

Resilient Adaptive Climate Technology



reACT ThinkTank & Living Lab

2020-2021 Annual Report



Photo courtesy of Dennis Schroeder, US Department of Energy Solar Decathlon.



May 2021



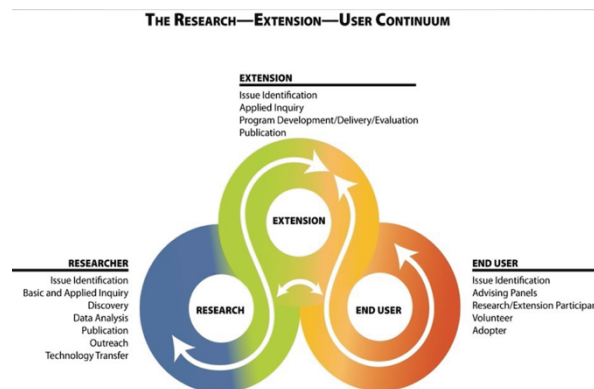
Land Acknowledgement: UMD

At the University of Maryland, we believe it is important to create dialogue to honor those that have been historically and systemically disenfranchised. So, we acknowledge the truth that is often buried: We are on the ancestral lands of the Piscataway People, who were among the first in the Western Hemisphere. We are on indigenous land that was stolen from the Piscataway People by European colonists. We pay respects to Piscataway elders and ancestors. Please take a moment to consider the many legacies of violence, displacement, migration, and settlement that bring us together here today.

reACT ThinkTank Meetings: LAND ACKNOWLEDGEMENT

Executive Summary

The founding five academic units (Engineering, Architecture, Libraries, Agriculture & Natural Resources, and Education) have agreed to advance beyond the already remarkable accomplishments of Team Maryland’s successes over the past two decades of transdisciplinary competition in the United States Department of Energy Solar Decathlon (SD). We intend to leverage our internationally recognized success into an on-campus Resilient Adaptive Climate Technology Living Laboratory & ThinkTank, a site for deep integration across disciplines as experts from different areas pursue common research challenges, and increasingly intermingle and integrate their knowledge, theories, methods, data, research communities and languages with new frameworks, paradigms or even disciplines formed from sustained interactions across multiple communities. We intend to extend the knowledge, expertise, and information to various stakeholders throughout the state of Maryland and beyond through various UMD outreach services, not the least of which is the University of Maryland Extension Service.



Presentation Slide created by Bill Hubbard for a presentation to the Maryland Commission on Indian Affairs

As a Land Grant Institution, we have a fundamental racially unjust history with the BIPOC community. President Daryll Pines has recognized that “current national and world events present unprecedented challenges, but also provide a meaningful chance to investigate today’s issues together and explore new and better paths forward.” The social unrest that has followed the deaths of George Floyd, Ahmaud Arbery, and Breonna Taylor is now

demanding a coherent response befitting the majesty of land-grant universities. We believe the time is now to recognize and recompensate the transgressions committed against Native American tribes in the building of the land-grant universities. We have adopted the land acknowledgment above to open our meetings and public documents to raise awareness of this history. However, contrition without restitution rings hollow over time. Moreover, most of the founders of our university were slaveholders, thus our institution's founding is stained by the profits from the exploitation of African labor in bondage which demands an accounting. We also need to reckon with the implications of legal racial segregation that led to the establishment of 1890 land-grant universities, our sister HCBU institutions. Among other inequities, 1862 land-grants always have been funded more generously than 1890 land-grants. We strive to look for opportunities to initiate collaborative research and community engagement activities with our sister institutions. We embrace social, racial, environmental, and energy justice in our activities.

In this Annual Report we present our activities in the following 15 sections and one Appendix. Brief summaries of achievements in each area are provided here.

- I. History & Origins
SD2017; SDME2020; Pandemic
- II. Grants, Funded Research, and Sponsored Agreements
Awarded: \$627.5K
Funding Sources: School of Architecture, Planning, & Preservation; Sustainability Grants; Student Facility Fund; VentureWell
Pending: \$3.935M
Funding Sources: NSF Advancing Informal STEM Learning; DOE Connected Communities FOA; Chesapeake Bay Foundation Green Streets; PGC Redevelopment Authority
- III. Reconstruction of original sd2017 competition winner, reACT
Funding Sources; Phased Construction; Living Systems OER; Coursework
- IV. Student Engagement
DOE Solar District Cup; Native Youth Fellowship; Coursework & Curriculum planning
- V. Climate Action Leadership
Consultation contract with PGC Redevelopment Authority
- VI. Native American Workgroup/ThinkTank/Task Force
Access and equity issues audit, Native American barriers, K-12 to higher education
- VII. Native Youth Fellowship
Fellows are Tribal or Native-descent high school (HS) students (junior or senior) interested in STEM careers
- VIII. Alumni Achievements related to ThinkTank
[Ripple](#), designed by a transdisciplinary Eco-Technology Design team led by sd2017 Decathlete Matt Lagomarsino
- IX. Professional Development
2021 Living Future Conference "Where Climate, Health, and Equity in the Built Environment Meet" which focused on inclusion and equity in the design and renewable energy communities.
- X. Open Scholarly Communications
Four new communities/collections; Three new items
- XI. Media Coverage
16 news articles; five of which are in external sources

XII. Expanded ThinkTank Membership in 2020-2021

Began with 16 sd2017 faculty, staff, students, and local tribe members. Ended 2021 with an additional 32 members. Current active membership is 48. Table includes: Name, Title, Unit, reACT TT Role

XIII. Opportunities for the Future

17 ThinkTank identified opportunities

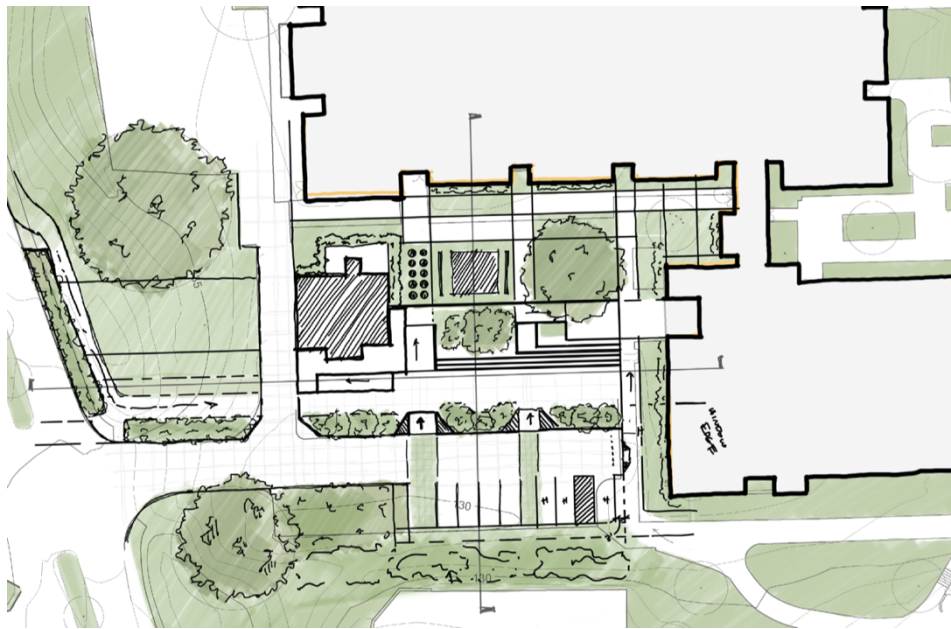
XIV. Resources & Campus Funding Needed for Continued Success

Six ThinkTank identified resource areas

XV. Acknowledgement & Gratitude

Thanks to all the many people who have made reACT ThinkTank and Living Lab a success

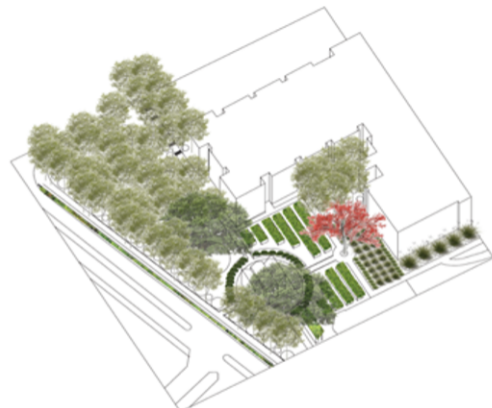
Appendix A. ThinkTank Mission Statement



Student work from ARCH460. Professor Ezban. Design by Benjamin Ripley



Ripple in situ



reACT in situ

I. History & Origins

The ThinkTank was created as a STEAM enterprise in April 2020 when campus closed due to the outbreak of COVID-19 and participation in the Solar Decathlon Middle East was cancelled. The group of faculty, students, alumni, industrial partners, and tribal community members were pleased that the University encouraged us to continue meeting and continue moving forward reACT's reconstruction and adaptive reuse as the University's first Sustainability Living Laboratory. By July 2020, we created our mission statement (see in Appendix A) and set strategic goals for the upcoming academic year. We committed our decision-making practice to be based upon potential impact forward to Seven Generations. Now a year later, we wish to report on the success of our academic, research, and outreach endeavors.

II. Grants, Funded Research, and Sponsored Agreements (Awarded: \$627.5K; Pending: \$3.935M)

- a. Tara Burke, joins TT in Summer 2020, works with members to find and apply for funding opportunities [Lead: Tara Burke]
- b. VentureWell Curriculum Development & Entrepreneurship Grant: (Awarded: \$10K) [Leads: Ming Hu, Jana VanderGoot, Naomi Sachs, Paul Jacob Bueno de Mesquita]
- c. Sustainability grants (Awarded: \$167.5K)
- d. Student Facility Fund Grant (Awarded: \$100K)
- e. *Advancing Informal STEM Learning (NSF) Through Open Educational Resources* (Proposed: \$2.83M/5 years) [Lead: Angela Stoltz]
- f. Green Street Concept Grant (Chesapeake Bay Foundation) (\$5K) [Lead: Peter May]
- g. Connected Communities Award (DOE) *Forestville Neighborhood* [Project cost \$11.5M] (Proposed award: \$7M/4yrs; TT Subrecipient Proposed award: \$1.1M) [Lead: Patti Cossard]
- h. Consulting Agreement between Prince George's County and TT (Phase I of 3; Awarded \$150K) [Leads: Patti Cossard, Garth Rockcastle, Peter May]

III. Reconstruction of original SD2017 competition winner

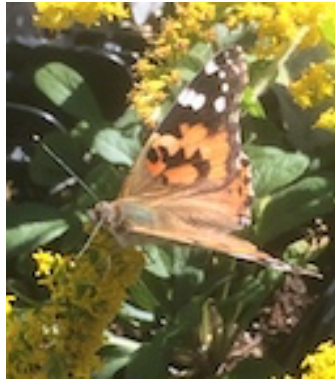
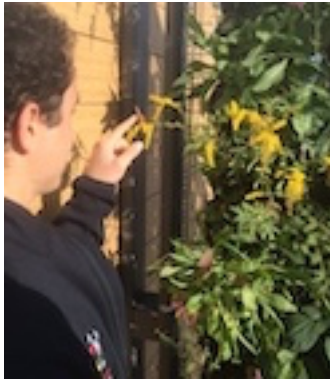
- a. Provost releases the FY2020 MAPP reconstruction funds (\$200K) [Lead: Interim Dean Don Linebaugh]
- b. Student Facility Fund released 2020 grant (\$100K) for reconstruction Phase I [Lead: Interim Dean Don Linebaugh]
- c. Approval process shepherded through Facilities Management throughout the academic year 2020-2021 [Lead: Interim Dean Don Linebaugh]
- d. Sustainability Fund Grants were awarded [2018 (awarded: \$47.5K), 2021 (Awarded: \$120K) [Leads: Ray Adomaitis, Patti Cossard]
- e. A three Phase reconstruction schedule was developed [Lead: Jana VanderGoot]
 - 1.) Phase I: Landing pad
 - 2.) Phase II: Building reconstruction
 - 3.) Phase III: Landscape & integration with the AgroEcology Corridor



Slide demonstrating the relationship of the campus built and natural systems.

"Transforming campus-wide education: The UMD AgroEcology Corridor" Presentation by Frank J. Coale, AGNR, June 2020

- d. Living Systems OER developed for informal STEAM learning audiences & reconstruction training [Leads: Zack Bishop, Matt Lagomarsino]

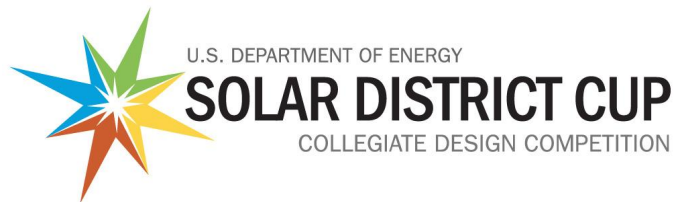


Matt Lagomarsino, 2017 Decathlete, points to pollinators that appeared within 24 hours of installing green wall, a part of the reACT Living Systems, demonstrating the regenerative value of plants indigenous to place

- e. DOE Connected Communities Subrecipient Grant includes funding for Living Lab [Lead: Patti Cossard]
- f. Fall and Spring courses created design work for the designs for the courtyard near reACT House [Leads: Michael Ezban, Jana VanderGoot, Naomi Sachs]

IV. Student Engagement

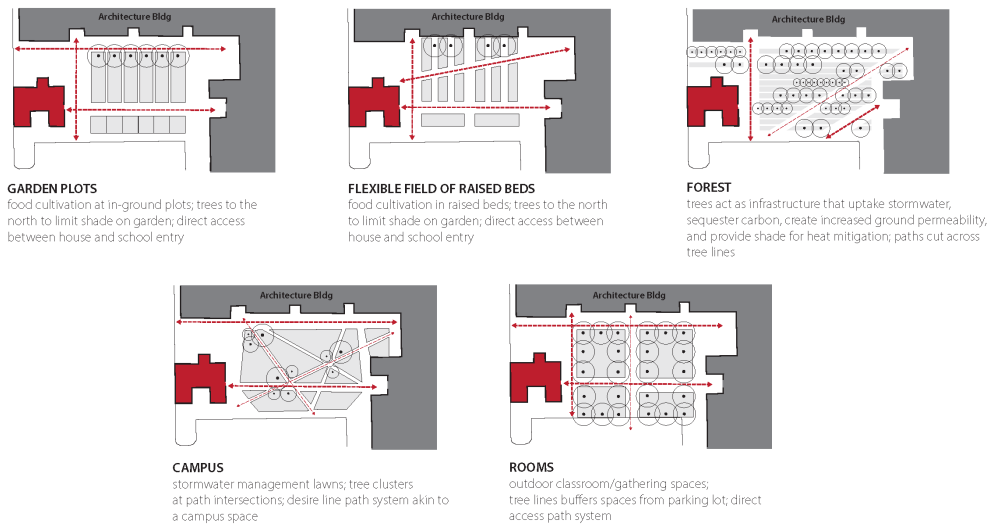
- a. DOE Solar District Cup, Class of 2021 [1/7 divisional finalists] [Lead: Bryan Quinn]



PV System Plan for College of Health Professionals & Sciences I, University of Central Florida Use Case

- b. Native Youth Fellowship [Lead: Kyle Harmon]
- c. Planning for 2021-2022 Integration into ARCH/LARC curriculum [Lead: Jana VanderGoot]
- d. Planning for 2021-2022 Integration into CEE/ARCH Construction Management Minor [Lead: Patti Cossard]
- e. Planning for 2021-2022 Integration into CPIM program [Lead: Patti Cossard]

f. Fall 2020 ARCH460 [Lead: Michael Ezban]



Five Parti's for the reACT landscape, Student work from Prof. Ezban's ARCH460 studio

g. Spring 2021 ARCH407/LARC240 [Lead: Jana VanderGoot with Naomi Sachs]



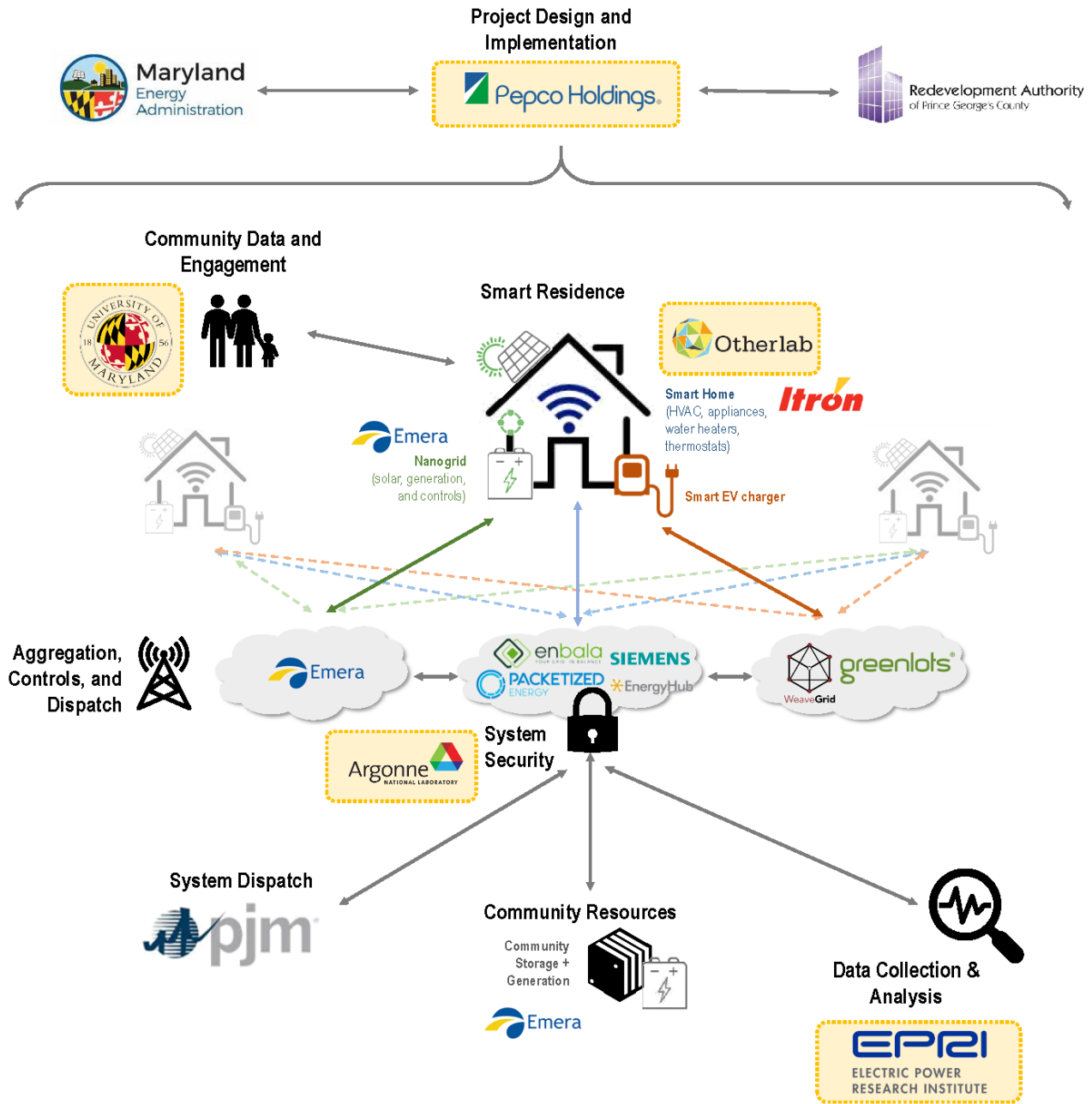
Student work from ARCH407. Designed by Almas Haider, ARCH Master's student & ThinkTank member

V. Climate Action Leadership

Since August 2020, ThinkTank has been working with Pepco Holding and the Prince George's County Redevelopment Office to transform 31.5 acres of undeveloped land in Prince George's County, Maryland (inside the Washington, D.C. beltway) into the Forestville Connected Community (FCC or Community), an efficient, smart, resilient, grid-connected, and sustainable community of 160 housing units. By advancing a model community that meets the housing needs of Prince George's County while simultaneously leveraging broad, efficient

electrification to demonstrate the environmental health and value proposition of a highly efficient, low carbon and sustainable energy future, the partners will represent a vital element in helping to create thriving, equitable communities, and a clean, resilient, and sustainable energy future.

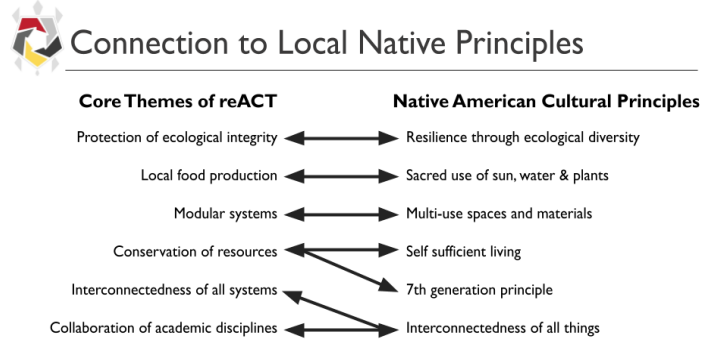
Figure 1: Simplified Schematic of the Proposed Forestville Connected Community



ThinkTank aims to make realistic and substantial climate positive impacts on the residential real estate development aspirations of Prince George's County, as it turns toward exploring and developing the foundations of its new Climate Action Plan. The ThinkTank will lead a process by which the partners will advance new forward-looking guidelines to embody the growing imperatives of climate change and environmental degradation. While this proposal pilots a process that aims to serve the immediate goals of the Forestville project, we hope it will lay the groundwork for a more generally applicable development process and standard for future County projects.

VI. Native American Workgroup/ThinkTank/Task Force

sd2017 reACT leadership team members (Angela Stoltz, Kyle Harmon, and Keith Colston) formed a Native American Workgroup/Think Tank/Task Force that has been auditing access and equity issues that create barriers to Native American representation, participation, and success in our educational systems across the state from K-12 to higher education (both students and staff). They have been meeting with units across campus and state organizers since October 2020.



Slide from Living Systems Module. 2021

Created through discussions and collaboration of Zack Bishop, Matt Lagomarsino, Kyle Harmon, Rico Newman, and Keith Colston

VII. Native Youth Fellowship

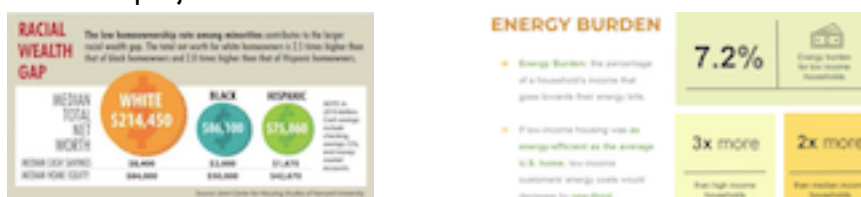
sd2017 Team Maryland reached out to regional tribal communities, this is a continuation of those relationship building efforts with native communities to forward social, economic, and environmental justice in commitment to the principles of seven-generation decision making. Fellows are Tribal or Native-descent high school (HS) student (junior or senior) interested in STEM careers. The opportunity is competing at the National level on a collegiate team. Experiential Learning: Engineering, Urban Planning, Sustainability, Environmental Justice action, Finance.

VIII. Alumni Achievements related to ThinkTank

[Ripple](#), designed by a transdisciplinary Eco-Technology Design team led by sd2017 Decathlete Matt Lagomarsino, was chosen as one of ten top designs in the [Land Art Generator Initiative \(LAGI\) 2020 Design Challenge](#). Ripple integrates electrochromic glass, a bioceramic dome (Geoship SPC), seed bank, solar photovoltaic, cisterns, drip irrigation, composting toilets, and native restoration plants to provide shelter, food, medicinal herbs and teas, habitat enhancement, water harvesting, 36 MWh/year of electricity, and 40,000 liters/year of harvested water.

IX. Professional Development

ThinkTank members, Patti Cossard, Garth Rockcastle, and Mike Binder attended the 2021 Living Future Conference "Where Climate, Health, and Equity in the Built Environment Meet" which focused on inclusion and equity in the design and renewable energy communities. The conference is part of the International Living Future Institute's (IFLI) educational mission. sd2017 reACT was design utilizing the standards of IFLI's Living Building Challenge. Going further than LEED, IFLI standards maximize positive impacts specific to the place, community, and culture of projects for the built environment.



Slides from the session: Diversity, Equity, and Inclusion in the Renewable Energy Future

X. Open Scholarly Communications

New Communities and Collections on the Digital Repository at the University of Maryland (DRUM)

Solar Decathlon Africa 2019: Team DarnaSol <http://hdl.handle.net/1903/25976>

Solar Decathlon Europe 2019: Team Tango <http://hdl.handle.net/1903/25975>

Solar Decathlon Middle East 2020: Team reACT REGENERATED <http://hdl.handle.net/1903/25974>

SDME2020: Final Report [PROJECT 2020 Solar Decathlon Middle East, reACT reGENERATED]
<http://hdl.handle.net/1903/27050>

Resilient Adaptive Climate Technology Living Lab & ThinkTank <http://hdl.handle.net/1903/2701>

Project Proposal: UFC District Use Case <http://hdl.handle.net/1903/27051>

U.S. Department of Energy Solar District Cup Collegiate Design Competition, Class of 2021, Team Maryland
<http://hdl.handle.net/1903/27052>

XI. Media Coverage

MAPP website/e-news, etc.

9.9.2021 [Green Team: New Interdisciplinary Curriculum Connects Students to Science Behind Sustainable Design](#)

10.20.2020 [UMD to Compete in U.S. DOE Solar District Cup](#)

1.19.2021 [UMD Makes U.S. DOE Solar District Cup Finals](#)

3.26.2021 [Rhythms of Nature Inspire Pilot Design Studio](#)

4.8.2021 [New Grant Funds Solar-Decathlon House's Next Chapter](#)

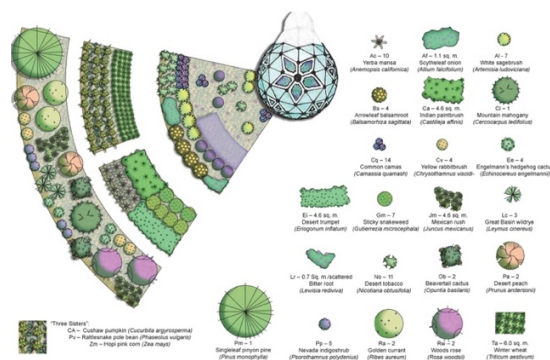
ENGR website/e-news, etc.

10.19.2020 [UMD to Compete in U.S. DOE Solar District Cup](#)

12.21.2020 [UMD Makes U.S. DOE Solar District Cup Finals](#)

AGNR website/e-news, etc.

4.22.2021 [The Ripples of Ripple: UMD Students and Alumni Sow the Seeds of Conscious Living as Winners of the LAGI 2020 International Design Challenge](#)



Ripple Plant Palette, created by Xiaojin Ren, LARC Master's student

Maryland Today

1.25.2021 [UMD Advances to Finals of Department of Energy's Solar District Cup](#)

4.2.2021 [Biowall Designs Break Down Divides](#)

4.7.2021 [Grants for Going Green](#)

Alumni in the News

Forbes. 3.3.2021 [Future of Burning Man Emerges At Fly Ranch, An Outrageous New World In The Black Rock Desert](#)

SURFACE. 3.8.2021 [At Long Last, Burning Man Is Building a Permanent City](#)

Architect News. 3.9.2021 [Burning Man plans a permanent, sustainable location](#)

INHABITAT. 3.19.2021 [Burning Man and LAGI unveil best eco-friendly proposals for Fly Ranch](#)

Imperial Valley News. 4.15.2021 [DOE Kicks Off Solar Decathlon Competition, Announces Richard King Award Winners](#)

XII. Expanded ThinkTank Membership

In 2020: began with 16 sd2017 faculty, staff, and students. Ended 2021 with an additional 32 members. Current active membership is 48.

a. ORIGINAL Membership:

Name	Title	Unit	reACT TT Role
Patti Cossard	Librarian III	LIBR (A&RS)	Director; Executive Committee; Information Manager; Forestville; DOE PI; Advancing Informal Stem Learning co-PI; CBT co-PI; 2021 Sustainability Grant PI; Experiential Learning; Restorative Justice & Practices
Garth Rockcastle	Emeritus	MAPP (ARCH)	Co-director; Executive Committee; Architect; Forestville co-PI; Advancing Informal Stem Learning co-PI; 2021 Sustainability Grant co-PI; Experiential Learning; Restorative Justice & Practices; SDEI9 (With MOME, Budapest Hungary)
Ray Adomaitis	Professor	ENGR (ISI)	Executive Committee; SMART Systems; Solar Technology Engineer; Forestville; 2018 Sustainability Grant PI; SDAI9 (Team DarnaSol)
Yunho Hwang	Research Professor	ENGR (ME)	Executive Committee; HVAC; Forestville; DOE co-PI
Bryan Quinn	Technical Director	ENGR (ECE)	Executive Committee; Solar Engineer; Experiential Learning, Forestville; DOE co-PI; Advancing Informal Learning; Restorative Justice
Angela Stoltz	Asst. Clinical Professor	EDUC (TLPL)	Executive Committee; STEM Education and STEM teacher preparation; tribal relations; Advancing Informal Stem Learning PI; Decolonizing Higher Education
Peter May	Asst. Research Professor	AGNR (ENST/LARC)	Executive Committee; Living Systems; Water Management, Forestville; DOE co-PI, CBT PI; Experiential Learning; Advancing Informal Stem Learning; Environmental Justice
Hooman Koliji	Asso. Clinical Professor	MAPP (ARCH)	Executive Committee; Landscape; Hydroponics; Advancing Informal Stem Learning; Living System Technology
Kyle Harmon	Teacher, Meade Senior High School	Nanticoke Nation; Anne Arundel County Public	Tribal relations; Native Youth Fellowship; Secondary Education; Living Systems OER; Advancing Informal Stem Learning co-PI; Restorative Justice & Practices
Natosha Carmine	Chief	Nanticoke Nation	Tribal relations: Restorative Justice & Practices
Keith Colston	Exec. Director	MD Comm on Indian Affairs	Tribal and State relations; Living Systems OER; Restorative Justice & Practices
Alla Elmahadi	Alumna	MAPP	sd2017 Decathlete

Matt Lagomasino	Alumnus	AGNR	sd2017 Decathlete; Living Systems OER; RIPPLE Lead PI; Restorative Justice & Practices
Zack Bishop	Alumnus	BSOS	sd2017 Decathlete; Living Systems OER; RIPPLE; Experiential Learning; Advancing Informal Stem Learning; Restorative Justice & Practices
Tim Owoeye	Student	ENGR	Sd2017 Decathlete; Experiential Learning
Chris Hinojosa	Communications Director	MAPP	Communications/Media; Restorative Justice & Practices
Roger Colliston	Proprietor	Beracah Homes	Reconstruction

b. EXPANDED Membership

Name	Title	Unit	reACT TT Role
Bill Hubbard	Asst. Director Extension Program	AGNR (EXTE)	Executive Committee; Land Grant Mission; Extension Services; Public Education; Advancing Informal Stem Learning co-PI; Forestville; DOE co-PI; Restorative Justice & Practices
Tara Burke	Research Development	MAPP	Funding opportunities; research development: Smart Connected Communities
Ming Hu	Asso. Professor	MAPP (ARCH)	Architectural Technology; Living Lab Curriculum; VentureWell PI
Jana VanderGoot	Asso. Professor	MAPP (ARCH)	Executive Committee; Forestville; reACT reconstruction; Living Lab Curriculum; Landscape; Carbon Sequestration; VentureWell co-PI; Restorative Justice & Practices
Naomi Sachs	Asst. Professor	ANGR (LARC)	Landscape Architecture; Living Lab Curriculum; VentureWell co-PI
Paul Jacob Bueno de Mesquita	Post Doc	PHTH (MIAEH)	VentureWell co-PI
Rico Newman	Elder	Piscataway Tribe	Tribal Relations; Ethnobotany; Living Systems OER; Restorative Justice & Practices; Advancing Informal Stem Learning
Hosam Fathy	Professor	ENGR (MENG)	Solar Storage Systems; Mechanical Engineering; District Grids; Experiential Learning
Amro Hassanein	Asst. Research Scientist	ANGR (ENST)	Advancing Informal Stem Learning; Restorative Justice & Practices
Amy Green	Asst. Clinical Professor	EDUC (TLPL)	Advancing Informal Stem Learning; STEM Education and STEM Teacher Preparation; Restorative Justice & Practices
Matthew Aruch	Director	EDUC (STS)	Advancing Informal Stem Learning; Restorative Justice & Practices; Living Lab Curriculum
Annie Rappaport	Graduate Student	EDUC (International Education)	Primary and Secondary Education; Restorative Justice & Practices

Michael Ezban	Asst. Clinical Professor	MAPP (ARCH)	Design; Landscape Architecture; Restorative Justice & Practices; Forestville; DOE
Michael Hindle	Proprietor	INDRALogic LLC, Passive to Positive	Passive design consulting, Energy modeling, life-cycle analysis, and coordinating with living systems and building site integration; Building Standards; DOE sub-awardee; Forestville
Michael Binder	Asso. Clinical Professor	MAPP (ARCH)	Systems; Architectural Engineering; Experiential Learning; Living Lab Curriculum; Building Standards
Almas Haider	Graduate Student	MAPP (ARCH)	Restorative Justice & Practices; Design; Landscape; Architecture
Kelly Fleming	Proprietor	Green Mechanics, LLC	LEED SITES certified; Landscape Architecture; Environmental Justice; Forestville
Favour Nerrise	Undergraduate	ENGR (ECE)	District Cup Class of 2021
Jakob Brinkman	Undergraduate	ENGR (ENSG)	District Cup Class of 2021
Jonathan Yee	Undergraduate	ENGR (ECE)	District Cup Class of 2021
Pamela Mountain	Undergraduate	ENGR (MENG)	District Cup Class of 2021
Cade Stanfield	Undergraduate	CMNS (CHEM)	District Cup Class of 2021
Tali Kirshenboin	Undergraduate	AGNR (LARC)	District Cup Class of 2021
Yasmin Molkara	Undergraduate	BUSS (ACCT)	District Cup Class of 2021
Joey Moore	Undergraduate	ENGR	District Cup Class of 2021
Duong Le	Undergraduate	MAPP (ARCH)	District Cup Class of 2021
Lynelle Payton	Undergraduate	ENGR	District Cup Class of 2021
Victor Olufade	Undergraduate	ENGR	District Cup Class of 2021
Aita Rukh-Kamaa	Undergraduate	ENGR (CHEM)	District Cup Class of 2021
Tahirah Akbar-Williams	Education Librarian	LIBR	Advancing Informal Stem Learning; Restorative Justice & Practices
Li Gao	Doctoral Candidate	ENGR (ME)	Forestville
Babak Hamidzadeh	Computer Scientist	INFO	Forestville; DOE; Data Science; Information Management Systems



Student work from ARCH407. Designed by Almas Haider, ARCH Master's student & ThinkTank member

XIII. Opportunities for the Future

- a. Establish the Living Lab as a University-wide Center recognized by the Division of Research with funding for administrative and expert consulting assistance and research development.
- b. With students returning to campus in Fall 2021, recruiting students in the reconstruction of reACT will enlarge our capacity to impact Climate Action.
- c. AgroEcology Corridor
- d. Solar Decathlon Design, Build and District Cup competitions
- e. Federal contracts and center funding
- f. Collaborative relationship with Smithsonian National Museum of the American and Piscataway Park
- g. Decolonizing the Land Grant/Land Grab origins of UMD
- h. Licensing reACT DNA construction plans and manufactured housing contracts
- i. Including Passive House training into the Architecture/Construction Management curriculum
- j. Native Youth Fellowship, College Preparation, High School Service Programs
- k. Restorative Justice & Practices; moving from advocacy to action
- l. Open Education Resources (OER's)
- m. Corporate/Utility [power, water, data]/Institutional Partnerships Sponsorships
- n. Gifts-in-Kind for Living Lab
- o. Presentation on the creation of reACT to MAPP faculty
- p. Invite [Joseph Kunkle \(MAPP '09\)](#) to collaboration with the ThinkTank
- q. Recruit Data Scientist

XIV. Resources & Campus Funding Needed for Continued Success

- a. Administrative stipend for LL/TT Director; Funding for administrative and expert consulting assistance and research development
- b. Reconstruction Project Manager; Funding for DOE SD Competitions and Activities
- c. Funding for GAs; Stipends for undergraduates
- d. Budget for guest speakers, public events, and visitors
- e. Development assistance to cultivate a donor base (small honorarium for Native Youth Fellows)
- f. Corporate Partnerships developer



Student work from ARCH407. Elevation by Almas Haider, ARCH Master's student & ThinkTank member

XV. Acknowledgements and Gratitude

President & Provost

Darryll Pines
Ann Wylie

Deans

Donald Linebaugh
Robert Briber
Adriene Lim
Craig Beyroudy
Jennifer Rice

Associate Deans

Gary White
Gerritt Knapp
Jelena Srebric
D. Hakim Scott
Puneet Srivastava

Directors

Yelena Luckert
Clara Irazábal
Brian Kelly

Budget/Research Officers

Deqin Jane Zhu
Ann C. Legall
Erin Chen
Ingrid Farrell
Prince Hunter
Stephanie Swartz
Kristi Edgerton
Hana Kabashi
Valerie Foster

Communications

Melissa Andreychek
Maggie Haslam
Samantha Watters
Christopher Bender

Legal Counsel

Jen Gartner
Tracey Skinner

Facilities

Kristy Long
Kris Phillips
Hector Prieto

Colleagues

Adam Grant
PALS program
Mark Stewart
Terry Owen
Frank J Coale
Kim Fisher
Jennifer Cotting

NREL

Joe Simon

Pepco

Rob Stewart
Albert Phan
Uuganbayar Otgonbaatar
Lindsay North

PGCounty

Stephen Paul
Ernest Williams
Erica Bannerman

As well as
sd2017 TEAM reACT
LGE sponsor of the reACT VFRF system
Zehnder sponsor of reACT's ERV

Appendix A

University of Maryland Resilient Adaptive Climate Technology (reACT) ThinkTank (UMD-reACT TT)

MISSION, VISION, and GOALS

MISSION

The Tripartite Mission (Research, Teaching, and Public Service) for the University of Maryland's Resilient Adaptive Climate Technology (reACT) ThinkTank (UMD-reACT TT) is established to cultivate a convergence paradigm¹ in Environmental Sustainability and Justice. As a means of solving the vexing research problem of climate change, as well as, social, economic and environmental justice, particularly its complex relationship with the built environment and the affordable residential housing market, the ThinkTank's work will entail integrating knowledge, methods, and expertise from different disciplines and forming novel frameworks to catalyze scientific discovery and innovation.

The founding five academic units (Engineering, Architecture, Libraries, Agriculture & Natural Resources, and Education) have agreed to advance beyond the already remarkable accomplishments of Team Maryland's successes over the past two decades of transdisciplinary competition in the United States Department of Energy Solar Decathlon (DoE). We intend to leverage our internationally recognized success into an on-campus Resilient Adaptive Climate Technology Living Laboratory, a site for deep integration across disciplines as experts from different disciplines pursue common research challenges, and increasingly intermingle and integrate their knowledge, theories, methods, data, research communities and languages with new frameworks, paradigms or even disciplines formed from sustained interactions across multiple communities. We intend to extend the knowledge, expertise, and information to various stakeholders throughout the state of Maryland through various UMD outreach services such as University of Maryland Extension.

VISION

Employing a convergence science paradigm, the *UMD-reACT-TT* intentionally brings together intellectually diverse researchers, instructional faculty, and students to develop effective ways of communicating across disciplines by adopting common frameworks, language, and taxonomies, which, in turn, affords solving the socio-scientific problem of ecological sustainability and social justice, and, thereby, develop novel ways of framing research questions, and opening new research vistas.

Through our centralized location within the Living Laboratory, *UMD-reACT-TT* will become an internationally exceptional catalyst, inspiring and testing transdisciplinary innovations, making them accessible to teaching, learning and public service. As the single most collaborative teaching, research and public service program and facility of its kind at UMD that is dedicated to just environmental regenerative and sustainable systems, the leaders of this unique living lab will continue to expand the transdisciplinarity, diverse, and inclusive foundation from the original five founding units and Solar Decathlon-centered student teams to other adjacent academic disciplines and environmental justice projects.

Moreover, we believe it is essential for catalytic convergence that *reACT-TT* remains committed to social, economic, and environmental justice, especially integrating indigenous cultural and ecological principles of regenerative living with a co-evolved planet and natural world. As an 1862 land-grant University, UMD's existence,² indeed the whole land-grant system, was born from violent expropriation of tribal lands.³ Not only are Universities built *on* indigenous land, but they are built *with* tribal land. The leaders of *reACT-TT*, take a post-colonial stance and feel a moral imperative to attend to this history through working with local tribes, education

¹ <https://www.nsf.gov/od/oia/convergence/index.jsp>

² <https://www.landgrabu.org/universities>

³ <https://www.hcn.org/issues/52.4/indigenous-affairs-education-land-grab-universities>

and work-force development focused on indigenous youth, and educational collaborations with 1894 Historically Black Colleges and Universities (HCBUs) and 1994 Tribal College land-grant institutions.⁴

reACT (**r**esilient **A**daptive **C**limate **T**echnology)⁵ was the third consecutive Team Maryland Solar Decathlon medalist. It will be adaptively reused as the inaugural facility to attract convergence design experimentation and research, however, the ThinkTank will also network with Team Maryland's other medalists [LEAFHouse (sd2007) and WaterShed (sd2011)] to host research initiatives alongside *reACT*, as their respective owners on and off campus have agreed, to advance this larger tripartite agenda together. Core to networking the three labs is developing novel and iterative frameworks to eventuate scientific discovery and significant design innovation. Data will be collected by sensors prescribed by Solar Decathlon quantitative contests, as well as additional iterations of sensors for scientific data collection.

Along with the OECD International Energy Agency - Energy in Buildings and Communities' (IEA-EBC) Annex 74 Solar Decathlon Living Laboratories network⁶, ThinkTank members will build, curate, and contribute to data libraries built over time and with real life applications. Underpinning this work will be the idea that building the evidence for more sophisticated and detailed data gathering will better support the development of new intellectual property, expanding external partnerships (for support funding), and improve the likelihood of taking these innovations to market applications with industry partners. The ThinkTank is composed of UMD faculty, staff, and students, as well as local indigenous tribal members and builders. Thus, the Living Laboratory is intended to benefit the collaborative faculty, engaged students, and the people, economy, and environment of the State of Maryland.

GOALS

- 1) To **Manifest** the UMD's broad and deep commitments to Interdisciplinary in sustainability research with an on-campus community and Living Lab for students, faculty and visitors to visit and use.
- 2) To **Network and Integrate** past UMD international successes in this research and design frontier for global access and awareness and to leverage and highlight its accomplishments.
- 3) To **Seed and Spawn** future initiatives to experiment, test and verify new ideas through flexible adaptation to change and to accommodate diverse and ongoing experimentation.
- 4) To **Continue and Expand** a diverse and inclusive student team for the various ThinkTank projects using the Living Lab with a focus on economic, social, and environmental justice.



⁴ Which is made up of Tribal Colleges and have both Extension Departments as well as extension agents on tribal lands.

⁵ <http://2017.solarteam.org/>

⁶ <https://annex74.iea-ebc.org/>