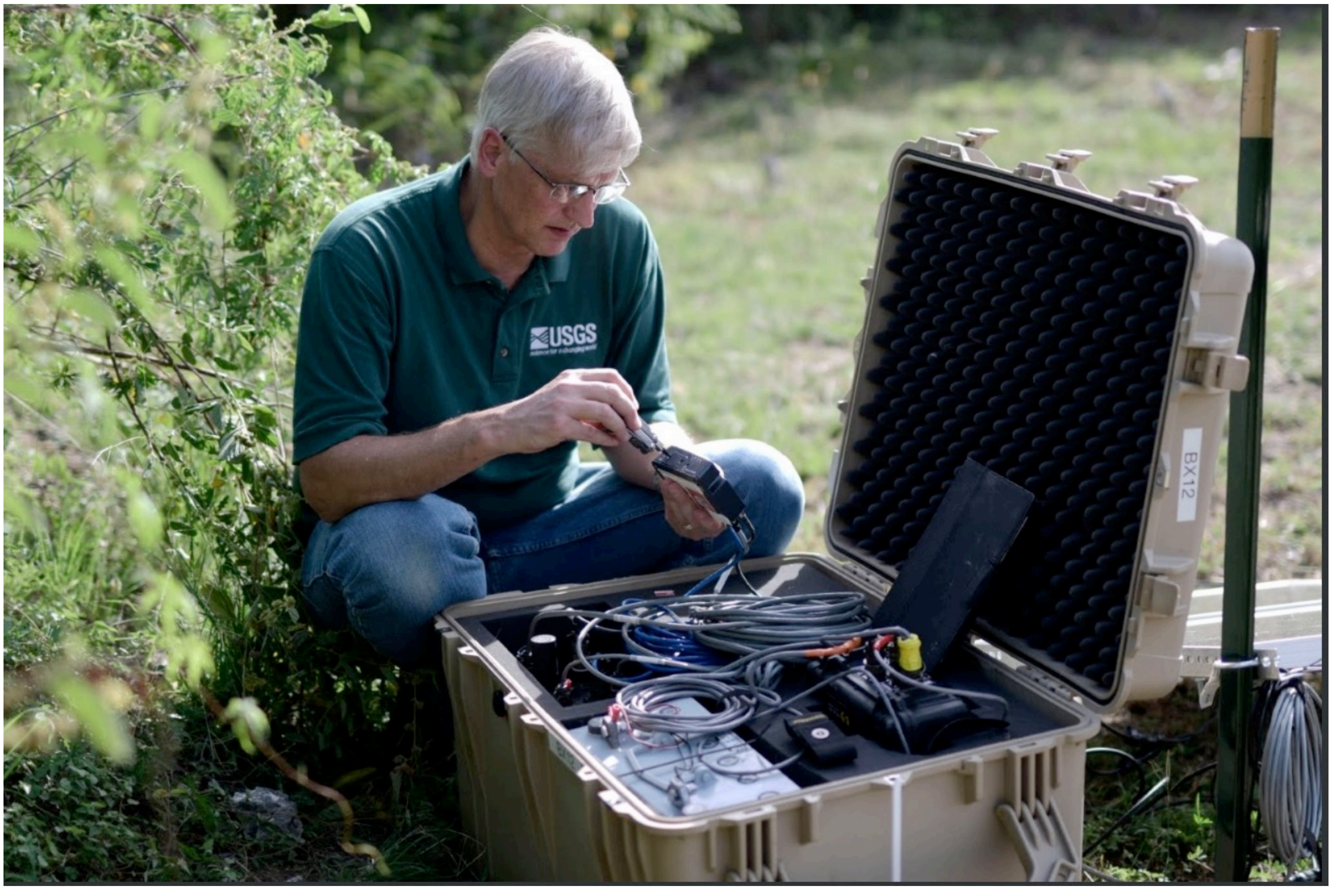
Bio: Joshua joined DARPA in 2017 from the University of Chicago Computation Institute, where he led research projects related to socio-technical change, optimal decision- and policy-making under uncertainty, and environmental variability and its impact on food, water and physical security. Elliott has also held positions with the Argonne National Lab, the London School of Economics and Political Science, and Columbia University. He joined DARPA to create programs to transform the way we leverage technology, including AI, to support science, analysis, planning, and decision-support workflows. During his tenure, he has managed eight programs, two challenge competitions, a dozen SBIRs, and six young faculty awardees.



Dr. Thomas Pratt

Abstract: Fragile geologic features like precariously balanced rocks (PBRs) can be used to constrain strong ground shaking at a site over the past few thousands to tens of thousands of years. Determining the ground motions that would topple a balanced rock places an upper limit on the strength of ground shaking since the rock became balanced. Such rocks could be especially important in the eastern U.S., where a lack of fault scarps limits paleoseismic investigations and where relatively low seismic attenuation suggests earthquakes could topple relatively distant rocks. In the northeastern U.S., dozens of glacial erratics were placed in balanced positions as the continental ice sheet melted 19,000 to 14,000 years ago. Balanced rocks in the southeastern U.S. were formed by erosion, and their ages are therefore more problematic. Here I describe a pilot study of three PBRs formed by erosion in the Blue Ridge of Virginia. These rocks are 110 to 150 km from the Central Virginia seismic zone, and about 90 km from the Giles County seismic zone, thus potentially providing upper limits on earthquake magnitudes within those zones. Photogrammetry methods were used to create detailed 3-D models of the PBRs to compute the locations of the centers of mass relative to their bases, with the resulting angle being crucial for estimating fragility. Topography also is known to amplify seismic waves, so modeled relations between hill geometry and amplification were used to estimate the topographic effect. Once the level of ground shaking needed to topple the most fragile rock was determined, a ground-motion model (GMM) was used to estimate the sizes of earthquakes in the surrounding area that would produce that ground motion. Preliminary results indicate maximum earthquake magnitudes of about M6.5 to M7 in the Central Virginia seismic one over the past few thousand years, which is consistent with the M~6.2 to M~6.5 earthquake(s) estimated from paleoliquefaction studies being near the maximum that have occurred in that time. It also is unlikely that an earthquake larger than about M6.5 has occurred in the Giles County seismic zone during that time. Estimating the ages of the PBRs in Virginia will require detailed dating, but the methods can be applied to glacial erratics in the northeastern U.S., where ages are better known.

Bio: Dr. Thomas Pratt is a research geophysicist with the U.S. Geological Survey’s Earthquake Hazards Program, and he serves as the central and eastern region coordinator of that program. He received his undergraduate degree in geology from Cornell University, and his masters and Ph.D. degrees in geophysics from Virginia Tech. He returned to Cornell for 6 years to work as a research associate before joining the U.S. Geological Survey in their Golden, Colorado office. He soon transferred to their Seattle office for 20 years before moving to the DC area about 10 years ago. His research focuses on seismic imaging and modeling of fault systems, and characterizing ground motions during earthquakes. His ground-motion work has recently turned to examination of precariously balanced rocks to estimate the strongest shaking from earthquakes. He recently completed a 5-year term as Editor-in-Chief of the Bulletin of the Seismological Society of America.



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