



C-RASC Annual Review

September 9, 2020



Listening...

Learning...

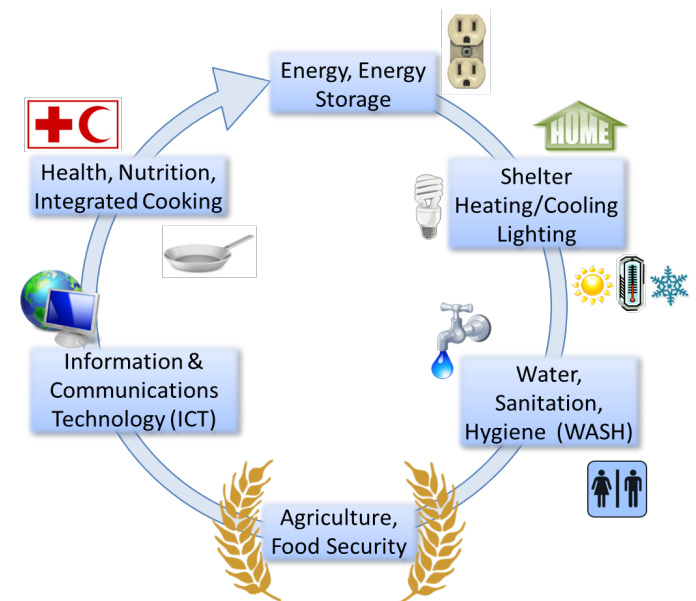
Lasting

College of Science
School of Business
Volgenau School of Engineering
College of Health and Human Services
Schar School of Policy and Government
Carter School of Peace and Conflict Resolution

Agenda



- ➡ • Vision/Members
- Goals & Accomplishments
- Plans



Introduction: C-RASC Vision



Communities worldwide can create life-changing social & economic opportunities through locally led resilience and sustainability initiatives



Our Work Emphasizes:

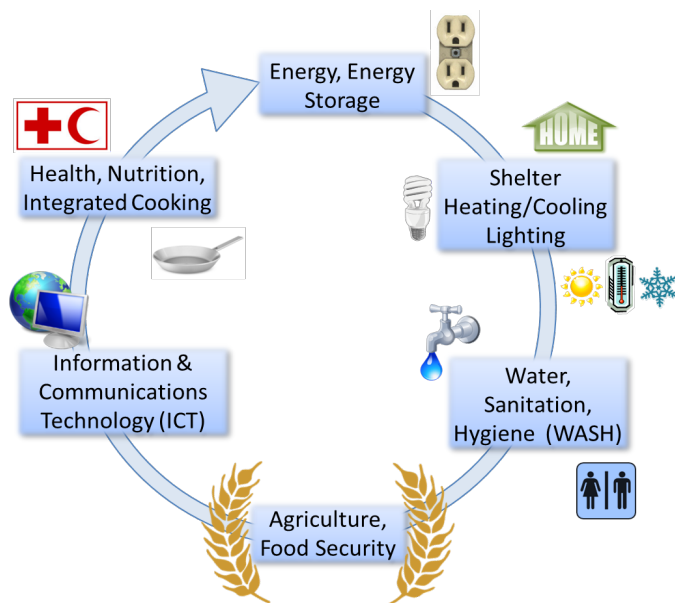
- Resilience **Challenges**

- Natural/Manmade hazards
- Political/Economic turbulence
- Stresses due to accelerating technological, social, climate change, population growth and poor policy choices

- Approaches to Resilient **Solutions**

- Community focus
- Knowledge-sharing (STAR-TIDES)
- Innovative economics
- Platform integration
- Learning and teaching

Platforms:



Introduction: C-RASC Team (1 of 3)



- Director: Kathryn Laskey (VSE, SEOR – Decision science, AI)
- Assistant Director for Research Operations: Hannah Torres
- Executive Advisor: Linton Wells II (VSE, C4I – public-private policy)
- Leadership Team:
 - Sara Cobb (Carter School - narrative)
 - Paul Houser (CoS, GGS – energy and water)
 - Constance Gewa (CHHS – nutrition)
 - Tonya E. Thornton (Schar – public service)
 - Richard Klimoski (Business – management and psychology)
 - Elise Miller-Hooks (CEIE – infrastructure)
- Research Staff
 - Paul Sujith Rayi (C-RASC STAR-TIDES)



member of proposal team
joined post-proposal

Introduction: C-RASC Team (2 of 3)



Core Members:

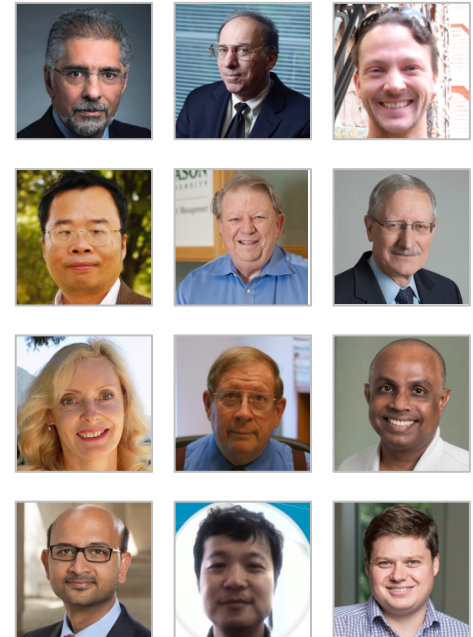
- Dana Dolan (Schar - Policy)
- Gerald Hanweck (Business - Finance, Real Estate Economics)
- Bill Kennedy (COS - Center for Social Complexity)
- Karina Korostelina (Carter School – Peacebuilding)
- Shima Mohebbi (VSE – Infrastructure Modeling)
- Hemant Purohit (VSE – Humanitarian Informatics and Social Computing)
- Lance Sherry (VSE – Systems Engineering)
- Dann Sklarew (COS – Environmental Policy and Management)
- Fengxiu Zhang (Schar – Extreme Events and Climate Adaptation)

Affiliate Members:

- Jean-Pierre Auffret (Business – Cybersecurity)
- Brenda Bannon (CEHD – Human-Centered Design)
- Benjamin Cash (CoS, Climate and Human Health)
- Viviana Maggioni (VSE – Hydrometeorology/Remote Sensing)
- Amb. Richard Kauzlarich (Schar – Foreign and Energy Policy)
- Leah Nichols (ISE – Sustainability/Policy)
- Pallab Sanyal (Business – Economics)
- Rupert Douglas-Bate (External – Global MapAid)
- Mekuanent Muluneh (External – Arba Minch University)
- Nathan Green (External – Marymount University)

Other Members

- Ali Andalibi (CoS – Molecular Biology)
- Liping Di (CoS – Remote Sensing, GIS)
- J Mark Pullen (Retired from VSE – Computer Science, Military IT)
- Vadim Sokolov (VSE – Optimization, Simulation, Transportation)
- Eugene Yu (CoS – Remote Sensing, GIS)



member of proposal team
joined post-proposal

Introduction: C-RASC Team (3 of 3)



Students from Supporting Units

- Tyler Goodwin (MS, Schar)
- Kristin Weis (PhD, Carter School)

Transdisciplinary GRFs

- Alexandra Albright (MPA, Schar)
- Wanru Li (PhD, VSE)

Wage Students

- Madeline Haas (BS, VSE)
- Sharmin Hossain (BS, VSE)
- Nicole Wells (PhD, Schar)

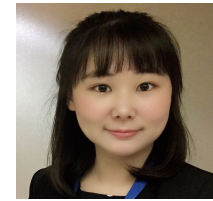
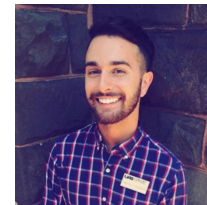
Student Researchers on Projects

- Ruddi Tamakloe (Compound Disasters)
- Hadi Ghayoomi Mohammadi (MASH)
- Beth Hosek (MITRE)

OSCAR RAs (Search underway)

- Events Research Assistant (co-supervised w/ Tourism and Events Mgt)
- Communications Research Assistant
- Community Resilience Research Assistant
- STAR-TIDES Research Assistant

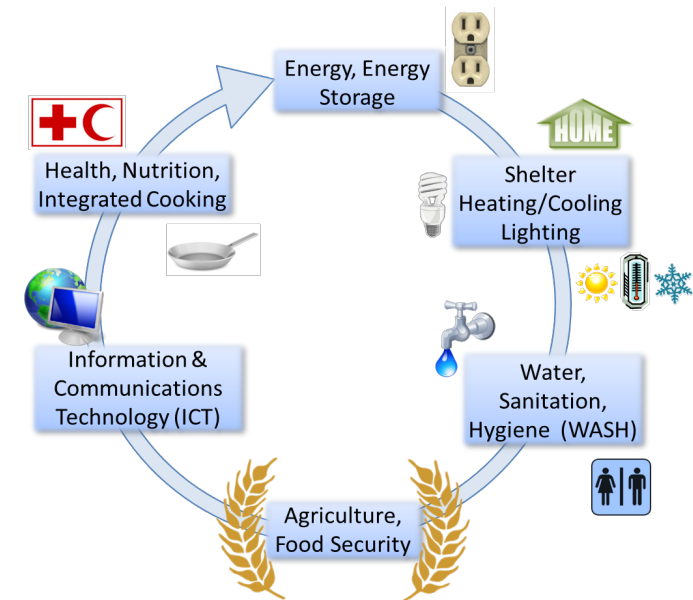
STAR-TIDES volunteers



Agenda



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- Plans



Introduction: C-RASC 5-Year Goals



- **Goal 1: Build Trans-disciplinary Research and Teaching Capacity**
 - Catalyze and grow committed trans-disciplinary research and teaching team to develop plans that make a difference for diverse communities, engage with stakeholders, and teach
 - Provide sustainable funding and effective facilities
 - Train a generation of trans-disciplinary, community-engaged researchers, teachers and practitioners
 - Publish results
- **Goal 2: Develop Multiscale Research Framework**
 - Refine coordinating framework into a widely accepted standard model of community-led resilience initiatives in diverse environments
- **Goal 3: Support Plan Generation**
 - Help to develop plans for community-led, bottom-up, locally focused resilience solutions in diverse environments with specific, measurable, achievable, relevant and timely milestones
- **Goal 4: Support Solution Execution**
 - Provide evidence-based support to increase local capacity, develop local leadership, produce results, and build a trusted network of stakeholders to carry out further projects

Year 1 Targets Summary



- Target: 3 projects underway, \$750K in sponsored research
 - 8 projects underway, ~\$3.67M in total awards funded
 - Reported expenditures through June 30, 2020: ~212K
 - 4 proposals pending, \$5.1M, 6 proposals declined
- Target: 2 cumulative publications
 - Peer-reviewed articles (accepted/published): 4
 - Peer-reviewed articles (submitted/under review): 2
 - Books/chapters: 3
 - Op-eds/Magazine articles: 3
 - Technical reports/Conference Papers: 6
- Target: 5 GMU courses using C-RASC concepts
 - [not formally tracked yet; Goal for Year 2]
- Target: 1 external partnerships formed
 - Formal partnership/MOU with Global MapAid, Arba Minch University, Ateneo University

Accomplishments – Center Infrastructure



- Organizational Development
 - Held strategic planning retreat 10/23/2019
 - Hired Assistant Director for Research Operations 05/01/2020
 - Held leadership retreat 07/17/2020
 - Development and approval of C-RASC governance arrangements, bylaws
 - Should better support leadership in grant seeking
 - Hired STAR-TIDES Research Analyst
 - Hired 2 transdisciplinary graduate research fellows (1 PhD, 1 MPA)
 - Monthly leadership team meetings
- Website
 - Live Site March 2020, continuing development
- New member outreach
 - 18 new members invited
 - Core/Affiliate categories created

Accomplishments – Collaborations



- Continuing to establish connections / collaborations across Mason (e.g. ISE / Office of Sustainability)
 - Discussions about ISE panels, follow-on workshops
 - Meetings with Greg Farley, engagement with climate action plan
- Working to establish international connections
 - E.g. – Keio University (Japan), Ateneo University (Philippines), Arba Minch University (Ethiopia), Maseno University (Kenya)
- Outreach to Virginia State and Northern Virginia Government organizations



Accomplishments – Funded Resilience Research (1 of 2)



- Support to Public School Security Simulation Experiment (Laskey, Bannan, Dailey)
 - MITRE / DHS, \$100K: Oct 2019-May 2020
 - Investigators: Laskey (VSE/C-RASC), Bannan (CAHMP), Dailey (CEHD)
- CIP and BIO Support for the HDAIC for Quanterion Solutions, Inc.,
 - Department of Defense., \$26,509: Oct 2019 to Sep 2020.
 - Investigators: Thornton, Kauzlarich (Schar)
- Cyber-Disaster Resilience: Assessment Framework for Cyber Impacts During Natural Disasters
 - VRIC / Commonwealth Cyber Initiative, \$150K: January 2020-May 2021
 - Investigators: Laskey, Cobb (Carter), Klimoski (Business), Thornton (Schar), Wells (VSE), Green (Marymount)
- NSF REU: Preparing the Next Generation of Scholars through GIS and Citizen Science (Marine Debris/Flood Vulnerability)
 - NSF subaward, \$40,202: May 2021-April 2024
 - Investigators: Torres (C-RASC), Hawthorne (PI, UCF)



Accomplishments – Funded Resilience Research (2 of 2)

- Puerto Rico Business Resilience Training Course
 - Puerto Rico Science Technology Trust, \$30K: May-Jul 2020
 - Investigators: Wells, Auffret (Business)
- RAPID: A Portal to Support Models for Assessing Strategies for Hospitals in the COVID-19 and other Pandemics - MASH-Pandemics
 - National Science Foundation, \$200,000: May 2020-Apr 2021
 - Principal Investigator: Elise Miller-Hooks (VSE)
 - Link to portal: <https://mash-pandemics.vse.gmu.edu>
- NNA Track 1: Arctic impacts and reverberations of expanding global maritime trade routes
 - National Science Foundation, \$3,000,000: Aug 2019-Jul 2024
 - Investigators: Miller-Hooks (PI-VSE), Cobb (Carter)
- Anticipated: Severe Impact Resilience: Framework for Adaptive Compound Threats
 - SERDP (Strategic Environmental R&D Program) grant RC20-C1-1138, \$122K to Mason in 2020-21; Approved for funding and moving through contracting
 - Investigators: Co-PI Laskey (C-RASC), PI: Dr. Imes Chiu, Army Corps of Engineers

Accomplishments – Submitted Proposals (1 of 2)



- National Capital Region CoPe Hub: Environmental Change Impacts on Community Flood Risk and Resilience (submitted Sep 2020)
 - NSF Coastlines and People; **\$5 million** for 5 years
 - Collaboration with UMD, UDC, DC Water, Noman Cole, AlexRenew, Potomac Riverkeeper, Neighborhood Associates; PI De Mutsert with Torres, Korostelina
- Energy and Society Local Government Initiative (submitted Aug 2020)
 - Oak Hill Foundation **\$99,461** for 2 years
 - PI: Thornton
- Secure Cloud Architecture Accelerating Civic Resilience (Planning Grant Submitted Aug 2020)
 - NSF CIVIC Innovation Challenge; Collaboration with Syracuse, SUNY, others
 - Investigators: McKnight (PI - Syracuse), Laskey, Wells, others
- Adaptable Resilience Ecosystem (ARE) (planning grant submitted Aug 2020)
 - NSF CIVIC Innovation Challenge; Collaboration with Adaptable Security, others
 - Investigators: Lan Jensen (PI - Adaptable Security), Laskey, Wells, others
- Sustainable Irrigation Knowledge Center, Arba Minch University (submitted Sep 2020)
 - Meridian Institute; Led by Global MapAid with Arba Minch University
 - Investigators: Laskey, Purohit, Houser, Gewa

Accomplishments – Submitted Proposals (2 of 2)



- 6 other proposals submitted, not awarded
 - Data.org Inclusive Growth and Recovery Challenge, MODL
 - Accelerating R2 Networks
 - GO Virginia COVID-19 data synthesis
 - Smart, Connected and Resilient Communities (SCoReCom)
 - NSF SCC/Japan Science & Technology Collaborative Research Opportunity
SERDP Research to Improve Installation Infrastructure Resiliency Processes
Systems, and Tools
 - NSF National Artificial Intelligence (AI) Research Institutes



Accomplishments – Ongoing Research



- Synchronizing Stovepipes White Paper (Wells)
- Local Government Resilience and Sustainability Practices (Dolan)
- Modeling Optimal Borehole Locations (MODL) (Laskey with Wells, Sokolov, Houser, Purohit with Arba Minch University, Global MapAid)
- Theories of resilience and links to NIST, ISO, and other resilience reference standards (Wells)
- Food, Energy and Water solutions for rural and low-income communities in Virginia (Gewa)
- Student Nutrition Impacts of COVID-19 (Gewa)
- Compounding Risks in a Pandemic for Precarious and Vulnerable Population (Cobb)

Accomplishments – Events and Outreach



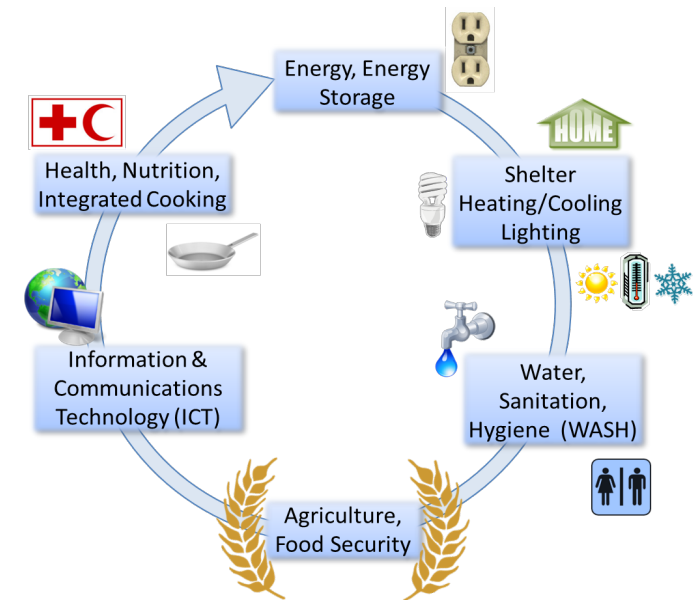
- Annual tech demo of STAR-TIDES global knowledge sharing network – held at GMU (9/30/2019 – 10/2/2019) and Pentagon Center Court (10/3/2019-10/4/2019)
- Symposium on Design Leadership for Resilience – held at GMU on 11/13/2019 in partnership with IBI Group
- C-RASC Seminars:
 - 6 Brown Bag Seminars, ~75 attendees
 - 5 Webinars, ~190 attendees
- Talks and Appearances:
 - Webinars/Seminars: 5
 - Emerald Planet TV Appearances: 12
 - Podcasts: 2
 - Keynotes: 1



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Plans – Proposal Development



- NSF/NIST - Mid-Atlantic Multi-Hazard (Wind and Flood) Electrical Grid Resilience Strategies, \$300k (Houser, et al.)
- NOAA - Disentangling Decision Networks to Inform Voluntary Buyout Programs Addressing Coastal Inundation, \$300k (Torres)
- USAID - Mapping optimal locations for shallow boreholes in Ethiopia, \$200k-\$1.5 million (Laskey, et al.)
- NSF Focused CoPe: Addressing the Risk of Marine Debris Resulting from the Built Environment of the Urban Coast under a Changing Hazard Spectrum, \$5 million (Torres et al – sub to ODU)
- NSF National Artificial Intelligence (AI) Research Institutes \$16-20 million (Di, et al.)
- NSF Growing Convergence Research, \$1.2-\$3 million (TBD)
- Wastewater sampling for COVID-19

Plans – Center Development



Personnel

- OSCAR students: Communications, events, STAR-TIDES
- Graduate Research Fellows

Community & Team Building

- Student engagement
- Seminars, happy hours
- Revisit committees/subgroups

Research Collaboration and Development

- Workshops/Brainstorming
- Transdisciplinary Proposal Mentoring Program

Plans – Events



- Oct 2020 – Mason Energy Forum, Threats and Opportunities: Using Data and Technology to Protect Grid Resilience
 - Part of Arlington Forward 2020 Series
- Oct 20-21, 2020 – STAR-TIDES 14th Annual Tech Demo going fully virtual
- Dec 2020 – International Association of Emergency Managers Symposium
- Fall 2020 – Panel talk in collaboration with ISE, plus follow-on research collaboration workshop in Spring 2021
- TBD – Workshop on Food Security with Alfa8
- TBD – Workshop on resilience models

Plans – Educational Initiatives

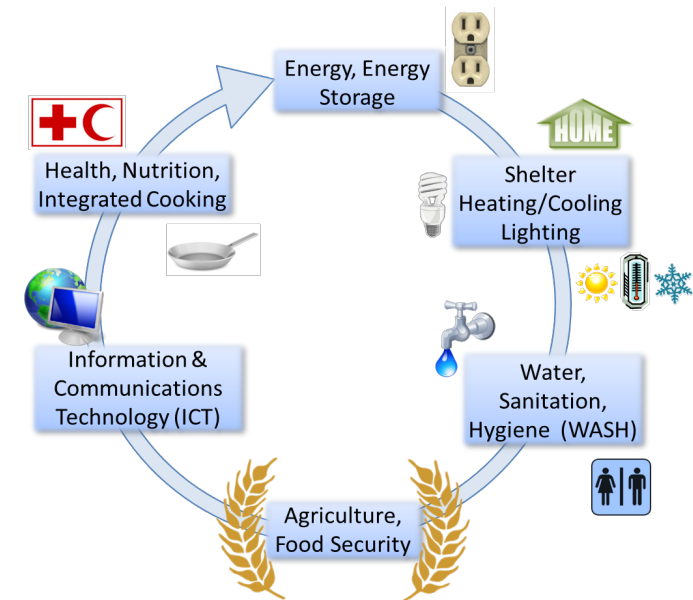
- Minor in Climate Action
- Resilience Graduate Certificate
- Repurpose Puerto Rico course materials for other courses on business resilience
- Development of teaching materials related to case studies, STAR-TIDES
- Engage with STEM education initiatives in Northern Virginia, such as Thomas Jefferson HS and NVCC (On hold)



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**Thank you.
Questions?**

