List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

The following information regarding collaborators and other affiliations (COA) must be separately provided for each individual identified as senior project personnel. The COA information must be provided through use of this COA template.

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	McGlathery, Karen J.	University of Virginia	

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to disambiguate common names

2	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
R:	Berg, Peter	University of Virginia		

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T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Howarth, Robert W.	Cornell University	

T:	Aoki, Lillian	Cornell University	
T:	Cole, Luke	EPA	
T:	Gonzalez, Dana G.	VA Dept of Natural Resources	
T:	Holzer, Kimberly	Smithsonian Env. Research Center	
T:	Kerns, Kylor	University of Virginia	
T:	Lawson, Sarah	Randolph College	
T:	Mozdzer, Thomas	Bryn Mawr College	
T:	Muth, Meredith F.	NOAA	
T:	Oreska, Matthew	Knauss Fellow, US OMB	
T:	Reynolds, Laura	University of Florida	
	Thomsen, Mads	University of Canterbury, NZ	
T:	Tyler, A. Christina	University of Rochester	

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to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
C:	Al Haj, Alia	Boston University		2020
C:	Alber, Merryl	University of Georgia		2018
C:	Alexander, Clark	Skidaway Institute of Oceanography		2018
C:	Anderson, Iris	Virginia Institue of Marine Science		2018
C:	Arnold, Thomas	Dickenson College		2016
A:	Berg, Peter	University of Virginia		2018
A:	Berger, Amelie	University of Virginia		2019
C:	Bieri, Jill	The Nature Conservancy		2018
C:	Blum, Linda	University of Virginia		2018
A:	Carr, Joel	USGS		2018
C:	Christian, Robert	East Carolina University		2017
A:	D'Odorico, Paolo	UC - Berkeley		2017
A:	Duarte, Carlos	King Abdullah University of Science and Technology		2019
A:	Duffy, Emmett	Smithsonian Institution		2017
A:	Emery, Kyle	UC - Santa Barbara		2016
C:	Ewers Lewis, Carolyn	University of Virginia		2020
A:	Eyre, Bradley	Sothern Cross University		2019
A:	Fagherazzi, Sergio	Boston University		2018
C:	Fenster, Michael	Randolph Macon College		2015
A:	Fourqurean, James	Florida International Univerisity		2019
C:	Fuentes, Jose	Pennsylvania State University		2018
C:	Giblin, Anne	Marine Biological Lab		2018
C:	Gurbisz, Cassie	St. Mary's College		2017
C:	Johnston, Robert	Clark University		2018
A:	Kennedy, Hilary	Bangor University		2019
A:	Krause-Jensen Dorte	University of Aarhus		2019
A:	Lavery, Paul	University of Queensland		2019
A:	Long, Matthew	Woods Hole Oceanographic Inst		2016
A:	Lovelock, Catherine	Edith Cowan University		2019
C:	Kirwan, Matthew	Virginia Institue of Marine Science		2018
C:	Macko, Steven	University of Virginia		2018
A:	Macreadie, Peter	Deakin University		2019
A:	Maher, Damien	Sothern Cross University		2019

A:	Marriotti, Guilio	Louisiana State Univerisity		2018
A:	Megonigal, Pat	Smithsonian Environmental Research Center		2018
A:	Middelburg, Jack	Utrecht University		2019
A:	Moore, Laura	UNC		2018
C:	Needelman, Brian	University of Maryland		2018
A:	Orth, Robert	Virginia Institue of Marine Science		2019
A:	Pace, Michael	University of Virginia		2018
C:	Polsky, Colin	Florida Atlantic University		2018
C:	Porter, John	University of Virginia		2018
C:	Reidenbach, Matthew	University of Virginia		2018
A:	Rheuban, Jennifer	Woods Hole Oceanographic Inst		2014
A:	Sanderne, Victor	King Abdullah University of Science and Technology		2019
A:	Santos, I.	Southern Cross University		2019
A:	Serrano, Oscar	Edith Cowan University		2019
A:	Stachowicz, Jay	University of California - Davis		2017
A:	Waycott, Michelle	University fo Adelaide		2018
A:	Wiberg, Patricia	University of Virginia		2018
A:	Wilkenson, Grace	Iowa State University		2017
C:	Young, Don	Virginia Commonwealth University		2018
C:	Zinnert, Julie	Virginia Commonwealth University		2018

Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief

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to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active
B:	Carpenter, Steve	University of Wisconsin	Ecosystems	1/1/18
B:	Turner, Monica	University of Wisconsin	Ecosystems	1/1/18

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	Lakshmi, Venkataraman	University of South Carolina	12/31/2018
		University of Virginia	1/1/2019

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2	Name:	Organizational Affiliation	Optional (email, Department)	Last Active

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3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)

T:	Bolten, John	NASA Goddard Space Flight Center	Hydrological Sciences Branch
	Fang, Bin	University of Virginia	Engineering Systems and Environment
	Gujjaro, Lizbeth	BHP Billiton	
	Hong, Seungbum	National Ecology Institute, South Korea	Ecology
	Mladenova, Iliana	NASA Goddard Space Flight Center	Hydrological Sciences Branch
	Narayan, Ujjwal	Self-employed	
	Price, Jessica	Berry College	
G:	Wood, Eric	Princeton University	Civil and Environmental Engineering

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4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Ajami, Hoori	University of California, Riverside		
A:	Arumugam, Sankar	North Carolina State University		
C:	Bindlish, Rajat	NASA Goddard Space Flight Center		1/1/19
C:	Bolten. John	NASA Goddard Space Flight Center		1/1/19
A:	Brantley, Duke	University of South Carolina		
A:	Caers, Jeff	Stanford University		
A:	Cosh, Michael	US Department of Agriculture		
A:	Famiglietti, James	University of Saskachewan		
A:	Fayne, Jessica	University of California Los Angeles		
A:	Fiona Johnson	University of New South Wales		
A:	Flores, Alejandro	Boise State University		
A:	Gemitzi, Alexandra	University of Thrace		
A:	Getirana, Augusto	NASA Goddard Space Flight Center		
A:	Goodrich, David	United States Department of Agriculture		
A:	Hain, Christopher	NASA Marshall Space Flight Center		
A:	Harris, Jeff	Stanford University		
A:	Hashemi, Hossein	Lund University		
A:	House, Paul	George Mason University		
A:	Hubbard, Kenneth	Oklahoma State University		
A:	Huffaker, Raymond	University of Florida		
A:	Huffman, George	NASA Goddard Space Flight Center		
A:	Jackson, Thomas,	Retired US Department of Agriculture		
A:	Kalra, Ajay	Southern Illinois University		1/1/15
A:	Kirschbaum, Dalia	NASA Goddard Space Flight Center		
A:	Knapp, Camelia	Oklahoma State University		
A:	Knapp, James	Oklahoma State University		
A:	Knight, Rosemary	Stanford University		
A:	Koster, Randall	NASA Goddard Space Flight Center		
A:	Mazrooei, Amirhossein	North Carolina State University		
A:	Miller, P	NOAA		
A:	Mishra, Vimal	Indian Institute of Technology, Gandhinagar		
A:	Mohammed, Ibrahim	NASA Goddard Space Flight Center		
A:	Monhanty, Binayak	Texas A&M University		
A:	Nearing, Grey	University of Alabama		
C:	Nigam, Sumant	University of Maryland		1/1/19
A:	O'Neill Peggy	NASA Goddard Space Flight Center		

A:	Parinussa, Robert	European Space Agency		
A:	Peters-Lidard, Christa	NASA Goddard Space Flight Center		
A:	Reager, John	Jet Propulsion Laboratory		
A:	Rodell, Matthew	NASA Goddard Space Flight Center		
A:	Sen, Indra	Indian Institute of Technology, Kanpur		
A:	Sharma, Ashish	University of New South Wales		
A:	Skofronick-Jackson, Gail	NASA Goddard Space Flight Center		
A:	Spruce, Joseph	Self-employed		
A:	Sridhar, Venkataramana	Virginia Tech		
C:	Srinivasan, Raghavan	Texas A&M University		1/1/19
C:	Sullivan, Jessica	University of South Carolina Aiken		1/1/19
A:	Therell, Matthew	University of Alabama		
A:	Tootle, Glenn	University of Alabama		
C:	Torres, Raymond	University of South Carolina		1/1/19
A:	Walker, Jeff	Monash University		
A:	Willgoose, Garry	University of Newcastle		

must list the entire editorial board.

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5	Name:	Organizational Affiliation	Journal/Collection	Last Active
E:	Agnastou, Manos	University of Connecticut	Journal of Hydrology	1/1/19
E:	Borga, Marco	University of Padova	Journal of Hydrology	1/1/19
B:	Burbey, Thomas J.	Virginia Tech	Remote Sensing in Earth System Sci	1/1/19
B:	Chaussard, Estelle	State University of New York, Buffalo	Remote Sensing in Earth System Sci	1/1/19
B:	Chen, Jingyi	University of Texas	Remote Sensing in Earth System Sci	1/1/19
E:	Flury, Markus	Washington State University	Vadose Zone Journal	1/1/19
B:	Foortan, Ehsan	University of Cardiff	Remote Sensing in Earth System Sci	1/1/19
B:	Gasso, Santiago	NASA Goddard Space Flight Center	Remote Sensing in Earth System Sci	1/1/19
B:	Gonzales, Pablo	Univesity of Liverpool	Remote Sensing in Earth System Sci	1/1/19
B:	Hashemi, Hossien	Lund University	Remote Sensing in Earth System Sci	1/1/19
B:	Indu, J.	Indian Institute of Technology Bombay	Remote Sensing in Earth System Sci	1/1/19
B:	Jena, Babula	National Center for Antartic and Ocean Re	Remote Sensing in Earth System Sci	1/1/19
B:	Jepsen, Martin	University of Copenhgen	Remote Sensing in Earth System Sci	1/1/19
B:	Kachamba, Daud	Lilongwe University of Agriculture	Remote Sensing in Earth System Sci	1/1/19
B:	Long, Di	Tshingua University	Remote Sensing in Earth System Sci	1/1/19
B:	Matricardi, Eraldo	University of Brasilia	Remote Sensing in Earth System Sci	1/1/19
B:	Mishra, Vimal	Indian Institute of Technology Gandhinaga	Remote Sensing in Earth System Sci	1/1/19
B:	Nyadro, Ebenezer	Stennis Space Flight Center	Remote Sensing in Earth System Sci	1/1/19
B:	Payne, Vivienne	Jet Propulsion Laboratory	Remote Sensing in Earth System Sci	1/1/19
B:	Roy, Shovonial	University of Reading	Remote Sensing in Earth System Sci	1/1/19
B:	Ryu, Dongryeol	University of Melbourne	Remote Sensing in Earth System Sci	1/1/19
B:	Saraceno, Martin	Center for Atmospheres	Remote Sensing in Earth System Sci	1/1/19
B:	Scanlon, Bridget	University of Texas	Remote Sensing in Earth System Sci	1/1/19
B:	Schmullius, Christine	Friedrich-Schiller University	Remote Sensing in Earth System Sci	1/1/19
B:	Shi, Jiangcheng	Chinese Academy of Sciences	Remote Sensing in Earth System Sci	1/1/19
B:	Skole, David	Michigan State University	Remote Sensing in Earth System Sci	1/1/19
B:	Skoofronick-Jackson, Gail	NASA Headquarters	Remote Sensing in Earth System Sci	1/1/19
B:	Steele-Dunne, Susan	Delft University of Technology	Remote Sensing in Earth System Sci	1/1/19

B:	Takayabu, Yukari	University of Tokyo	Remote Sensing in Earth System Scie	1/1/19
B:	Tian-Kunze, Xiangshang	University of Hamburg	Remote Sensing in Earth System Scie	1/1/19
E:	Vereecken, Harry	Juelich	Vadose Zone Journal	1/1/19
E:	Young, Michael	University of Texas	Vadose Zone Journal	1/1/19

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1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Band, Lawrence E.	University of Virginia	current
		University of North Carolina	6/30/2017
		University of North Carolina (adjunct)	current

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to disambiguate common names

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G:	Orme, Antony	UCLA	Geography

T:	Zhu, Axing	University of Wisconsin	Geography
	Lammers, Richard	University of New Hampshire	
T:	Mackay, David S.	University of Buffalo	
T:	Fernandes, Richard A	Canada Centre for Remote Sensing	
T:	Tague, Christina L	UCSB	
	Zhu, Tongxin	University of Minnesota, Duluth	
	Creed, Irena F	University of Saskatchewan	
	Law, Neely L	Center for Watershed Protection	
	Tenenbaum, David	Lund University	
	Jackson, Laura	EPA	
	Shin, Daehyok	Australian Bureau of Meteorology	
	Lipscomb-Smith, Monica	Geospatial Intelligence Agency	
	Hwang, Taehee	University of Indiana	
	Kim, Yuri	University of Indiana	
	Duncan, Jon M	Penn State Unversity	
	Miles, Brian	State of Louisiana	
	Ran, Limei	EPA	

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to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Duncan, Jon M	Penn State University		1/1/15
A:	Welty, Claire	Univ. Maryland, Baltimore County		
A:	Kemper, John T	Univ. Maryland, Baltimore County		
	Miller, Andrew	University of Maryland, Baltimore County		
	Swan, Christopher	University of Maryland, Baltimore County		
	Bhaskar, Aditi	Colorado State University		
	Irwin, Elena	Ohio State University		
	Rosi, Emma	Cary Institute for Ecosystem Studies		
	Grove, Morgan	USFS		
	Baker, Matthew	University of Maryland, Baltimore County		
	Boone, Chris	Arizona State University		
	Pickett, Steward	Cary Institute for Ecosystem Studies		
	Groffman, Peter G	City University of New York		
	Scaife, Charles I	University of Virginia		
	Kim, Yuri	Indiana University		
	Ficklin, Darren L	Indiana University		
	Martin, Katherine L	NC State University		
	Hwang, Taehee	Indiana University		
	Vose, James M	USFS		
	Coulston, John W	USFS		
	Wear, David N	USFS		
	Miles, Brian	CGI		
	Ajami, Houri	UC Riverside		
	Sharma, Ashish	USNW		
	Marshall, Lucy	USNW		

	Johnson, FM	USNW		
	Evans, Jason P	USNW		
	Tuteja, Narendra K	Australia Bureau of Meteorology		
	Amirthanathan, GE	Australia Bureau of Meteorology		
	Boyce, Ross M	University of North Carolina		
	Reyes, Raquel	University of North Carolina		
	Tashie, Arik	University of North Carolina		
	Pavelskey, Tamlin	University of North Carolina		
	Matte, Michael	Mbarara University of Science and Technology		
	Ntaro, Moses	Mbarara University of Science and Technology		
	Mulogo, Edgar	Mbarara University of Science and Technology		
	Metlay, Joshua P	Harvard University		
	Siedner, Mark J	Harvard University		
	Yulong, Zhang	University of North Carolina		
	Song, Conghe	University of North Carolina		
	Sun, Ge	USFS		
	Li, Junxiang	East China Normal University		
	Ran, Limei	EPA		
	Pleim, John	EPA		
	Gilliam, Robert	EPA		
	Walker, John T	EPA		
	Binkowski, Francis S	University of North Carolina		
	Bari, Mohammed A	Australia Bureau of Meteorology		
	Hogrefe, Christian	EPA		
	Winston, Jennifer J	University of North Carolina		
	Emch, Michael	University of North Carolina		
	Meyer, Robert E	University of North Carolina		
	Langlois, Peter	Texas Department of Health		
	Weyer, Peter	University of Iowa		
	Mosley, Bridget	Arkansas Children's Hospital		
	Olshan, Andrew F	University of North Carolina		
	Luben, Thomas J	EPA		
	McNulty, Steven	USFS		
	Noormets, Asko	USFS		
	Zhang, Quanfa	Chinese Academy of Science		
	Zhang, Zhiqiang	Beijing Forestry University		
	Bettez, Neil D	Cary Institute for Ecosystem Studies		
	O'Neill-Dunne, Jarleth	University of Vermont		
	Kaushal, Sujay	University of Maryland		
	Belt, Ken T	USFS		
	Law, Neely	Center for Watershed Protection		
	Erhardt, Robert	Wake Forest University		
	Smith, Richard	University of North Carolina		
	Lopes, Brian	University of North Carolina		
	Bernhardt, Emily S	Duke University		
	Greaver, Tara L	EPA		
	Clark, Christopher M	EPA		
	Compton, Janet E	EPA		
	Vallano, D	EPA		
	Talhelm, AF	EPA		
	Weaver, CP	EPA		
	Baron, Jill S	USGS/CSU		
	Davidson, Eric	University of Maryland		
	Tague, CL	UCSB		

	Felker-Quinn, E	EPA		
	Lynch, JA	EPA		
	Herrick, JD	EPA		
	Liu, L	Chinese Academy of Science		
	Goodale, Christine L	Cornell University		
	Novak, KJ	EPA		
	Hauber, RA	EPA		
	Xiu, Aijun	University of North Carolina		
	Du, Fei	University of Wisconsin		
	Zhu, A-Xing	University of Wisconsin		
	Liu, Jing	University of Wisconsin		
	Webster, Jack R	Virginia Tech University		
	Li, Runkui	University of Chinese Academy of Science		
	Rui, Xiaping	University of Chinese Academy of Science		
	Liu, Junzhi	Nanjing Normal University		
	Song, Xianfeng	University of Chinese Academy of Science		
	Miniat, Chelcy	USFS		
	Bolstad, PV	University of Minnesota		
	Love, JP	University of Georgia		
	Ahalt, Stanley	University of North Carolina		
	Christopherson, Laura	University of North Carolina		
	Idaszak, Ray	University of North Carolina		
	Lenhardt, Chris	University of North Carolina		
	Minsker, Barbara	Southern Methodist University		
	Cheng, X	Chinese Academy of Science		
	Zhang, Kerong	Chinese Academy of Science		
	Haidari, B	University of Illinois		
	Castronova, Anthony	CUAHSI		
	Burt, Tim	Durham University		
	Dietrich, William E	UC Berkeley		
	Emanuel, Ryan E	NC State University		
	Singh, Nitin K	University of Vermont		
	Lee, Jong	University of Illinois		
	Urban, Dean	Duke University		
	Fay, John	Duke University		
	Olander, Lydia	Duke University		
	Characklis, Greg	University of North Carolina		
	Reed, Patrick	Cornell University		
	Garcia, Anna	USGS		
	Hoos, Anne	USGS		
	Blackwell, J	NC-DEQ		
	Smart, L	NCSU		
	Zhu, A-Xing	U Wisconsion		
	Daly, Nancy	NC-DEQ		
	Hales, TC	U Cardiff		
	Lovette, John P	University of North Carolina		
	Tarboton, David G	Utah State University		
	Goodall, Jon	University of Virginia		
	Ames, Daniel	Brigham Young University		
	Leonard, Lorne	Penn State University		
	Easton, Zachery	Virginia Tech University		
	Scavia, Don	University of Michigan		
	Alexander, Richard	USGS		
	Boomer, Kathy	The Nature Conservancy		

	Kleinman, Peter	USDA		
	Miller, Andrew	Univ. Maryland, Baltimore County		
	Yang, L.	Chinese Academy Science		
	Zhao, Y	Chinese Academy Science		
	Li, D.C.	Chinese Academy Science		
	Zhang, G.L.	Chinese Academy Science		
	Pizzuto, James	University of Delaware		
C:	Jackson, Rhett	University of Georgia		
C:	Clark, James C	Duke University		
C:	Gragson, Ted	University of Georgia		
C:	Frei, Allan	City University of New York		
C:	Maerz, John	University of Georgia		
C:	Pringle, Cathy	University of Georgia		
C:	Heynen, Nik	University of Georgia		

Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief

B: Editorial Board: List name(s) of editor-in-chief and journal in the past 24 months; and

E: Other co-Editors of journal or collections with whom the individual has directly interacted in the last 24 months.

to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active
B:	Tetzlaff, Doerthe	Potsdam Institute	Hydrological Processes	1/1/17
B:	McNamara, James	University of Idaho	Hydrological Processes	

The following information regarding collaborators and other affiliations (COA) must be separately provided for each individual identified as senior project personnel. The COA information must be provided through use of this COA template.

Please complete this template (e.g., Excel, Google Sheets, LibreOffice), save as .xlsx or .xls, and upload directly as a Fastlane Collaborators and Other Affiliations single copy doc. Do not upload .pdf.

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There are five separate categories of information which correspond to the five tables in the COA template:

COA template Table 1:
List the individual's last name, first name, middle initial, and organizational affiliation (including considered affiliation) in the last 12 months.

COA template Table 2:
List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

COA template Table 3:
List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:
- **The individual's Ph.D. advisors; and**
- **All of the individual's Ph.D. thesis advisees.**

COA template Table 4:
List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:
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- **Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.**

COA template Table 5:
List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief must list the entire editorial board.
- **Editorial Board: List name(s) of editor-in-chief and journal in the past 24 months; and**
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1 Note that graduate advisors are no longer required to be reported.
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List names as Last Name, First Name, Middle Initial. Additionally, provide email, organization, and department (optional)
Fixed column widths keep this sheet one page wide; if you cut and paste text, set font size at 10pt or smaller, and
To insert *n* blank rows, select *n* row numbers to move down, right click, and choose Insert from the menu.
You may fill-down (crtl-D) to mark a sequence of collaborators, or copy affiliations. Excel has arrows that enable sorting.
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"Last Active Date" and "Last Active" columns may be left blank for ongoing or current affiliations.

Table 1: List the individual's last name, first name, middle initial, and organizational affiliation (including considered affiliation) in the last 12 months.

1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Brown Wilson, Barbara	University of Virginia	

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
R:				

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and
T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Moore, Steven	University of Texas at Austin	

T:	Klosterwill, Kevan	University of Virginia	
T:	Diamond, Alissa	University of Virginia	
T:	Reyes-Sanches, Ariadna I.	University of Texas at Arlington	

Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

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C: Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.

to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Burnett, Camille	University of Kentucky		
A:	Claibourn, Michele	University of Virginia		
A:	Gough, Meghan	Virginia Commonwealth University		
C:	Jackson, Maria Rosario	Arizona State University		
C:	Matthew, Dayna	George Washington University		
C:	Mondschein, Andrew	University of Virginia		
C:	Norman, Marc	University of Michigan		
C:	Ogbu, Liz	Studio O		
A:	Walsh, Elizabeth	University of Colorado at Denver		
C:	Yates, Josh	Duke University		

Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief must list the entire editorial board.

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to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active
E:				
E:				

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COA template Table 4:
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- **Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.**

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Table 1: List the individual's last name, first name, middle initial, and organizational affiliation (including considered affiliation) in the last 12 months.

1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Korkmaz, Gizem	University of Virgina	Current
		Virginia Tech - Adjunct	Current
		Virginia Tech - Faculty	10/15/2018

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Organizational Affiliation	Optional (email, Department)	Last Active

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and

T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)

G:	Vega-Redondo, Fernando	Università Bocconi	
G:	Marathe, Achla	University of Virginia	
G:	Marathe, Madhav	University of Virginia	
P:	Keller, Sallie	University of Virginia	

Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

A: Co-authors on any book, article, report, abstract or paper with collaboration in the last 48 months (publication date may be later); and

C: Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.

to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Vega-Redondo, Fernando	Università Bocconi		
C:	Barrett, Christopher	University of Virginia		
A:	Marathe, Achla	University of Virginia		
A:	Marathe, Madhav	University of Virginia		
A:	Keller, Sallie	University of Virginia		
A:	Shipp, Stephanie	University of Virginia		
A:	Orr, Mark	University of Virginia		
A:	Schroeder, Aaron	University of Virginia		
A:	Goldstein, Joshua	University of Virginia		
A:	Lancaster, Vicki	University of Virginia		
A:	Pristavec, Teja	University of Virginia		
A:	Kuhlman, Christopher	University of Virginia		
A:	Vullikanti, Anil	University of Virginia		
C:	Swarup, Samarth	University of Virginia		
A:	Lewis, Brian	University of Virginia		
A:	Ravi, S.S.	University of Virginia		
C:	Wilson, Mandy	University of Virginia		
C:	Bhattacharya, Parantapa	University of Virginia		
C:	Sarangi, Sudipta	Virginia Tech		
A:	Montague, Read	Virginia Tech		
A:	Lohrenz, Terry	Virginia Tech		
A:	Ramakrishnan, Naren	Virginia Tech		
A:	Higdon, Dave	Virginia Tech		
A:	Pires, Bianica	Virginia Tech		
A:	Crandell, Ian	Virginia Tech		
A:	Goode, Brian	Virginia Tech		
C:	Zhang, Wenwen	Virginia Tech		
C:	Moody, James	Duke University		
C:	Lebiere, Christian	Carnegie Melon University		
C:	Gonzalez, Cleotilde	Carnegie Melon University		
C:	Read, Stephen	University of Southern California		
C:	Austerweil, Joe	University of Wisconsin		
C:	David, Plaut	Carnegie Melon University		
A:	Graif, Corina	Penn State University		
A:	Haran, Murali	Penn State University		

A:	Wilson, Alyson	North Carolina State University		
C:	Pinker, Steven	Harvard University		
A:	Contractor, Noshir	Northwestern University		
A:	Macy, Michael	Cornell University		
A:	Epstein, Joshua	New York University		
C:	Leskovec, Jure	Stanford University		
A:	Reese, Shane	Brigham Young University		
A:	Capra, Monica	Claremont Graduate University		
A:	Robbins, Carol	National Science Foundation		
C:	Anderson, Gary	National Science Foundation		
C:	Jankowski, John	National Science Foundation		
A:	Lakkaraju, Kiran	Sandia National Labs		

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to disambiguate common names

5	**Name:**	**Organizational Affiliation**	**Journal/Collection**	**Last Active**
E:	Alhajj, Reda	University of Calgary		
E:	Borner, Katy	Indiana University		

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	Culver, Teresa B	University of Virginia	

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Type of Relationship	Optional (email, Department)	Last Active
R:				

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and
T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Shoemaker, Christine A	National University of Singapore	

G:	Lion, Leonard	Cornell University, emeritus	
G:	Haith, Douglas	Cornell University, retired	
T:	Adaramola, Olufemi	CitiBank Nigeria	
T:	Dai, Hong	Bank of Communications	
T:	Aksoy, Aysegul	Middle Eastern Technical University	
T:	Chan Hilton, Amy B.	Indiana State University	
T:	Jia, Yanbing	St. Johns River WMD	
T:	Mobley, John T.	Shrimad Rajchandra Love & Care	
T:	Reis, Julia	Via Transit	
T:	Zell, Wesley	US Geological Survey	

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C: Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.

to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
C:	Kerkez, Branko	University of Michigan		
C:	Hathaway, Jonathan	University of Tennessee		
C:	Goodall, Jonathan L.	University of Virginia		
A:	Sanford, Ward E.	US Geological Survey		1/1/18
A:	Zell, Wesley O.	US Geological Survey		1/1/18
A:	Behl, Madhur	University of Virginia		1/1/19
C:	Debaere, Peter	University of Virginia		
C:	Small, Arthur	Unversity of Virginia		
C:	Shimshack, Jay	University of Virginia		
A:	Morsy, Mohamed M.	Dewberry		1/1/19
A:	Reis, Julia	Via Transit		12/1/16
A:	McCartney, Matthew P.	International Water Management Inst.		12/1/16
A:	Block, Paul J.	University of Wisconsin		12/1/16
A:	Bowes, Benjamin	University of Virginia		1/1/19
A:	Sadler, Jeffrey	US Geological Survey		1/1/18

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to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active
B:				
E:				

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1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Wiberg, Patricia L.	University of Virginia	

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Type of Relationship	Optional (email, Department)	Last Active
R:				

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and
T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Smith, J. Dungan	USGS, Retired	

T:	Harris, Courtney	Virginia Institute of Marine Science	
T:	Christiansen, Trine	Denmark, unsure of address	
T:	Sojka, Sarah (nee Lawson)	Randolf College	
T:	Zhu, Qinguang	University of Virginia	
T:	Barnes, Tyler	University of Virginia	

Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

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4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Carr, Joel A	U.S. Geological Survey		2018
A:	Fagherazzi, Sergio	Boston University		current
A:	Kirwan, Matthew	Virginia Institute of Marine Science		current
A:	Larson, Laurel	U.C. Berkeley		2018
A:	Nardin, William	University of Maryland, Horn Point Lab		2018
C:	Alber, Merryl	University of Georgia		current
C:	Alexander, Clark	University of Georgia		current
C:	Giblin, Anne	Marine Biological Lab		current
C:	Gurbisz, Cassie	St. Mary's College		2019
C:	Johnston, Robert	Clark University		current
C:	Polskey, Colin	Florida Atlantic University		current
A:	Castagno, Katherine A	WHOI		2018
A:	Jiménez-Robles, Alfonso M	University of Grenada		2018
A:	Fenster, Michael S	Randolf Macon College		2018
A:	Donnelly, Jeffrey P	Brown University		2018
A:	Aoki, Lillian	Cornell Univeristy		2020
A:	Christian, Robert	East Carolina University		2020
A:	Orth, Robert	Virginia Institute of Marine Science		2020
A:	Cahoon, Donald	U.S. Geological Survey		2020
A:	Al-Haj, Aila	Boston University		2020
A:	Besterman, Alice	Woods Hole Research Center		2020
A:	Wilcox, David	Virginia Institute of Marine Science		2020
C:	Bieri, Jill	The Nature Conservancy		current

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5	Name:	Organizational Affiliation	Journal/Collection	Last Active
B:	Carlson, Craig	UCSB	Annual Review of Marine Science	current
B:	Giovannoni, Stephen	Oregon State University	Annual Review of Marine Science	current

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1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Goldstein, Joshua	University of Virgina	Current
		Virginia Tech	10/15/2018

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2	Name:	Organizational Affiliation	Optional (email, Department)	Last Active

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3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)

G:	Haran, Murali	Pennsylvania State University	

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4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Bjornstad, Ottar			
C:	Chen, Daniel			
A:	Ferrari, Matthew			
C:	Hamall, Ken			
A:	Haran, Mural			
A:	Higdon, David			
A:	Keller, Sallie			
A:	Koehler, Art			
A:	Korkmaz, Gizem			
C:	Lancaster, Vicki			
A:	Liebhold, Andrew			
C:	Moflino, Emily			
A:	Park, Jaewoo			
A:	Pires, Bianica			
C:	Schroeder, Aaron			
C:	Shipp, Stephanie			
C:	Ratcliff, Nathaniel			
C:	Nair, Devika			
C:	Pristavec, Teja			

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	Claibourn, Michele P.	University of Virginia	Present

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3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Franklin, Charles H.	Marquette University Law School	

G:	Sapiro, Virginia	Boston University	
G:	Coleman, John	University of Wisconin-Madison	
G:	Mutz, Diana C.	University of Pennsylvania	
T:	Joseph, Kelli	Private sector	
T:	Pickell, Barsha	Cleveland State Community College	
T:	Culbert, Gar	California State University Los Angeles	
T:	Sack, Katelyn	Private sector	

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4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Leblang, David A.	University of Virginia		Ongoing
A:	Martin, Paul S.	University of Virginia		Ongoing
C:	Coleman, Rebecca A.	University of Virginia		Ongoing
C:	Wilson, Barbara Brown	University of Virginia		Ongoing
C:	Mondschein, Andrew	University of Virginia		Ongoing
C:	Goodall, Jon	University of Virginia		Ongoing
C:	Chen, Donna	University of Virginia		Ongoing
C:	Ragon, Jay Bart	University of Virginia		12/31/18

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	Andrews, Elizabeth A.	William & Mary Law School, VA Coastal Policy Center	

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2	Name:	Type of Relationship	Optional (email, Department)	Last Active
R:	Hartley, Troy	Business		

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3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	N/A		

T:			

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4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Luckenbach, Mark	VA Institute of Marine Science		
A:	Steinhilber, Emily	Old Dominion University		
A:	Foster, Morris	Old Dominion University		
A:	Covi, Michelle	Old Dominion University		
A:	Cobb, Tanya Denkla	University of VA	Institute for Environmental Negotiation	
A:	King, Angela	William & Mary Law School	VA Coastal Policy Center	
A:	Reiblich, Jesse	William & Mary Law School	VA Coastal Policy Center	
A:	Bilkovic, Donna	VA Institute of Marine Science		
A:	Mitchell, Molly	VA Institute of Marine Science		
A:	Herman, Julie	VA Institute of Marine Science		
A:	Mason, Pamela	VA Institute of Marine Science		
A:	Davis, Jenny	NOAA - Federal		
A:	Dixon, Rachel	Chesapeake Research Consortium	STAC Coordinator	
A:	Davis, Jana	Chesapeake Bay Trust		
A:	Tahvildari, Navid	Old Dominion University		
C:	Lawrence, Lewis	Middle Peninsula Planning District Commission		
C:	McKay, Laura	Virginia Coastal Zone Management Program		
C:	Moon, Shep	Virginia Coastal Zone Management Program		
C:	Mason, Pamela	VA Institute of Marine Science		
C:	Stiles, William	Wetlands Watch		
C:	Hershner, Carl	Virginia Institute of Marine Science		
C:	Stafford, Sarah	College of William & Mary		
C:	Hartley, Troy	Virginia Sea Grant		
C:	Luckenbach, Mark	Virginia Institute of Marine Science		
C:	Van Senten, Jonathon	Virginia Tech Aquaculture Research and Extension Center		
C:	Yusuf, Wie	Old Dominion University		
C:	Denckla-Cobb, Tanya	University of VA		

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1 Note that graduate advisors are no longer required to be reported.

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List names as Last Name, First Name, Middle Initial. Additionally, provide email, organization, and department (optional)
Fixed column widths keep this sheet one page wide; if you cut and paste text, set font size at 10pt or smaller, and
To insert *n* blank rows, select *n* row numbers to move down, right click, and choose Insert from the menu.
You may fill-down (crtl-D) to mark a sequence of collaborators, or copy affiliations. Excel has arrows that enable sorting.
For "Last Active Date" and "Last Active" columns dates are optional, but will help NSF staff easily determine which information remains relevant for reviewer selection.
"Last Active Date" and "Last Active" columns may be left blank for ongoing or current affiliations.

Table 1: List the individual's last name, first name, middle initial, and organizational affiliation in the last 12 months.

1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Yusuf, Juita-Elena (Wie)	Old Dominion University	

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Type of Relationship	Optional (email, Department)	Last Active
R:	Anuar, Khairul Azfi	Family	azfi@hotmail.com	

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and

T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Hackbart, Merl	University of Kentucky	Martin School of Public Policy & Administration
G:	Jennings, Edward T.	University of Kentucky	Martin School of Public Policy & Administration
G:	Garkovich, Lorraine	University of Kentucky	
G:	Fink III, Joseph L.	University of Kentucky	College of Pharmacy
G:	Talbert, Jeffery	University of Kentucky	College of Pharmacy
T:	Harris, Katharine Neill	Rice University	
T:	Hirano, Shawn	Virginia Beach Public Schools	
T:	Rawat, Pragati	Slippery Rock University	
T:	Kenter, Robert	Center for Policing Equity	
T:	Doolan, Kelly	City of Virginia Beach	
T:	Council, Donta	American University	
T:	Martinez, Brian	City of Poughkeepsie	

T:	Birungi, Patricia	Albertus Magnus College	
T:	Martin, Adale	City of Norfolk	
T:	Alfaqiri, Abdul	Old Dominion University	
T:	Hill, Saige	Old Dominion University	
T:	Smith, Mechelle	City of Norfolk	

Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

A: Co-authors on any book, article, report, abstract or paper with collaboration in the last 48 months (publication date may be later); and

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to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Akerlof, Karen	George Mason University		
C:	Allen, Tom	Old Dominion University	Dept. of Geography & Political Science	
C:	Andrews, Elizabeth	Virginia Coastal Policy Center		
C:	Andrews, Mason	Hampton University		
A:	Anuar, Khairul A	Old Dominion University		
C:	Becker, Steven M.	Old Dominion University		
C:	Behr, Joshua	Old Dominion University		
C:	Bilkovic, Donna M	Virginia Institute of Marine Science		
C:	Bukvic, AnaMaria	Virginia Tech		
C:	Cetin, Mecit	Old Dominion University		
C:	Carter, Sarah	USGS		
C:	Chambers, Randy	William & Mary		
A:	Chapman, David	Old Dominion University		
A:	Considine, Carol	Old Dominion University		
C:	Crowell, Bill	North Carolina Dept of Environment and Natural Resources		
A:	Covi, Michelle			
C:	Diaz, Rafael	Old Dominion University		
A:	Ermasova, Natalia	Governors State University		
C:	Erten-Unal, Mujde	Old Dominion University		
C:	Feken, Stacey	The Albemarle-Pamlico National Estuary Partnership		
A:	Goodall, Jonathan L.	University of Virginia		
C:	Harvey, Rodger	Old Dominion University	rharvey@odu.edu	
C:	Havens, Kirk, J.	Virginia Institute of Marine Science		
C:	Hershner, Carl	Virginia Institute of Marine Science		
A:	Guthrie, Amanda	Virginia Institute of Marine Science		
A:	Jones, Peter A.	University of Alabama Birminghan		
C:	Khan, Iftekharuddin	Old Dominion University		
A:	Kiefer, John	University of New Orleans		
A:	Hutton Shannon, Nicole	Old Dominion University		
A:	King, Angela	Virginia Coastal Policy Center		
C:	Jones, Shana	University of Georgia		
C:	Landry, Craig	University of Georgia		
A:	Jordan, Meagan M	Old Dominion University		
A:	Leland, Suzanne	University of North Caroline - Charlotte		
A:	Loftis, Jon Derek	Virginia Institute for Marine Science		
C:	Mason, Sam	William & Mary		
C:	Mason, Pamela	Virginia Institute of Marine Science		
A:	Mayer, Martin	University of North Caroline - Pembroke		
C:	McLeod, George	Old Dominion University		
A:	McShane, Michael	Old Dominion University		
A:	Merrill, Jennifer	University of Delaware		
C:	Mitchell, Molly	Virginia Institute of Marine Science		

A:	Nicula, Janet Gail	Old Dominion University		
C:	Nunez, Karinna	Virginia Institute of Marine Science		
C:	Ragin, Mark	University of Georgia		
A:	O'Connell, Lenahan	University of Kentucky		
A:	Rawat, Pragati	Slippery Rock University		
C:	Richards, Daniel P	Old Dominion University		
A:	Rohring, Elizabeth	Sea Grant		
C:	Saitgalina, Marina	Old Dominion University		
C:	Scheld, Andrew	Virginia Institute of Marine Science		
A:	Shen, Haiying	University of Virginia		
A:	Smirnova, Olga	Eastern Carolina University		
A:	Srithongrung, Arwiphawee	University of Illinois - Springfield		
A:	St. John III, Burton	University of Colorado - Boulder		
C:	Stafford, Sarah	William & Mary		
C:	Stiff, Mary Carson	Wetlands Watch		
C:	Stiles, Skip	Wetlands Watch		
C:	Tahvildari, Navid	Old Dominion University		
C:	Vandecar-Burdin, Tancy	Old Dominion University		
A:	Usher, Lindsay	Old Dominion University		
A:	Whytlaw, Jennifer	Old Dominion University		
C:	Wright, Jeffrey	University of Georgia		
C:	Leu, Matthias	College of William &Mary		
C:	Montz, Burrell	East Carolina University		
C:	Isdell, Robert	Virginia Institute of Marine Science		
C:	Hartley, Troy	Virginia Institute of Marine Science		
C:	Denckla Cobb, Tanya	University of Virginia		
C:	Zhang, Joseph	Virginia Institute of Marine Science		
A:	Marshall, Jennifer	University of South Florida		
A:	Merlo, Kelsey	University of South Florida		
C:	Cacciatore, Michael A	University of Georgia		
C:	Farhadzadeh, Ali	Stony Brook University		
C:	Waisman, Haim	Columbia University		
C:	Sudol, Taryn	Maryland Sea Grant		
C:	Tang, Hansong	CUNY		
C:	Gonzalez, Cirse	Virginia Institute of Marine Science		
C:	Mildenhall, Stephen	St. John's University		
C:	Johnson, Ashley	Jacksonville University		
C:	Torres, Hannah	George Mason University		
A:	Dunn, Elizabeth	University of South Florida		
A:	Mumford, Steven	University of New Orleans		

Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief must list the entire editorial board.

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E: Other co-Editors of journal or collections with whom the individual has directly interacted in the last 24 months.

to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active
B:	Little, Richard		Public Works Management and Policy	
E:	Espinosa, Salvador	San Diego State University	Public Finance and Management	
E:	Kriz, Ken	University of Illinois - Springfield	Public Finance and Management	
E:	Burton St. John III	University of Colorado - Boulder	Climate Change Communication (Routledge edited bool	

The following information regarding collaborators and other affiliations (COA) must be separately provided for each individual identified as senior project personnel. The COA information must be provided through use of this COA template.

Please complete this template (e.g., Excel, Google Sheets, LibreOffice), save as .xlsx or .xls, and upload directly as a Fastlane Collaborators and Other Affiliations single copy doc. Do not upload .pdf.

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Fixed column widths keep this sheet one page wide; if you cut and paste text, set font size at 10pt or smaller, and
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Table 1: List the individual's last name, first name, middle initial, and organizational affiliation in the last 12 months.

1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Denckla Cobb, Tanya	University of Virginia	

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R: Additional names for whom some relationship would otherwise preclude their service as a reviewer.

to disambiguate common names

2	Name:	Type of Relationship	Optional (email, Department)	Last Active

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G: The individual's Ph.D. advisors; and
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3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)

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to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Yusuf, Juita-Elena (Wie)	Old Dominion University		
C:	Yusuf, Juita-Elena (Wie)	Old Dominion University		
A:	Andrews, Elizabeth	Virginia Coastal Policy Center		
C:	Andrews, Elizabeth	Virginia Coastal Policy Center		
A:	O'Leary, Amy	Virginia Transportation Research Center		
A:	Miller, John	Virginia Transportation Research Center		
A:	Youngblood, David	Virginia Department of Transportation		
A:	Cook, David	Virginia Department of Transportation		
A:	Wynne, Shelley	Virginia Department of Transportation		
A:	Weaver, Kristina	University of Virginia		
A:	Foreman, Michael	University of Virginia		
A:	Bingham, Shantell	Cultivate Charlottesville		
A:	King, Angela	Virginia Coastal Policy Center		
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1	Your Name:	Your Organizational Affiliation(s), last 12 r	Last Active Date
	Shafiee-Jood, Majid	University of Virginia	
		University of Illinois at Urbana-Champaign	7/31/2020

Table 2: List names as last name, first name, middle initial, for whom a personal, family, or business relationship would otherwise preclude their service as a reviewer.

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to disambiguate common names

2	Name:	Type of Relationship	Optional (email, Department)	Last Active
R:	Alemazkoor, Negin	Family		

Table 3: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following.

G: The individual's Ph.D. advisors; and

T: All of the individual's Ph.D. thesis advisees.

to disambiguate common names

3	Advisor/Advisee Name:	Organizational Affiliation	Optional (email, Department)
G:	Cai, Ximing	University of Illinois at Urbana-Champaign	Department Civil and Environmental Engineering

G:	Kumar, Praveen	University of Illinois at Urbana-Champaign	Department Civil and Environmental Engineering

Table 4: List names as last name, first name, middle initial, and provide organizational affiliations, if known, for the following:

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C: Collaborators on projects, such as funded grants, graduate research or others in the last 48 months.

to disambiguate common names

4	Name:	Organizational Affiliation	Optional (email, Department)	Last Active
A:	Apurv, Tushar	IIT Kanpur		
A:	Arumugam, Sankar	North Carolina State University		
A:	Back, Scott	Utah State University		
A:	Bales, Jerad	CUAHSI		
A:	Cai, Ximing	University of Illinois at Urbana-Champaign		
A:	Deryugina, Tatyana	University of Illinois at Urbana-Champaign		
A:	Fils, Doug	Consortium for Ocean Leadership		
A:	Ge, Yan	University of Illinois at Urbana-Champaign		8/31/16
A:	Hahmann, Torsten	University of Maine		
C:	Hall, Beth	Purdue University		
A:	Horsburgh, Jeffery	Utah State University		
A:	Housh, Mashor	University of Haifa		
A:	Huang, Renke	Pacific Northwest National Laboratory		
A:	Huang, Zhenyu	Pacific Northwest National Laboratory		
A:	James, Douglas	*Deceased*		
A:	Johnson, Michael	University of California, Santa Barbara		
A:	Kokoszka, Sylwia	University of Illinois at Urbana-Champaign		5/31/16
A:	Madani, Kaveh	Yale University		
A:	Marston, Landon	Virginia Tech		
A:	Mazrooei, Amirhossein	North Carolina State University		
A:	Merwade, Venkatesh	Purdue University		
A:	Onda, Kyle	Duke University		
A:	Ranjithan, Ranji	North Carolina State University		
A:	Riasi, Sadegh	University of Cincinnati		
A:	Rice, Shawn	Purdue University		
A:	Saksena, Siddharth	Virginia Tech		
C:	Schnitkey, Gary	University of Illinois at Urbana-Champaign		
A:	Shepherd, Adam	Woods Hole Oceanographic Institution		
A:	Singhofen, Peter	Streamline Technologies, Inc.		
A:	Stephan, Shirly	University of Maine		
A:	Tarboton, David	Utah State University		
A:	Tartakovsky, Alexandre	Pacific Northwest National Laboratory		
A:	Wallington, Kevin	University of Illinois at Urbana-Champaign		
A:	Yeghiazarian, Lilit	University of Cincinnati		

Table 5: List editorial board, editor-in chief and co-editors with whom the individual interacts. An editor-in-chief must list the entire editorial board.

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to disambiguate common names

5	Name:	Organizational Affiliation	Journal/Collection	Last Active

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./DUE DATE
NSF 20-567 **09/09/20**

☐ Special Exception to Deadline Date Policy

FOR NSF USE ONLY
NSF PROPOSAL NUMBER

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)
ICER - CoPe-Coastlines and People

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
				065391526	

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)
546001796

SHOW PREVIOUS AWARD NO. IF THIS IS
☐ A RENEWAL
☐ AN ACCOMPLISHMENT-BASED RENEWAL

IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE
University of Virginia Main Campus

AWARDEE ORGANIZATION CODE (IF KNOWN)
0037457000

ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE
University of Virginia Main Campus
P.O. Box 400195
Charlottesville,VA.229044195

NAME OF PRIMARY PLACE OF PERF
The University of Virginia

ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE
The University of Virginia
1001 N. Emmet St.
Charlottesville ,VA ,229044195 ,US.

IS AWARDEE ORGANIZATION (Check All That Apply)
☐ SMALL BUSINESS ☐ MINORITY BUSINESS
☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS

☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT **Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ **4,856,493**	**60** months	**05/01/21**	

THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW
☐ BEGINNING INVESTIGATOR
☐ DISCLOSURE OF LOBBYING ACTIVITIES
☐ PROPRIETARY & PRIVILEGED INFORMATION
☐ HISTORIC PLACES
☐ VERTEBRATE ANIMALS IACUC App. Date
PHS Animal Welfare Assurance Number
☒ TYPE OF PROPOSAL **Research**

☒ HUMAN SUBJECTS Human Subjects Assurance Number **00006183**
Exemption Subsection **Pending** or IRB App. Date
☐ FUNDING OF INT'L BRANCH CAMPUS OF U.S IHE ☐ FUNDING OF FOREIGN ORG
☐ INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED

☒ COLLABORATIVE STATUS
A collaborative proposal from one organization (PAPPG II.D.3.a)

PI/PD DEPARTMENT
Department of Environmental Sciences

PI/PD FAX NUMBER
434-982-2137

PI/PD POSTAL ADDRESS
291 McCormick Rd
Clark Hall
Charlottesville,VA 229044123
United States

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address
PI/PD NAME **Karen McGlathery**	**PhD**	**1992**	**434-924-0558**	**kjm4k@virginia.edu**
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CERTIFICATION PAGE

Certification for Authorized Organizational Representative (or Equivalent)

By electronically signing and submitting this proposal, the Authorized Organizational Representative (AOR) is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding conflict of interest (when applicable), flood hazard insurance (when applicable), responsible conduct of research and organizational support as set forth in the NSF Proposal & Award Policies & Procedures Guide (PAPPG). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

Certification Regarding Conflict of Interest

The AOR is required to complete certifications stating that the organization has implemented and is enforcing a written policy on conflicts of interest (COI), consistent with the provisions of PAPPG Chapter IX.A.; that, to the best of his/her knowledge, all financial disclosures required by the conflict of interest policy were made; and that conflicts of interest, if any, were, or prior to the organization's expenditure of any funds under the award, will be, satisfactorily managed, reduced or eliminated in accordance with the organization's conflict of interest policy. Conflicts that cannot be satisfactorily managed, reduced or eliminated and research that proceeds without the imposition of conditions or restrictions when a conflict of interest exists, must be disclosed to NSF via use of the Notifications and Requests Module in FastLane.

Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the:

(1) community in which that area is located participates in the national flood insurance program; and
(2) building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:

(1) for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
(2) for other NSF grants when more than $25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible Conduct of Research (RCR)

(This certification is not applicable to proposals for conferences, symposia, and workshops.)

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Certification Regarding Organizational Support

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that there is organizational support for the proposal as required by Section 526 of the America COMPETES Reauthorization Act of 2010. This support extends to the portion of the proposal developed to satisfy the Broader Impacts Review Criterion as well as the Intellectual Merit Review Criterion, and any additional review criteria specified in the solicitation. Organizational support will be made available, as described in the proposal, in order to address the broader impacts and intellectual merit activities to be undertaken.

Certification Regarding Dual Use Research of Concern

By electronically signing the certification pages, the Authorized Organizational Representative is certifying that the organization will be or is in compliance with all aspects of the United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME		

TELEPHONE NUMBER	EMAIL ADDRESS	FAX NUMBER

PROJECT SUMMARY

Overview:

LOI# L02613710. Rural coastal communities are strongly dependent on natural resources that are affected by climate change, particularly by saltwater intrusion from accelerated sea-level rise and more severe storm flooding. At the same time, they face especially difficult challenges in responding to climate risks, including lack of access to scientific information and expertise, lack of coordination among communities, geographical isolation, social inequities, unstructured governance, and limited institutional capacity. The decentralized nature of decisions in rural regions often results in a focus on short-term and local benefits and the inequitable use of public resources rather than on longer-term climate adaptation strategies. We propose a focused Coastal Futures Hub to address this inequity and information gap for rural coasts by bringing together scholars and stakeholders to co-produce an open-source and interactive data, modeling, and visualization platform to enable sustained collaboration and support equitable decision making and solution adoption.

Intellectual Merit:

Saltwater intrusion from sea-level rise and storm flooding is having widespread and adverse effects on water security in rural communities. A critical challenge to increasing coastal resilience is the need to couple environmental risk assessment with an understanding of the social and economic factors that influence behaviors and decision-making. The Coastal Futures Hub addresses this challenge in the rural Eastern Shore of Virginia (ESVA), a hot spot for climate impacts, and a model system to understand how an integrated network of researchers, policy-makers, stakeholders and educators can build rural community capacity to deal with climate impacts. The Hub framework will create a continued interactive learning community responsive to evolving needs related to saltwater intrusion, coastal flooding, and groundwater sustainability. Data meta-analysis, spatial mapping, and modeling will (1) quantify environmental risks related to salt-water intrusion and coastal flooding, and (2) determine how social and economic factors interact with environmental risks to influence decision-making and equity; and culminate in (3) an open-source and interactive data, modeling, and visualization platform (Climate Equity Atlas) that will assist stakeholders in making effective, equitable adaptation decisions. Every aspect of the Hub involves engagement of multi-sector stakeholders (e.g., government agencies, non-profits, cooperative extension, community-based organizations, households) who bring diverse local knowledge and perspectives to co-produce the research agenda and to collaborate on research and solution implementation. The Coastal Futures Hub builds on long-term collaborations and databases and also forges new relationships among researchers and stakeholders. It brings together scholars from the University of Virginia, College of William and Mary, and Old Dominion University in ecology, hydrology, oceanography, engineering, economics, data science, environmental ethics, community engagement, law, public policy, arts, and humanities.

Broader Impacts:

Rural coastal communities are underserved by research and effective communication on coastal change. The Coastal Futures Hub will create partnerships that will broaden participation and promote collaborative knowledge production and local capacity-building, in ways that especially support traditionally underserved and vulnerable people. Engaging local leaders and training community members in data literacy will increase community capacity and confidence in using the decision-support platform and sustain long-term researcher-stakeholder partnerships. This will directly benefit the rural community, reduce inequities of climate risk, and enhance long-term climate adaptation. In the rural ESVA, 35% of the population is traditionally underserved, household income is half the state average, the poverty rate is twice the state average, and all public schools are Title 1, where >70% of students receive lunch support. Education programs will increase access to STEM education through a K-12 “Learning in Place” curriculum with local families, and tiered mentoring of graduate students and local high school and undergraduate students. The co-produced Climate Equity Atlas will be an open-source data, modeling, and visualization platform that will exist beyond the Hub funding cycle, and the methods and tools developed will be transferable to other rural localities in the U.S. and abroad facing similar climate challenges.

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*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

Focused CoPe HUB
Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities

1. VISION, MOTIVATION and IMPACT

1.1. Research Theme and Rationale

Rural coastal communities are highly dependent on natural resources that are affected by climate change, particularly by saltwater intrusion from accelerated sea-level rise and more severe storm flooding. At the same time, they face especially difficult challenges in responding to climate risks, including lack of access to scientific information and expertise, lack of coordination among communities, geographical isolation, social inequities, unstructured governance, and limited institutional capacity (IPCC 2014). This is especially true in Virginia, a hot spot for accelerated climate impacts, where sea-level rise is three times higher than the global average (Sallenger et al. 2012), coasts are experiencing two to five times more recurrent "sunny day" flooding than the national average (Sweet et al. 2020), and storm frequency has increased over the last 100 years (Hayden & Hayden 2003; Emanuel et al. 2013, 2017). These changes affect water security for agriculture and drinking, habitat loss, and infrastructure (Dermet et al. 2018; Tully et al. 2019a). The decentralized nature of decisions in rural regions often results in a focus on short-term and local benefits and the inequitable use of public resources rather than on longer-term adaptation strategies (National Climate Assessment 2014). Despite the urgency and severity of the need, rural communities like those in Virginia are currently underserved by research and effective communication on coastal change. ***The goal of the Coastal Futures Hub is to address this inequity and information gap for rural coasts by bringing together scholars and stakeholders who will co-produce an open-source data, modeling and visualization platform (Climate Equity Atlas) to enable sustained collaboration and support equitable decision making and solution adoption on risks of flooding and saltwater intrusion.***

Saltwater intrusion is the leading edge of climate change on the coast. Accelerated sea-level rise and storm flooding is already impacting the world's coastlines, most starkly evident as the abandonment of farms and the encroachment of saltwater wetlands creating "ghost forests" (Williams et al. 1999; Anderson & Al-Thani 2016; Kirwan & Gedan 2019). These changes have widespread and adverse effects on the largely rural communities, economies, and well-being primarily by reducing agricultural production, degrading water quality, and impacting infrastructure (Kahn et al. 2016; Tully et al. 2019). The extent to which saltwater will affect agricultural and natural ecosystems, and the livelihoods that depend on them, is also dependent on decisions by individual landowners and industry (e.g., agriculture, poultry) about water management (Poulter et al. 2008; Bhattachan et al. 2018), and by conservation organizations to protect shorelines (Shepard et al. 2011; Sutton-Grier et al. 2015). In many rural regions, climate impacts have disproportionate effects on underserved community members, particularly those of color (Hardy et al. 2017; Jurjonas & Seekamp 2020).

Despite the risks of flooding, soil and aquifer salinization, and groundwater sustainability, there is not a holistic understanding of the extent and variation across rural landscapes at scales meaningful to individual and community risk assessment and decision-making, nor of the differential risk and capacity for communities to adapt. Supporting these rural coastal communities in making the best adaptation decisions requires connecting research, data synthesis and modeling, with ways for a diverse group of stakeholders to help define problems and priorities, understand and visualize risks and social inequities, and weigh tradeoffs and perspectives. ***We propose a CoPe Hub that will provide communities with the ability to make full use of all available data on groundwater sustainability, saltwater intrusion, and coastal flooding, contribute their own knowledge and views, and build insights and capacity to meet current climate resilience needs and prepare for their futures. By taking advantage of new techniques for collecting, analyzing, integrating, and visualizing social and environmental data, and promoting data literacy and trust among stakeholders, the Coastal Futures Hub will catalyze community-driven, data-rich, equitable decision-making.*** It creates a critical link between natural science risk/benefit analysis and forecasting with social science and community development to enable better-informed, evidence-based

decisions and policies (Keller et al. 2018a,b). Co-production ensures that the research is salient and valuable, enhances research practice, and strengthens connections between research outcomes and knowledge use (Howell & Wilson 2018; Arnott et al. 2019; Lemos et al. 2019).

The Coastal Futures Hub framework addresses key challenges identified in National Research Council reports on transdisciplinary research and team science and by the National Science Foundation on "Big Ideas", all emphasizing that a paradigm shift to convergent transdisciplinary research is crucial for solving society's complex problems. This transition requires integrating quantitative and qualitative data, understanding the methods and languages of different disciplines, creating shared goals and metrics of success, and developing cross-sector team skills (Palmer et al. 2016). The Coastal Futures hub builds on current collaborations and trusted relationships and also creates new partnerships to create an open-source platform for scholars and practitioners to share their languages, perspectives, and methods to converge on common goals and means of achieving them. The Coastal Futures Hub's guiding principle is that co-producing knowledge and sharing power through strong networks and collective, data-rich knowledge makes more adaptive socio-environmental systems.

1.2. Research Hypotheses, Objectives, and Guiding Questions

Our CoPe Hub addresses two integrated hypotheses at the interface of coastal natural processes, hazards, and people: (1) Sea-level rise and storms are increasing salinity (in groundwater and soils) and flooding, accelerating inequity in water security risks distributed over the land base and demographic groups; and (2) Providing a centralized and sustained Hub for data-enriched decision-making in rural regions connecting researchers, policy makers, stakeholders and educators will shift the focus from short-term and local benefits to more equitable longer-term adaptation strategies. We expect that feedbacks from the community in curating data and modeling future scenarios of change will both enhance the models and platform development and amplify voices not typically engaged in the climate adaptation dialogue; both factors will increase rural community resilience in the face of climate change. We envision a sustained and coordinated Hub that addresses these hypotheses through convergent research and co-production on the following research objectives and guiding questions:

(1) Determine social-environmental risks, burdens, assets, and options at multiple scales
   a. What are the spatial and temporal trends of increased coastal flooding, soil and groundwater salinization, and groundwater recharge, and how do they impact freshwater supply and quality, crop production, and coastal habitats (e.g., forests and wetlands)?
   b. Where, and for whom, are climate risks and inequities most pronounced now and in future scenarios, and what are community assets to deal with them?
   c. How will water security change across different communities and sectors under different scenarios of individual to community actions, and what adaptation options (e.g., salt-tolerant crops, modifying water use) are feasible and efficient in different localities?

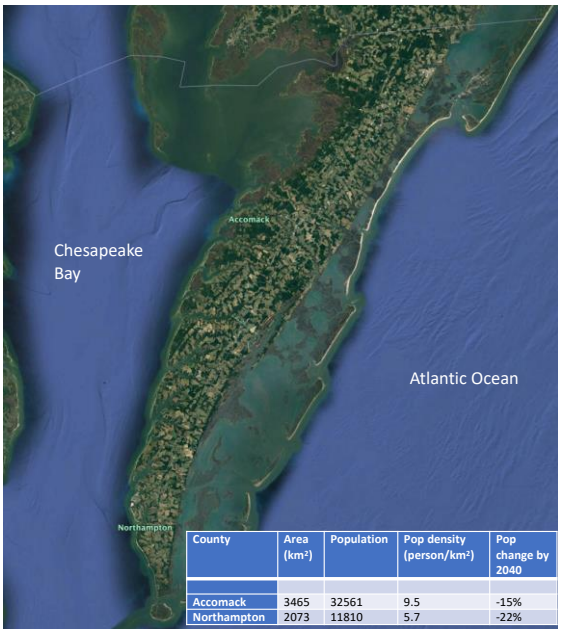
(2) Assess stakeholder networks, information flow, scenario modeling, and solution development
   a. How do various stakeholders understand and prioritize the risks, burdens, and benefits of coastal environmental processes and change?
   b. What is the depth and complexity of information networks and how are they differentiated in incorporated, unincorporated, and/or underrepresented communities?
   c. What are the key interactions affecting the flow of information and decision-making in climate-relevant policymaking? In what ways would a change in the structure of information flow influence policy adoption? How can information about feasible, equitable adaptation options be disseminated and incorporated into key interactions and local policies?

(3) Co-create community data systems and decision support tools
   a. What relevant data currently exist, how are they generated, stored, and shared with community/stakeholders, and what are the data and information gaps?

b. What are the key factors to the co-production of information systems and decision support tools that are most effective in distilling, integrating, and equitably representing research and community knowledge and in supporting community decisions?
c. What are the key predictors of the community's capacity for adaptation, and how can the interaction between the scientists, community members, and stakeholders improve the community's adaptation capacity?
d. How will the scientist, community members, and stakeholder interaction, and co-production of the Climate Equity Atlas feed back to improved researcher understanding and prediction of the coastal socio-environmental system?

1.3. Opportunities through Interdisciplinary and Multi-Sector Collaborations

The Eastern Shore of Virginia (ESVA) on the Delmarva Peninsula is a model system to understand how an integrated network of researchers, policy-makers, stakeholders and educators can build rural community capacity to deal with climate change and its impacts (Fig. 1). Like many rural coasts in the U.S. and abroad, the ESVA faces challenges with greater frequency of flooding, saltwater intrusion into the sole-source groundwater aquifer system used for drinking water and irrigating agricultural fields, and salinization of farm fields and forests. A 2015 community survey by the local planning district commission highlighted that "water" was the second most important issue on the ESVA (A-NPDC 2016); water use is dominated by agriculture (33%), followed by commercial, industrial (45%) and municipal (22%) uses. Drawdowns and saltwater intrusion are localized near withdrawal wells (Arcadis 2019). It is expected that increases in municipal demands for groundwater will exacerbate saltwater intrusion. About 330 ha of low-lying farmland are lost each year to saltwater inundation (Titus et al. 2010). Communities are considering a range of adaptation options that include salt-tolerant crops, modified agricultural water use, habitat restoration with living shorelines, infrastructure improvements, and managed retreat.



County	Area (km²)	Population	Pop density (person/km²)	Pop change by 2040
Accomack	3465	32561	9.5	-15%
Northampton	2073	11810	5.7	-22%

Fig. 1. The rural coast of the Eastern Shore of Virginia on the Delmarva Peninsula, bordered to the east by the Atlantic Ocean and to the west by the Chesapeake Bay.

The ESVA region has a multi-generational history of adapting to coastal change that promotes a strong sense-of-place in many communities, a bond between people and place that is often found in rural regions (Raymond et al. 2017). This cultural heritage is overlaid by a demographic shift over the last two decades from an influx of second-home owners, retirees, and those supporting the economy in agriculture, aquaculture/fishing, conservation, and ecotourism. However, even with this change, the regional population is declining (Fig. 1; UVA Weldon Cooper Center 2019). Variations in population structure, socio-economic, political and cultural characteristics, community assets, land use, and climate risk over a relatively small geographic scale allow comparisons that help identify leverage points where research and data can support adaptation strategies that are actionable. By understanding these leverage points and feedbacks, our place-based work can be translated to other rural coastal regions in the U.S. and abroad.

The Coastal Futures Hub builds on long-term collaborations on the ESVA and also forges new collaborations both among researchers and stakeholders. It will bring together scholars from three institutions (University of Virginia, College of William and Mary, Old Dominion University) across diverse fields – ecology, hydrology, oceanography, engineering, economics, data science, co-production, environmental ethics, law, policy, arts, and humanities. These disciplines are all needed to create a holistic understanding of how people can cope with climate challenges. For example, understanding the impacts of

sea-level rise and storm surge on saltwater intrusion into groundwater and ecosystem change (farm field and forest transitions to salt marsh) requires expertise in oceanography, hydrology and ecology. Determining how this affects local communities requires knowing how people access and consume water, what options are available for alternative salt- or drought-tolerant crops, community assets and inequities that may be opportunities or barriers to change, and how new practices are diffused and adopted. The Coastal Futures Hub leverages and integrates data, models, and visualization approaches developed through the Virginia Coast Reserve Long Term Ecological Research project, UVA's Biocomplexity Institute, and the Equity Atlas spearheaded by UVA's Equity Center (Section 3.1)

By including stakeholders from multiple sectors – government, businesses, non-profits, and residents – the Hub's activities will increase the legitimacy, salience, and usability of the knowledge created and information disseminated to support climate adaptation. Our team has expertise and extensive experience in community engagement and participatory research on the ESVA through the Resilience Adaptation Feasibility Tool (RAFT), a community-based process to identify and prioritize adaptation needs, co-led by UVA's Institute for Environmental Negotiation (IEN), W&M's Virginia Coastal Policy Center (VCPC), and ODU's Resilience Collaborative (Section 3.1). We will expand the engagement of underrepresented populations to broaden participation and ensure that diverse community voices are part of the development and implementation process (Section 2.5, 3.4). The two counties on the ESVA – Accomack and Northampton – are comprised of 65% white, 30% black, and others identifying as Native American or Asian (ACS 2019). Engaging community members with "lived experience" and place-based knowledge will intentionally share power among researchers and the community and will improve the value, relevance, and accessibility of the research produced (Wilson 2018; Arnott et al. 2020). ***Together we will study issues that address community priorities and openly share data and create an open-source decision-support platform that helps translate research findings into tangible actions that simultaneously promote climate resilience and reduce social inequities.***

The Coastal Futures Hub framework and goals are responsive to the needs identified by multi-sector ESVA stakeholders in initial visioning meetings with the PIs and Senior Investigators. These included members of citizen groups (e.g., Citizens for a Better Eastern Shore), government agencies (e.g., Departments of Natural Resources and Environmental Quality), non-profits (e.g., The Nature Conservancy, Master Naturalists), and the regional planning commission. They identified the following needs: (1) develop a systems approach to connect communities (or segments of communities) in knowledge generation and information sharing; (2) create an entity to coordinate expertise and proactively offer solutions to individual property owners, government entities, community-based organizations; (3) generate additional data and expertise to expand solution possibilities; and (4) develop mechanisms of information sharing.

2. COASTAL FUTURES HUB FRAMEWORK

The most critical challenge to increasing coastal resilience is to couple environmental risk assessment with an understanding of the social and economic factors that influence behaviors and decision-making. The Coastal Futures Hub addresses this challenge by creating a multi-disciplinary, multi-sector interactive learning community that is responsive to evolving needs related to saltwater intrusion and coastal flooding (Fig. 2). Data meta-analysis, spatial mapping, and modeling will: (1) quantify environmental risks related to water security (sea-level rise, flooding, saltwater intrusion, sustainable water supply), and (2) determine how social and economic factors interact with environmental risks to influence decision-making and climate equity; this will culminate in (3) a co-created open-source data, modeling, and visualization platform (Climate Equity Atlas) that will assist stakeholders in making effective, equitable adaptation decisions. Training in data literacy will increase community capacity and confidence in using the tool and sustain long-term researcher-stakeholder partnerships (Section 2.4). Every aspect of the Hub involves engagement of stakeholders who bring multiple perspectives to co-produce the research agenda and to collaborate on research and solution implementation; details are given in Section 2.5. In short, workshops will be held to create partnerships that define the research priorities, identify data sources, and engage local community leaders; participant surveys for the social-environmental modeling will be

coordinated with the workshops and working groups; and community members will trial and give feedback on the decision-support platform.

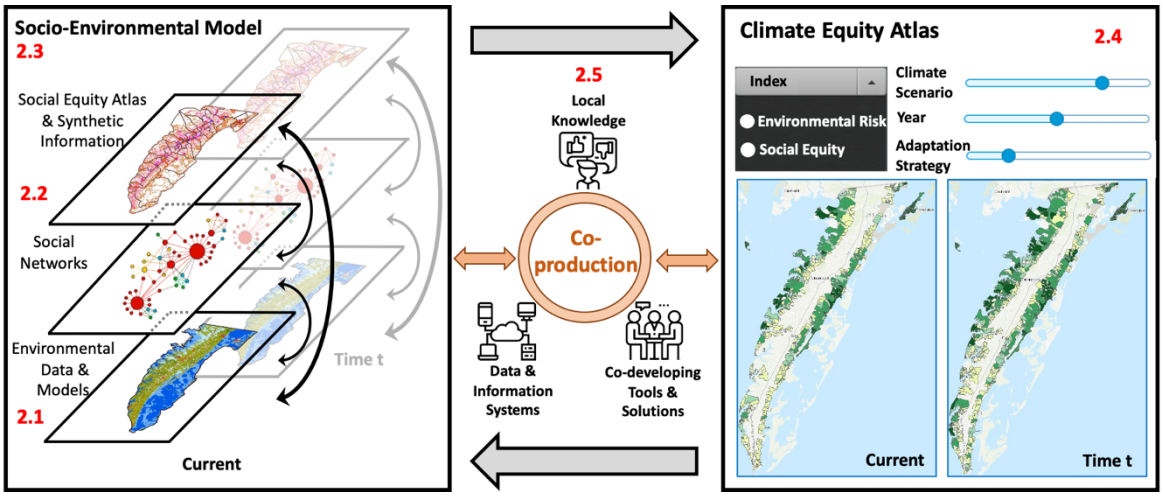


Fig. 2. The Coastal Futures Hub co-production framework links environmental information and models (2.1), socio-economic information sources, models, and analytical tools (2.2), and integrated socio-environmental modeling (2.3) with advanced visualization and data infrastructure (Climate Equity Atlas, 2.4), all co-produced with community stakeholders to identify priority problems and solutions (2.5). The open-source decision-support tool will assist diverse stakeholders in making equitable climate adaptation decisions.

2.1. Environmental Data, Information Sources, and Modeling

Environmental Data and Information Sources: Environmental risk of individuals and communities results from both biogeophysical hazards and exposure (Cutter 1996), each of which are spatially variable. Hazards can vary significantly over short distances and durations (e.g., flood hazard based on proximity and elevation gradient from coastlines), or longer distances and durations (reduced water yield and quality from aquifers, soil salinization). Estimating current and future environmental hazards requires detailed GIS and spatial modeling, and integrating socio-environmental modeling at parcel to regional scales (Fig. 2; Q.1a). Spatial information characterizing terrain, soils, natural and built drainage systems, aquifers, and land use/cover will be coupled with coastal surge and hydrological models (Fig. 3), current climate and climate change projections, and management practices to generate current and future coastal hazard patterns. Decisions by individuals and communities are essential inputs and feedbacks. The environmental models will be directly linked to social network analysis, population information, and the stakeholder decision model to represent behavioral and practice adoption feedbacks (Sections 2.2, 2.3).

Sources of environmental information include public domain spatial data (1m lidar elevation and remotely sensed land use/cover, infrastructure, soils, streamflow, tidal water levels, sea-level rise projections, coastal geomorphic change). Primary data collection will be from ongoing research, including the NSF-funded Virginia Coastal Reserve Long Term Ecologcial Research project (VCR LTER), that will be augmented with local knowledge of residents, agencies (e.g., Cooperative Extension, Department of Environmental Quality), and nonprofits (Q3a). Local knowledge in terms of chronic conditions (e.g., salinization, groundwater supply), major events (e.g., large storms, inland and coastal flooding, drought), and perceived trends are vital to building a comprehensive information base. Local knowledge and perceptions may differ from geophysical data and inference, and among different community members. Similarities and differences among these diverse data sources will be identified and addressed as key components of participatory research to test, improve, and build confidence in environmental models (Q3d).

Hydrological Modeling: Coupled surface and subsurface hydrologic modeling will be used to characterize flood hazard, water supply, soil and groundwater salinization, and soil moisture stress on crop production, with input of management choices (Q1a). We will integrate two complementary models that are widely used for these purposes: (1) an extended version of the Soil and Water Assessment Tool

(SWAT+) (Arnold et al. 2012; Bieger et al., 2017); and (2) SEAWAT (Langevin et al. 2007). SWAT+ simulates quality and quantity of soil water and runoff, groundwater recharge, and streamflow, incorporating land use and management practices. Bailey et al. (2019) have updated salinization modules within SWAT to study soil salinity trends and management at watershed levels. SWAT+ (Bieger et al., 2017) includes connectivity for water and constituent routing, an interface with the groundwater model, MODFLOW, and multi-crop growth. SWAT+ will be calibrated with climate data, stream stage and flow collected by the USGS and the VCR LTER.

SEAWAT is an extension of the groundwater flow and transport models, MODFLOW and MT3DMS, required to describe saltwater intrusion. SWAT has been coupled with SEAWAT to provide net recharge patterns to monitor saltwater intrusion in coastal regions (Akbarpour & Niksokhan 2018; Chang et al., 2016; Webb & Howard, 2011). The Virginia Department of Environmental Quality (VaDEQ) has updated and implemented SEAWAT as VAHydroGW-ES (VaDEQ 2019), and uses this model to evaluate proposed groundwater use for impacts on water table drawdown and saltwater intrusion. Water demands included in the model are municipal, agriculture, commercial, and industrial. On the ESVA, industry is primarily poultry processing and seafood, separate from the agriculture sector due to differences in water use and stakeholder structure. In recent years, groundwater has supplied 100% of the supply for municipal, industrial, and commercial users (ANPDC 2013). We will extend current climate analysis with ensemble future climate scenarios from CMIP5 and CMIP6 downscaled, bias-corrected climate data (Navarro-Racines et al., 2020; Eyring et al. 2016), and locally formulated land use, water and development demand projections, as input to the coupled SWAT+/VAHydroGW-ES model. Scenarios and key metrics of groundwater sustainability will be co-produced with community input. Crop rotations, fertilizer and drainage management can be directly incorporated into SWAT+, derived from a combination of CropScape-defined crop types at 30m resolution (Han et al. 2012), stakeholder knowledge and practices, and extension agents. Groundwater sustainability metrics may include safe yield to demand ratios, frequency of water use restrictions, soil and aquifer salinity conditions. Feedbacks between groundwater conditions (based on key metrics) and water use behavior and policy will be identified in the community workshops, and implemented in the coupled models.

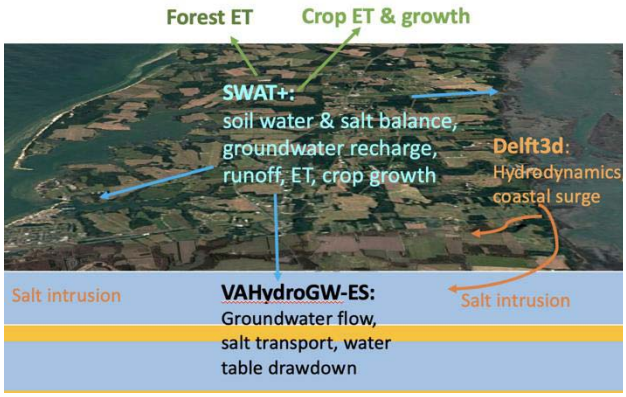


Fig. 3. The watershed ecohydrology model (SWAT+), groundwater model (VAHydroGW-ES, modified from SEAWAT), and the DelftD hydrodynamic model, will be coupled to simulate potential soil and groundwater salinization, coastal flooding, under current climate, land use, management and water use, and future scenarios.

Storm Surge and Coastal Flooding Analysis and Modeling: Analysis of long-term water-level records and hydrodynamic modeling of storm-surge producing conditions will be used to characterize flood risk associated with storms (Q1a). Forty year records of hourly water levels are available from NOAA at seaside (Wachapreague, VA) and bayside (Kiptopeke, VA) sites. These records can be decomposed into astronomical and meteorological contributions to the tides. Combined with long-term meteorological data from the region, frequencies, magnitudes and drivers of storm surge can be identified. For example, Fagherazzi et al. (2010) showed that northeasterly wind events promote storm surge in the Virginia coastal bays whereas southwesterly winds suppress water levels. These long-term records can also be used to forecast the potential for increased flooding due to the combination of sea-level rise, tides, and storms using statistical modeling approaches (e.g, Tadesse et al. 2020). Hydrodynamic models can be used to generalize results from individual tide gauges to a larger region and investigate storm surge effects related to individual events. Delft3D (Veeramony et al. 2017) is already in use to model hydrodynamics in the coastal bays of Virginia (Wiberg et al. 2015; Castagno et al. 2018), and will be extended to specifically quantify the

inundation associated with storm surge accompanying tropical and extratropical storms. This will include projected future storms and higher sea levels. Future scenarios and most metrics of storm-surge flooding will be co-produced with community input. Storm surge inundation will be mapped to SWAT+ model elements (hydrologic response units - HRU) to provide inputs of surge water and salinity to infiltration and runoff processes, and to set hydraulic gradients for aquifer salt intrusion.

2.2. Socio-Economic Data, Information Sources, and Modeling

We will collect and integrate publicly available data sources for the ESVA to characterize social equity (risks and assets), population characteristics, and information flow. These analyses will help characterize socio-economic feedbacks that are important for both individuals and communities to deal with climate-related issues under current conditions and in future scenarios. Along with the environmental data and modeling, this information will inform the coupled agent-based Socio-Environmental Model (Section 2.3), and the Climate Equity Atlas (Section 2.4) that our community members will use to test "what-if" decision scenarios during community workshops and data literacy trainings. Our integrated approach is threefold: (1) to create a spatially explicit visualization of social equity for the region; (2) aggregate populations and evaluate decision outcomes based on statistical information tailored to different stakeholder groups at spatial scales relevant to specific climate risks; and (3) analyze social networks to characterize information flows. Key stakeholders are individual households, Accomack and Northampton counties and their townships, conservation organizations, community-based organizations, second home and recreation-based communities, and agriculture and poultry industries.

Social Equity Atlas: Equity Atlases are a type of opportunity mapping used across the U.S. as data and policy tools for leaders and advocates to advance a more equitable community while helping citizens hold decision-makers accountable (Chetty et al. 2016; Powell et al. 2007). This open-source decision-support tool is an interactive dashboard that maps multiple social factors (either independently, or in combinations selected by users) and supports data-enriched policy choices and outcomes (Abello 2019; Equity Center 2020; PolicyLink 2020). To build trust and long-term stewardship of the atlas, the tool must be created with the community and driven by community-expressed needs (Q1b, Q2a, Q3b). This co-production distinguishes the Equity Atlas from other data visualization platforms (e.g., CDC's social vulnerability index) through its engagement of intended users in both the production and dissemination processes, which ensures that local knowledge triangulates technical expertise to create something deeply relevant to community concerns (Bovaird 2007; Horney et al. 2016). Building on the experience of team members who prototyped a co-produced Equity Atlas for the Charlottesville (VA) region, we will use participatory methods to engage a wide cross-section of community members to define the metrics that will comprise the Social Equity Index (Q3a; Saija et al. 2017); the specific data could include social factors such as income, race, age, life expectancy, education, broadband access, and housing cost burden. The demographic data in the Social Equity Atlas, along with environmental data and models described above, will be integrated as core components in our Climate Equity Atlas.

Synthetic Information: Although environmental data are widely available at the household and parcel level, social information at this spatial resolution poses privacy issues to residents despite the obvious advantages it lends to policymakers and researchers. We will use an innovative technique to synthesize multiple sources of socio-economic data, including surveys and publicly available administrative records (e.g., American Community Survey, tax assessments, and others documented in the Data Management Plan), to construct community profiles at the parcel or household level. The use of synthetic populations is an approach that can retain aggregate population characteristics at larger community levels (e.g., Census block, neighborhood, farming sector) while constructing "synthetic" households using imputation methods without compromising privacy (McClure & Reiter 2012; Maynard-Etem 2019). We will use a Bayesian statistical model to generate synthetic households in a community (Wheaton et al. 2009). The method relies on multivariate imputation at the household level while controlling for co-varying factors (Zhang et al. 2014). Data collected on different spatial scales can be combined, and the derived statistical relationships allow us to aggregate over local spatial scales that can be tailored to the question (e.g., elevation) and are

relevant to policy making, rather than relying solely on Census designated tracts or county-level data. Given the heterogeneity of households and communities in the ESVA, we will segment the synthetic populations into socio-demographic subgroups linked spatially, and by information-flows, livelihood, and governance. Potential differences in risk perception, available information and resources, exposure, impact, and environmental decision making, will be statistically estimated, and spatially represented by synthetic population groups in the coupled socio-environmental model (Q2b).

Stakeholder Networks: To better understand how stakeholders share resources such as information, data, or views on climate adaptations, we will use social network analysis. This is an approach that examines social structures by conceptualizing networks as a collection of *nodes* that represent entities and *ties* (graph edges) that represent interactions between them (Fig. 3; Wasserman & Faust 1994). The use of social network analysis in stakeholder interactions can help determine which structures are most advantageous for coordinating sustainable forms of collective action (Q2c, Q3c) (Prell et al. 2009; Lienert 2013). For example, highly centralized networks may suffer from "group-think" while more decentralized networks may be able to test localized solutions that can, in turn, be transmitted to other parts of the network via weak ties (Crona & Bodin 2006). Similarly, network centrality measures reveal which actors are most connected, and which stakeholders may be the most effective knowledge brokers across disparate communities within the broader region. These knowledge brokers may have unique forms of social capital to bring stakeholders with competing interests together to mobilize against the broader threat of climate change (Lomas 2007; Feldman and Ingram 2009). Our primary data collection strategy is to administer surveys via online applications that generate and securely store network data about the organizations that stakeholders collaborate with on climate issues (Hogan et al. 2020). In turn, we can supplement these networks with relational data gathered from subsequent community workshops, interviews, administrative data, and public documents from stakeholders in the ESVA region. These historical network data may help to identify shared/divergent risks and assets (Q2a), establish longitudinal trends about synergies and antagonisms between different types of communities (Q2b), and illustrate how information flows throughout the broader network (Q2c, Q3b). We will formally analyze these relationships with statistical and inferential network analysis to coordinate solutions with community members (Q3c). In this sense, social network analysis will provide a formal infrastructure for data-driven feedback mechanisms to drive climate change policies.

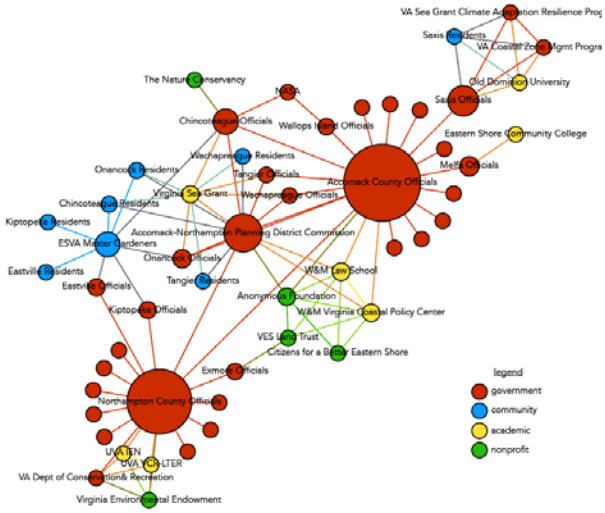


Fig. 3. An example network where nodes represent stakeholders and edges correspond to information that is shared between stakeholders. The node color aligns with different sectors and the node size corresponds to the centrality of nodes in the network. Network analysis is used detect key stakeholders and inform information flow, and to help stakeholders act based on their shared interests.

2.3. Coupled Social-Environmental Modeling

We will develop an agent-based model (ABM) that represents stakeholders' decision-making (e.g., land-use practices, water use) and their interactions to couple the environmental data and models (Section 2.1) with the socio-economic data and analyses (Section 2.2). By integrating both types of dynamics, the coupled model (Fig. 2) will allow us to capture the co-evolution of socio-economic and environmental systems at parcel to regional scales. Additionally, we will use this coupled socio-environmental model, together with the Community Equity Atlas, to generate and communicate "what-if" scenarios and explore decision alternatives (Q3c,d). To better represent stakeholders in the ABM, we will use the synthetic

information approach (Section 2.2) to construct agents' profiles. This allows us to account for different socioeconomic attributes of stakeholders while ensuring the ethical use of social data. Repetitive interactions among agents are among the main features of agent-based modeling (Bonabeau 2002). These interactions can happen (1) directly (e.g., in the form exchanging information), and (2) indirectly, (e.g., mediated through the environmental system). We will use the social networks of stakeholders extracted using social network analysis (Section 2.2) to represent these interactions in the ABM.

Another important feature of an ABM is formalizing agents' decision-making, which may include short-term (i.e., operational, e.g., groundwater use) and long-term decisions (i.e., adaptation, e.g., switching to salt-tolerant crops, land use change). Stakeholders' decision-making can be influenced by environmental stressors, their own experiences, information shared through the stakeholder networks, and experts (e.g., extension agents). To represent stakeholders' decision-making in the ABM, we will design and conduct decision experiments with the key ESVA stakeholders. Using decision experiments (also known as controlled laboratory experiments), we can observe stakeholders' decision-making process in hypothetical but reasonably realistic experiments (Sonka et al. 1988; Barham et al. 2015). We will set up the experiment as a decision-making game, and will also make it in the form of a web-based application so that it can be conducted online. We will rely on stakeholders' inputs in workshops and surveys to design the details of our experiment. We expect the decision experiment to reveal stakeholders' risk preferences, decision-making heuristics, information-processing heuristics, and learning styles.

2.4. Collaborative Decision-Support Platform and Data Science Infrastructure

Climate Equity Atlas: The Climate Equity Atlas is dynamically co-produced within the Coastal Hub Framework with socio-environmental data and modeling (stakeholder networks, synthetic information, agent-based model, surface/subsurface hydrology, storm surge), and community and researcher interaction to characterize current and alternative future scenarios (Fig. 2). While the Social Equity Atlas provides the baseline mapping of community assets and risks, the Climate Equity Atlas is novel in that it incorporates models "under the hood" to enable "what-if" discussions and predictions of alternative adaptation scenarios. The data analysis and modeling efforts collaboratively undertaken with the community contribute information for visualization in the Climate Equity Atlas. The Atlas will serve as a dynamic, public-facing decision support tool for community and researcher exploration of the distribution of environmental hazard, exposure, and equity (Q.1a,b,c), stimulating community feedback that will iteratively improve the Atlas and develop new queries to construct decision-making scenarios, and to build community adaptive capacity and equity (Q.3b,c,d). The Climate Equity Atlas provides visualization of model and data analysis outputs as community specified metrics through a user-friendly dashboard that community members can engage with during our workshops and data science trainings, and by the web. This capacity provides communication of results to community users, and feedback from the community to the research team on model performance, visualization, and utility. We note that the system is not designed as a formal risk analysis or optimization, but as a data and model informed framework for collaboration and negotiation.

The Climate Equity Atlas is an interactive platform where users can customize their queries based on selected metrics (e.g., specific socio-economic or environmental data layers), climate scenarios, and adaptation choices (Fig. 2). To be most useful, the decision support tool must employ linguistic frames and visual techniques most relevant to the intended users, and the community must have access to data literacy skills to understand how data can be used for empowerment and change. Software use cases and user profiles will be developed with the community to iteratively build utility across the community. For example, if a large organization catering to tourists and a small, disaggregated community of farmers were able to jointly recognize they are at risk from degraded groundwater source due to salinization, they can jointly explore different management options that may consolidate their assets to design and implement sustainable long-term intervention, despite having little else in common. Understanding who will be using the Climate Equity Analysis, what expected uses are, and the level of data literacy will be critical to developing a system serving a diverse community. We have previously developed similar software for use in participatory urban green infrastructure planning (Leonard et al., 2019), with intuitive visual design interfaces for users (stormwater engineers, community members) to set up advanced models of urban

stormwater to link design to outcomes. This Climate Equity Atlas could offer a particularly important mechanism for historically underrepresented populations to leverage data in a way that shows the disproportionate impact that climate change has on their communities. As we detail in Section 2.5, developing the skills and assets to use the platform is a key component of our Hub.

Data Science Infrastructure: To enable the development, improvement, and sustainability of the Climate Equity Atlas with ESVA communities, we will develop a data science infrastructure that community members can use to pool their data assets and distribute these resources to (select) stakeholders in their collaboration network. The specific products that are likely to result from this co-production process include: (1) a website that centralizes information from the data workshops such as contact details, scheduling, data assets, links to data analysis pipeline, and online tutorial materials; (2) a relational database management system (e.g. PostgreSQL database) that provides infrastructure to securely store data assets and distribute those data to (select) stakeholders; (3) data sharing agreements that document with whom data is shared and how data can be used; (4) an open-source code bank (e.g. a GitHub repository) that community members can use to carry out data analysis; and (5) the public-facing dashboard (Climate Equity Atlas) that maps assets/risks throughout the region and informs decision-making scenarios. While the implementation of this data infrastructure will happen in the initial stages of the project, we intend to train key stakeholders how to maintain, update, and expand this toolkit so that the Climate Equity Atlas can continue to be a dynamic and impactful tool for the ESVA region for many years after our involvement in creating the Hub has completed.

2.5. Stakeholder Engagement and Co-production for Salience and Sustained Relationships

Continuous engagement throughout the development of the Coastal Futures Hub will contribute to broader community buy-in, improved predictions, greater legitimacy and increased relevance of research findings and products, and increased acceptance, trust, and use of Climate Equity Atlas to support decision making (Fig.2). It will also strengthen relationships between researchers and the community, and among community members across the ESVA who participate. These connections and relationships are important for ensuring long-term impacts of the Coastal Futures Hub beyond the funding cycle, and for supporting transferability of our findings beyond the ESVA community. We will build on an existing relationship between the academic partners of the Hub and the ESVA Climate Adaptation Working Group (CAWG). Led by the Accomack-Northampton Planning District Commission, the CAWG coordinates efforts among local, state, and federal representatives of government, aquaculture, agriculture, conservation, and community organizations to better plan and mitigate risks associated with climate change. The Hub is uniquely positioned to support the mission of the CAWG to provide educational outreach and develop planning tools to assist local governments and residents, and for CAWG to lead the continued use of the Hub beyond the funding cycle (see Letter of Support).

Community Knowledge: One key strategy for facilitating this continuous engagement is to hire part-time "deep knowledge" residents, including members of traditionally underserved and vulnerable groups, who will participate in all Hub activities and will be liaisons with the community. These community leaders with "lived experience" will help design the plan for community engagements. They will play a vital role in ensuring the Hub effectively engages diverse voices, especially among community members from underrepresented groups who might not otherwise engage, in helping train community members to work with the data, and in supporting ongoing relationships of trust. Local leaders who are embedded in, and trusted by, the community also can be trained to conduct interviews with residents. Recruitment for these roles will build on partnerships with the Eastern Shore Community Services Board, Virginia Organizing, and Virginia Cooperative Extension.

Community Workshops and Focus Groups: The Hub will build on the experience and process of the RAFT that completed broad community resilience assessments in 2018-2019 with two counties and five towns on the ESVA. Initially, stakeholders will be identified based on the RAFT's existing knowledge of and experience with ESVA communities. To ensure broad participation, these stakeholders will be asked

to identify additional stakeholders to include in subsequent workshops. The workshops may include different creative designs, such as charrette-style activities that engage residents in participatory mapping of problem areas they wish to address, walk-abouts to examine issues on the ground (joint fact finding), focus groups to collaboratively identify issues relating to specific resident issues that may apply only to certain vulnerable or underrepresented populations, and participatory solution development and assessment workshops. Community residents will also be engaged in specific work groups that take deeper dives into examining data and model predictions, evaluating visualizations, developing key metrics for use in the Climate Equity Atlas, and exploring joint solutions with researchers. Working together, from the conceptualization of the issues and problems through to implementation of solutions, the Hub will provide a demonstration of how community participatory co-production of tools and solutions can yield more effective long-term approaches to climate change.

Training Stakeholders in Data Literacy: The Hub will also draw on our team's experience collaborating with diverse groups to promote community learning through data-driven discovery (Keller et al. 2018a,b). This approach emphasizes the discovery, integration, and repurposing of existing data sources to identify and address problems within local communities as well as share skills about how to address these issues using a data science framework. Building on our recent collaborations with Cooperative Extension Services in Iowa, Oregon, and Virginia (Keller et al. 2018a,b), we will develop and deliver trainings that promote several core competencies, including: (1) representing ideas through data insights; (2) the use of data-informed problem solving; (3) reasoning and assessing conclusions based on data-driven learning; (4) reflective thinking over data science-oriented problem solutions; (5) selecting tools and strategies; and (6) connecting and communication. These skills help promote community members' autonomy for determining which questions they want to address given their existing data assets and needs as well as what data must be collected to better address future concerns facing their communities.

Workshops will involve teaching community members how to identify novel or underutilized data sources (Q3a), use open-source tools to analyze data, interpret, and visualize model forecasts, and disseminate insights through online dashboards. While this data discovery process typically involves training participants on how to use low-cost publicly available data (e.g., American Community Survey) and tools (e.g., R, Python, or GitHub), community members may also be willing to pool additional data into a common repository for designated stakeholders. For example, local farmers may already collect data on soil salinization, but not know how to analyze those data effectively. Moreover, pooling of farmers' data could help to identify broader climate trends in the region. Importantly, we will help establish a relational database management system and data sharing agreements so that data and analysis tools can be shared based on how community members decide to allocate access to those resources (see Project Management and Data Management Plans). This form of data-driven governance helps community members define the most pressing problems facing their community, map and generate assets that address those concerns, and increase their capacity to engage in collective action based on who has access to these resources.

3. INTEGRATION and PARTNERSHIPS

3.1. Academic Partners

The Coastal Futures Hub leverages priorities and strengths of the participating institutions in coastal adaptation and resilience, participatory research, stakeholder engagement, and environmental equity. Below we describe the key academic partners at the three participating institutions and their contributions to the integrated research plan of the Coastal Futures Hub. Project team members, their disciplines, and responsibilities are detailed in the Supplements (Project Personnel, Project Management).

Several research partners will participate from the **University of Virginia**; some have a history of successful collaboration and others are leveraged through this proposed CoPe Hub. Environmental Resilience is one of the five strategic research priorities at UVA. The Environmental Resilience Institute brings expertise in effective practices for team science and multi-sector collaborations. The Institute for Engagement & Negotiation (now in its 40th year), is part of an interdisciplinary collaborative with the William & Mary Law School, and Old Dominion University (ODU), that conceived and developed the

RAFT. Its team of facilitators and certified mediators have developed trusted relationships across multiple sectors through their previous work on the ESVA; they will play a critical role in identifying and incentivizing community members to participate. The Social & Decision Analytics Division at UVA's Biocomplexity Institute addresses complex social problems by leveraging the diversity of public data flows available, and uses data science to improve the impact of decision making for the public good. They will lead the social network analysis, decision-based scenario modeling, and training of community members in data literacy. UVA's Equity Center will lead the development of the Social Equity Atlas. In addition to these institutional collaborations, the Hub leverages research of individual scholars in watershed and groundwater hydrology, oceanography, remote sensing, agent-based socio-environmental modeling, and ecosystem dynamics, and of the UVA-led VCR LTER project (Section 3.3).

The Virginia Coastal Policy Center (VCPC) at **William & Mary** Law School will be a key collaborator in identifying and working with community partners by leveraging the RAFT process. VCPC provides science-based legal and policy analysis of ecological issues affecting the state's coastal resources, providing education and advice to Virginia's decision-makers, from government officials and legal scholars to non-profit and business leaders.

Old Dominion University's Institute for Coastal Adaptation & Resilience (ICAR) will also be a key collaborator in community engagement and policy analysis. ODU ICAR also hosts the Virginia Sea Grant Climate Adaptation & Resilience Program that is part of a national network of boundary-spanning organizations connecting research and science with federal, state, and local government and private industry, NGOs, and civil society.

3.2. Non-Academic Partners

The Hub team will partner with community entities active on the ESVA representing governmental, economic, environmental, and residential interests. Local, regional, state, and federal governmental entities include nineteen town governments, two county governments, one planning district commission, multiple state agencies, and multiple federal agencies. We are building on existing relationships representing these different sectors with: the Accomack-Northampton Planning District, Departments of Natural Resources and Environmental Quality, the Chamber of Commerce, Eastern Shore Community Services Board, Virginia Cooperative Extension, Virginia Organizing, Citizens for a Better Eastern Shore, The Nature Conservancy, Eastern Shore Chapter of the Master Naturalists and Master Gardeners, and the Virginia Eastern Shore Land Trust. Through these connections, UVA's over 30+ year presence on the ESVA with the VCR LTER program, and the RAFT group's experience, we will also reach educators, faith-based organizations, full-time and seasonal residents, absentee landowners, and visitors/tourists for input. The Climate Action Working Group (Section 2.5) already coordinates interests of many EVSA stakeholders and will be a key partner for the CoPe Hub.

3.3 Partnerships Leveraging NSF Investments

The proposed Hub leverages partnerships built from NSF investments in four interdisciplinary projects focused on coastal adaptation and resilience on the ESVA. These include: (1) the **Virginia Coast Reserve Long Term Ecological Research project** (1987-present), which is a primary source of long-term data and models for the Hub on sea-level rise, tide levels, storm surge, and ecosystem state change. (2) An **interdisciplinary Coastal Science, Engineering, and Education for Sustainability (SEES) project** (2015-2020) that addressed how climate forces and community adaptation decisions affect the long-term sustainability of salt marshes at three LTER sites along the U.S. Atlantic Coast, including the VCR LTER. It involved a collaboration between researchers in ecology, geomorphology, oceanography, economics, and anthropology from six institutions. The work integrated stakeholder workshops, biophysical modeling, analysis of public perceptions and values from focus groups, economic analysis, and charrettes with policy-makers and stakeholders to present and evaluate modeled outcomes of different adaptation choices. Communities identified the most valued benefits of salt marshes on the ESVA to be "cultural", including aesthetics and "sense-of-place". (3) A **second Coastal SEES project** examining the linkages and feed-backs between human and natural components of coastal shorescapes in Virginia and how they inform

policies and decisions regarding shoreline user behavior such as the implementation of living shorelines (2016-2021). It focuses on how the natural system drives behavior of shoreline stakeholders (e.g., property owners, wetlands boards, etc.) and how changes in behavior and/or governance systems may result in different decisions affecting the resilience of natural and human systems. And (4) A **Coastal Resilience National Research Training grant** for Team Science Training for Coastal Ocean and Estuarine STEM graduate students (2018-2021), with the ESVA as one of two study areas. The project is piloting an innovative approach to introduce STEM graduate students to the science-of-team-science, reflective practices, and leadership training to enhance transdisciplinary collaborative research.

3.4 Partnerships Broadening Participation

The Coastal Futures Hub will leverage existing relationships to create partnerships for collaborative knowledge production and local capacity-building, and increase access to STEM education, in ways that especially support traditionally underserved and vulnerable people. *This will directly benefit the rural ESVA communities and enhance long-term climate adaptation, in an area where the household income is half the state average, the poverty rate is twice the state average, and both counties are majority-minority districts with all Title 1 public schools, where >70% of students receive lunch support (Fig. 1).*

Knowledge Production

Engaging Local Leaders: The Hub will explicitly recruit leaders from lower income communities and communities of color in the region who are most likely to be disproportionately impacted by climate change who will be liaisons with the community. The Hub fundamentally commits to an ethic of co-production in the research process to include the lived expertise of traditionally underserved and vulnerable communities. This sort of local knowledge is often absent from climate science, and will open up the research to new ways of understanding its relevance to action and will distribute power more evenly to disrupt patterns of climate inequity. We will hire one leader (YR 1) who will be part of the Hub leadership team, and this leader will help coordinate a team (YR 2-5) who together will carry the project forward.

Narratives and Community Events: We will work with local community leaders and educators to facilitate narratives, through words, art, and soundscapes that will help both researchers and decision-makers understand diverse perspectives and visions for the future. These storylines will have place-based links to the Climate Equity Atlas, and will leverage a collaboration between UVA's Environmental Humanities Coastal Conservatory, Environmental Resilience Institute, and the VCR LTER. Community events (YR 3-4) in local art and historic spaces (e.g., At Altitude Gallery, Barrier Island Center) where we have previously held events (>100 people) will engage the broader community.

Education and Local Workforce Development

Learning in Places Curriculum: We will engage K-12 students and local families in the Learning in Places (LiP) curriculum, which incorporates local ways of knowing and builds inquiry skills to support decision making, reflecting the overall goals of the Hub. Using a curriculum suitable for classroom or community-based learning, our programs will be nimble and able to reach students representative of the majority-minority counties through partners and programs they already trust. This supports our commitment to an "early and often" approach to enhance receptivity to STEM fields and increase science literacy. We will use brief pre-/post-experience surveys to assess changes in attitudes and understanding, and geographic distribution of participants to infer demographics as a metric of equitable engagement.

Research Experiences for High School Students: We will use a *tiered mentoring model* connecting faculty, graduate and undergraduate students, and high school students. Leveraging the education program of the VCR LTER, the project will engage two high school students per year as Coastal Futures Interns. These students will work as research assistants to Hub activities during the summer and will be intentionally recruited through community and teacher partnerships to enhance participation of traditionally underrepresented groups.

Research Experiences for Undergraduates: Many local students from the ESVA attend the academic institutions that are collaborating on this proposal. We will provide opportunities for two undergraduate students to work with the project team each summer. To ensure that our REUs contribute to

diverse perspectives on the project, we will: (1) advertise via pathwaystoscience.org, ESA SEEDS, and Eastern Shore Community College; (2) include a prompt regarding sense of place in the application; and (3) use a review rubric to guide the selection of students who have the most to gain from the experience while contributing to the diversity of project personnel.

***Data Science for the Public Good Young Scholars*:** Our group offers an annual 11-week Data Science for the Public Good Young Scholars Program where graduate and undergraduate students work with researchers, multi-sector stakeholders, and local leaders on developing data-driven solutions to local community issues. One graduate and two undergraduate students from Coastal Futures Hub each summer will collaborate with others in this experiential learning program. In 2020 we led a three-state coalition with five universities involving 60 students who worked on 32 research projects.

4. METRICS of SUCCESS and EVALUATION

The Project Management Plan, including a timeline of the specific tasks for each objective of the Coastal Futures Hub is included as a Supplemental Document. An outside evaluator, Partnerships for Sustained Impact, has been retained to monitor the intellectual merit and the broader impacts of the Hub in collaboration with the research team. There will be an annual evaluation to track progress of research products, equity and representativeness, academic outputs, community capacity gains, and overall health of the collaboration. Data collected for the Hub evaluation will be managed in accordance with the Hub's Data Management Plan (Supplemental Document). Key metrics of success include: (1) how the demographics of engaged community members reflect the demographics of the Eastern Shore population; (2) number of community leaders and members recruited from traditionally underrepresented populations and neighborhoods disproportionately impacted by saltwater intrusion and flooding; (3) number of events community members participate in as measure of continued engagement; (4) the degree to which those engaged helped expand the circle of engagement to others in their spheres of influence (e.g. neighborhoods, schools, professional networks, social networks); (5) use (repeat and new) of the Coastal Futures Hub website and Climate Equity Atlas; and (6) evidence of adaptation implementation and policy adoption.

Activities involved in the creation of the Hub's open-source decision-support platform will be evaluated through an Appreciative Inquiry approach and documented as outlined in the Hub's Strategic Impact Map (Fig. 4). This approach asks individuals from the community and research team through interviews and surveys to reflect on their experiences with the research process, team members, and interactions among their cohort. Input on the value of activities, challenges, relationship building, adaptive capacity, and impacts on the community will be gathered in-stream as part of focus groups, co-produced modeling workshops, and data literacy training events (Section 2.5). The effectiveness of these Hub activities will be monitored through post-event pulse-surveys to capture how community members use the Climate Equity Atlas and the relational databases. Training activities are designed to increase data literacy,

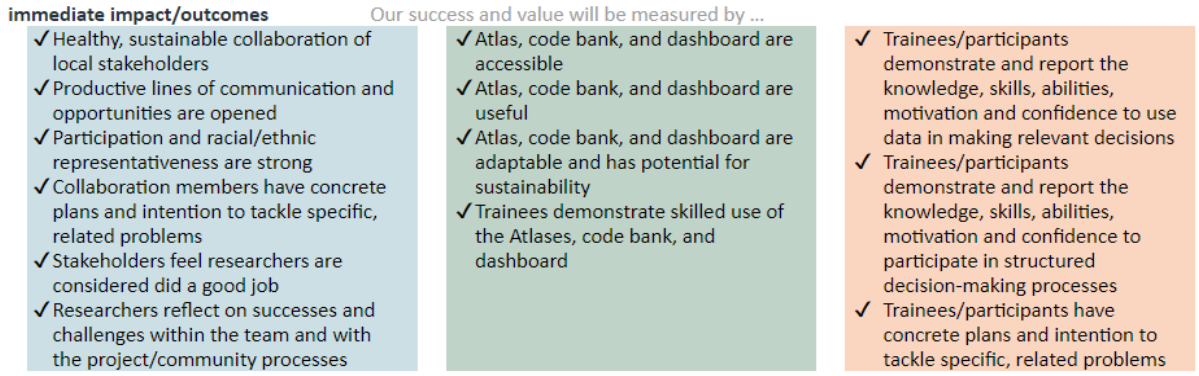


Fig. 4. Excerpt from the Coastal Futures Hub Strategic Impact Map (SIM) developed by Partnerships for Sustained Impact, illustrating how project activities produce immediate and community level impacts. The Hub SIM monitors the health of collaborations, the usefulness of the data platform, and the capacity of decision tools that result in equitable decisions and policy impacting climate adaptation.

and prepare participants with the knowledge, skills, and abilities necessary to maintain the utility of the Climate Equity Atlas beyond the life of the project. The stakeholder engagement objective of the Hub will expand the engagement of underrepresented populations to broaden participation and give voice to diverse community members and maintain healthy partnerships through community leaders, focus groups, and workshops that shape the research and outcomes (Section 2.5). Demographic information of community members will be documented and cataloged at each event hosted by the research team through a combination of self-reported and observer-collected formats (Hunnings 2013). The research team will monitor representativeness of study participants and work in partnership with local leaders to recruit additional contacts to broaden representation.

5. BROADER IMPACTS

Advancing Societally Important Research: This Coastal Futures Hub addresses two critical challenges in increasing adaptive capacity and resilience of coastal communities through *convergent research and community co-production.* These are: (1) the need to couple environmental hazard and risk assessment with an understanding of the social and economic factors that influence behaviors and decision-making; and (2) the need to provide information and decision-support tools for rural communities that are currently underserved by scientific research and communication. Rural coastal communities and economies are especially vulnerable to the impacts of sea-level rise and storms, which have disproportionate effects on traditionally underserved communities, particularly those of color. Finding evidence-based solutions that are realistic and actionable requires bringing together research experts from diverse fields with community members that represent many sectors, from households to industry to government. The ESVA is a model system that leverages long-term data records, research, and multi-sector collaborations to understand how an integrated network of researchers, stakeholders, policy makers, and educators can build rural capacity to deal with rapid environmental change. The Coastal Futures Hub framework developed in this project can be transferred to other rural coastal regions similarly impacted by climate.

Co-producing a Collaborative Infrastructure for Decision-Support: Our Coastal Futures Hub framework includes data infrastructure, socio-environmental analyses and models, visualization tools, and a web interface that culminate in the interactive Climate Equity Atlas. This open-source decision-support platform is designed to *increase public scientific literacy and engagement with STEM*, and help multi-sector stakeholders generate questions and *explore adaptation and policy options*. It is intentionally designed to help *create shared goals and metrics, build lasting partnerships, support local leaders, and enhance coordination and communication that will allow the Hub to be sustainable and thrive beyond the funding cycle* (NSF Includes Report 2020). Community members will benefit from training in data literacy. Feedbacks from the community in curating data, understanding information flows and community interactions, modeling future scenarios, and using the interactive tool will *enhance both the research and platform development and amplify voices not typically engaged in the climate dialogue*.

Enhancing Diversity, Equity, and Inclusion: Our education programs engage students from middle school to graduate school, and are designed to *broaden participation of traditionally underrepresented groups.* This is especially true for the K-12 programs that are serving the regional communities where socio-economic indicators are well below the state average (Fig. 1), and both ESVA counties are majority-minority school districts. We will leverage the highly successful Virginia Coast Reserve LTER Schoolyard Education and Outreach program which connects with every high school student twice before graduation. Undergraduate and graduate students and the post-doctoral fellow will be receive training in integrative modeling, data science, visualization techniques, and participatory research methods. All are *key skills for transdisciplinary and collaborative team research.* We will identify and *partner with local leaders with "lived experience"*, and will explicitly recruit leaders from communities most vulnerable to climate change to serve as liaisons. All aspects of the Hub framework will be co-produced with the community. In this way, the Coastal Futures Hub will *invest in diverse community voices and intentionally broaden representation and share power* with underserved communities that have generally not be part of the climate dialogue (CEOSE 2017-2018 Report to Congress). The continuous engagement and shared power will give the Hub greater legitimacy and salience to support actionable solutions over the long term.

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Karen J. McGlathery
Department of Environmental Sciences, University of Virginia

(a) Professional Preparation:

Connecticut College	New London, CT	Ecology	B.A., 1981
Cornell University	Ithaca, NY	Ecology and Systematics	Ph.D., 1992
Danish Nat'l Env Res Inst	Silkeborg, DK	Coastal Marine Science	1992 – 1994
University of Copenhagen	Hillerod, DK	Coastal Marine Science	1992 – 1994

(b) Appointments:

2017 – present	Director, Environmental Resilience Institute
2014 – 2018	Associate Vice President for Research, Sustainability & the Environment, University of Virginia
2008 – present	Professor, Department of Environmental Sciences, University of Virginia
2002 – 2008	Associate Professor, Department of Environmental Sciences, University of Virginia
1996 – 2002	Assistant Professor, Department of Environmental Sciences, University of Virginia
1994 – 1995	Danish National Science Foundation Postdoctoral Fellow, Danish National Environmental Research Institute
1992 – 1994	NSF-NATO Postdoctoral Fellow, Danish National Environmental Research Institute and University of Copenhagen
1981 – 1986	Program Officer and Associate Director, Center for Field Research at Earthwatch, Inc.

(c) Products:

Five most relevant publications:

Oreska, M.P.J., K.J. McGlathery, L. Aoki, P. Berg, A. Berger. 2020. Net greenhouse gas benefits of the Virginia eelgrass (*Zostera marina*) restoration: a seagrass blue carbon case study. Nature Scientific Reports. https://doi.org/10.1038/s41598-020-64094-1

Carr, J., G. Mariotti, S. Fagherazzi, K. McGlathery, and P. Wiberg. 2018. Exploring the impacts of seagrass on coupled marsh-tidal flat morphodynamics. Frontiers in Environmental Science, 03 September 2018 | https://doi.org/10.3389/fenvs.2018.00092

Carr, J. A., P. D'Odorico, K. J. McGlathery and P. L. Wiberg. 2016. Spatially explicit feedbacks between seagrass meadows, sediment and light: habitat suitability for seagrass growth. Advances in Water Research. doi:10.1016/j.advwatres.2015.09.001.

McLoughlin, S. M., P. L. Wiberg, and K. J. McGlathery. 2014. Rates and forcing of marsh-edge erosion in a shallow coastal bay: Virginia. Estuaries and Coasts doi: 10.1007/s12237-014-9841-2.

McGlathery, K. J., P. D'Odorico, S. Fagherazzi, M. Pace and M. Reidenbach. 2013. Nonlinear dynamics and alternate stable states in shallow coastal systems. Oceanography 26(3): 220–231, http://dx.doi.org/10.5670/oceanog.2013.66.

Five other significant publications:

Oreska, M.P.J., K.J. McGlathery, L. Aoki, P. Berg, A. Berger. 2020. Net greenhouse gas benefits of the Virginia eelgrass (*Zostera marina*) restoration: a seagrass blue carbon case study. Nature Scientific Reports. https://doi.org/10.1038/s41598-020-64094-1

Macreadie,, P.I., A. Anton, J.A. Raven, N. Beaumont, R.M. Connolly, D.A. Friess, J.J. Kelleway, H. Kennedy, T. Kuwae, P.S. Lavery, C.E. Lovelock, D.A. Smale, E.T. Apostolaki, T.B. Atwood, J. Baldock, T.S. Bianchi, G.L. Chmura, B.D. Eyre, J.W. Fourqurean, J.M. Hall-Spencer, M. Huxham, I.E. Hendriks, D. Krause-Jensen, D. Laffoley, T. Luisetti, N. Marbà, P. Masque, K.J. McGlathery, P.J. Megonigal, D. Murdiyarso, B.D. Russell, R. Santos, O. Serrano, B.R. Silliman, K. Watanabe, C.M. Duarte. 2019. The future of

blue carbon science. Nature Communications. https://doi.org/10.1038/s41467-019-11693-w
Lunstrum, A., K. McGlathery, and A. Smyth. 2017. Oyster (*Crassostrea virginica*) aquaculture shifts sediment nitrogen processes toward mineralization over denitrification. Estuaries and Coasts. DOI 10.1007/s12237-017-0327-x
Reynolds, L.K., M. Waycott, K. J. McGlathery, R.J. Orth. 2016. Ecosystem services returned through restoration. Restoration Ecology. DOI: 10.1111/rec.12360
Fourqurean, J. W., C. M. Duarte, H. Kennedy, N. Marba, M. Holmer, M. A. Mateo, E. T. Apostolaki, G. A. Kendrick, D. Krause-Jensen, K. J. McGlathery, and O. Serrano. 2012. Global carbon stocks in seagrass ecosystems. Nature – Geosciences. doi: 10.1038/NGEO1477.

(d) Five Synergistic Activities:

Director, Environmental Resilience Institute, University of Virginia: Established and direct pan-University institute focused on catalyzing transdisciplinary actionable research across UVA's 12 schools and building partnerships for community co-production of solutions-oriented research on environmental change.

Training/Curriculum development: Developed multi-disciplinary courses linking science, design, economics, engineering, policy and law (Coastal Resilience, Water and Watershed Resilience, Climate Resilience), in addition to disciplinary courses (Global Coastal Change, Coastal Oceanography, Methods in Aquatic Ecology, Estuarine Ecology, Fundamentals of Ecology, Ecology of Aquatic Plants, Tropical Ecology, Tropical Marine Ecology, Biodiversity and Conservation)

Member, Research and Education Advisory Committee, Virginia Sea Grant: Working with leaders of eight research universities in Virginia to advise Virginia Sea Grant on funding priorities for coastal research and graduate fellowships, including new multi-disciplinary and team science programs

Lead Principal Investigator, Virginia Coast Reserve Long Term Ecological Research (LTER) program, 2004 - present

Associate Editor, Ecosystems 2006 – present, Journal of Phycology 1999 – 2004

NSF BIOGRAPHICAL SKETCH

NAME: Lawrence, Band

ORCID: 0000-0003-0461-0503

POSITION TITLE & INSTITUTION: Ern Professor of Environmental Science, Professor of Engineering Systems and Environment, University of Virginia

(a) PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
SUNY@Buffalo	Buffalo, New York	Geography	BA	1977
UCLA	Los Angeles, California	Geography	MA	1979
UCLA	Los Angeles, California	Geography	PHD	1983

(b) APPOINTMENTS

2017 - present	Ern Professor of Environmental Science, Professor of Engineering Systems and Environment, University of Virginia, Charlottesville, VA
1998 - 2017	Voit Gilmore Distinguished Professor of Geography, University of North Carolina, Chapel Hill, Chapel Hill, NC
1994 - 1998	Professor, University of Toronto, Toronto
1989 - 1994	Associate Professor, University of Toronto, Toronto
1987 - 1989	Assistant Professor , University of Toronto, Toronto
1983 - 1987	Assistant Professor, Hunter College, City University of New York, New York, NY

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

1. Leonard L, Miles B, Heidari B, Lin L, Castronova A, Misker B, Lee J, Scaife C, Band L. Development of a participatory Green Infrastructure design, visualization and evaluation system in a cloud supported jupyter notebook computing environmen. Environmental Modeling and Software. 2019; 111:121-133. Available from: https://doi.org/10.1016/j.envsoft.2018.10.003
2. Rai A, Minsker B, Sullivan W, Band L. A novel computational green infrastructure design framework for hydrologic and human benefits. Environmental Modeling & Software. 2019; 1188:252-261. Available from: https://doi.org/10.1016/j.envsoft.2019.03.016
3. Duncan J, Welty C, Kemper J, Groffman P, Band L. Dynamics of nitrate concentration-discharge patterns in an urban watershed. Water Resources Research. 2017; 53(8):273-288.
4. Duncan J, Band L, Groffman P. Variable nitrate concentration–discharge relationships in a forested watershed. Hydrological Processes. 2017; 31(9):1817-1824.
5. Miles B, Band L. Green infrastructure stormwater management at the watershed scale: urban variable source area and watershed capacitance. Hydrological Processes. 2015; 29(9):2268-2274.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Dukes E, Galloway J, Band L, Cattaneo L, Groffman P, Leach A, Castner E. A community nitrogen footprint analysis of Baltimore City, Maryland. Environmental research letters. 2020; 15(7).

2. Gorelick D, Lin L, Zeff H, Kim Y, Coulston J, Wear D, Band L, Reed P, Characklis G. Accounting for Adaptive Water Supply Management When Quantifying Climate and Land Cover Change Vulnerability. Water Resources Research. 2020; 56(1).
3. Tashie A, Scaife C, Band L. Transpiration and subsurface controls of streamflow recession characteristics. Hydrological Processes. 2019; 33(19):2561-2575.
4. Lin L, Band L, Vote J, Hwang T, Miniat C, Bolstad P, z. Ecosystem processes at the watershed scale: Influence of flowpath patterns of canopy ecophysiology on emergent catchment water and carbon cycling. Ecohydrology. 2019; 12(5).
5. Hwang T, Martin K, Vote J, Wear D, Miles B, Kim Y, Band L. Nonstationary hydrologic behavior in forested watersheds is mediated by climate-induced changes in growing season length and subsequent vegetation growth. Water Resources Research. 2018; 54(8):5359-5375.

(d) SYNERGISTIC ACTIVITIES

1. Member, Review Team for the Chesapeake Bay Watershed Model – Phase 6, Chesapeake Bay Program, 2016

2. External Review, Department of Geography, National University Singapore, 2017

3. Participant, sub-committee chair for watershed hydrologic science, Chesapeake Bay Program planning for 2025 Chesapeake Bay Watershed Model Phase 7.

4. Committee Member, Co-author, National Climate Assessment 4, chapter on forests (2017-2018)

5. North Carolina Nutrient Sensitive Waters Advisory Board, 2012-2017,

NAME: Barbara Brown Wilson

POSITION TITLE & INSTITUTION: Associate Professor, Urban and Environmental Planning, UVA

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
University of North Carolina	Chapel Hill, NC	Art History	B.A.	2002
University of Texas	Austin, TX	Architectural History	M.A.	2005
University of Texas	Austin, TX	Community and Regional Planning	Ph.D.	2010

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2020- Present	Associate Professor, Urban and Environmental Planning, Faculty Director, The Equity Center, University of Virginia
2014-2020	Assistant Professor, Urban and Environmental Planning, University of Virginia
2011-2014	Assistant Professor, Community and Regional Planning/Sustainable Design, University of Texas at Austin

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

1. Wilson, B.B. (2018). Resilience for All: Striving for Equity Through Community-Driven Design. Washington, D.C.: Island Press.
2. Equity Center. 2020. Democratization of Data Covid Decision-Support Tool: How Easily Can You Shelter in Place?, accessed at https://virginiaequitycenter.github.io/cvilleequity_covid/SIP/ on September 3.
3. Howell, K. and Wilson, B.B. "Preserving Community through Radical Collaboration: Affordable Housing Preservation Networks in Chicago, Washington, DC and Denver," Housing, Theory, and Society, (July 2018).
4. Moore, S.A., Wilson, B.B. (2013). Questioning Architectural Judgment: The Problem of Codes in the United States, Routledge: London.
5. Walsh, Elizabeth and Barbara B. Wilson, "Crises, Movements, & Paradigm Shifts: Propositions for a Spectrum of Collective Power for Climate Justice," in Learning from Arnstein's Ladder: From Citizen Participation to Public Engagement, Eds. Mickey Lauria and Carissa Slotterback, Routledge: RTPI Library Series, 2020.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Howell, Kathryn Elizabeth Mueller, and Barbara B. Wilson, "One Size Fits None: Local Context and Planning for the Preservation of Affordable Housing," Housing Policy Debate, Volume 29, no 1, December 2018.
2. Wilson, Barbara B. "Planning Note: Redefining Sustainability: The Gulf Coast Community Design Studio," The Journal of the American Planning Association, Volume 80, no 4, p398, 2015.
3.Wilson, B.B. (2015). "Before the 'Triple Bottom Line': New Deal Defense Housing as Proto-Sustainability," Journal of Planning History, Volume 14, no. 1, pp. 4-18.
4. Wilson, Barbara B. "East Austin Oaks: The Limits of Participatory Planning in the Space Age," Journal of Planning History, April 20, 2020.

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

1. Serving as Co-founder and Faculty Director of Equity Center at the University of Virginia (2018-present)
2. PI for "Designing a Community-Engaged Approach to Pre- Development Social Impact Analysis," funded by the Surdna Foundation (2018)
3. Building Pipeline Program for Charlottesville underrepresented youth to explore STEAM learning opportunities related to equitable land use, funded by National Endowment for the Arts (2018) and Jessie Ball Dupont Fund (2016-2018)
4. Co-Founder of the Design Futures Student Leadership Forum (2013-2018)
5. Vice President, Board of Directors, Piedmont Housing Alliance (2016-present)

NSF BIOGRAPHICAL SKETCH

NAME: Korkmaz, Gizem

ORCID: 0000-0002-4947-6320

POSITION TITLE & INSTITUTION: Research Associate Professor, University of Virginia

(a) PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Bogazici University	Istanbul	Economics	BA	2005
Bogazici University	Istanbul	Economics	MA	2008
European University Institute	Florence	Economics	PHD	2012
Virginia Tech	Blacksburg, Virginia	Network Science & Data Science	Postdoctoral Fellow	2013 - 2014

(b) APPOINTMENTS

2018 - present Research Associate Professor, University of Virginia
2018 - present Adjunct Faculty, Department of Agriculture and Applied Economics, Virginia Tech
2014 - 2018 Research Assistant Professor, Biocomplexity Institute, Virginia Tech
2013 - 2014 Postdoctoral Associate, Virginia Bioinformatics Institute, Virginia Tech

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

1. Keller SA, Shipp SS, Schroeder AD, Korkmaz G. Doing data science: A framework and case study. Harvard Data Science Review. 2020 January 31; 2(1).
2. Keller S, Korkmaz G, Robbins C, Shipp S. Opportunities to observe and measure intangible inputs to innovation: Definitions, operationalization, and examples. Proc Natl Acad Sci U S A. 2018 Dec 11;115(50):12638-12645. PubMed PMID: 30530693; PubMed Central PMCID: PMC6294952.
3. Pires B, Korkmaz G, Ensor K, Higdon D, Keller S, Lewis B, Schroeder A. Estimating Individualized Exposure Impacts from Ambient Ozone Levels: A Synthetic Information Approach. Environmental Modeling and Software. 2018; 103(146):157.
4. Keller S, Shipp S, Korkmaz G, Molfino E, Goldstein J, Lancaster V, Pires B, Higdon D, Chen D, Schroeder A. Harnessing the Power of Data to Support Community-Based Research. WIREs Computational Statistics. 2018 May; 10(3).
5. Keller S, Korkmaz G, Orr M, Schroeder A, Shipp S. The Evolution of Data Quality: Understanding the Transdisciplinary Origins of Data Quality Concepts and Approaches. Annual Review of Statistics and Its Application. 2017; 4(1):85-108.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Kelling C, Graif C, Korkmaz G, Haran M. Modeling the Social and Spatial Proximity of Crime: Domestic and Sexual Violence Across Neighborhoods. Journal of Quantitative Criminology. 2020 March 30; DOI: 10.1007/s10940-020-09454-w

2. Korkmaz G, Capra M, Craig A, Kuhlman CJ, Lakkaraju K, Vega-Redondo F. Coordination and Collective Action on Communication Networks. Proc. of the 17th ACM International Conf. on Autonomous Agents and Multi-agent Systems (AAMAS). 2018 July 15; :1062-1070.
3. Korkmaz G, Cadena J, Kuhlman CJ, Marathe A, Vullikanti A, Ramakrishnan N. Multi-Source Models for Civil Unrest Forecasting. Soc Netw Anal Min. 2016;6PubMed PMID: 30344793; PubMed Central PMCID: PMC6192062.
4. Arnsbarger M, Goldstein J, Kelling C, Korkmaz G, Keller S. Modeling Response Time to Structure Fires. The American Statistician. 2019 December 23; 10(7):1-9.
5. Korkmaz G, Kuhlman C, Ravi SS, Vega-Redondo F. Spreading of Social Contagions without Key Players. World Wide Web. 2017 September 21; 21:1187–1221.

(d) SYNERGISTIC ACTIVITIES

1. Dr. Korkmaz integrates her background in economics with data science by blending traditional and novel data sources (text-based data, social media) and methods (e.g., network analysis, machine learning) to ask how we can make data useful for people and communities. She is passionate about the development of a workforce using data science to contribute to community-based research. She is the co-director of UVA's Data Science for the Public Good Young Scholars Program. https://biocomplexity.virginia.edu/social-decision-analytics/dspg-program

2. Contributed extensively to network theory, game theory, social network analysis, and behavioral economics. Network science contributions (both mathematical modeling and empirical analysis) include applications in collaboration and communication networks, online social networks, among others. She received the Outstanding New Faculty Award from Virginia Tech Faculty Association in Dec. 2016. She is the PI of a Minerva grant funded by the US Air Force Office of Scientific Research, and Co-PI of a DARPA-funded project in the Computational Simulation of Online Social Behavior program that studies individual behavior on online social networks such as GitHub and Reddit. Dr. Korkmaz developed network-based statistical models to predict critical societal events (protests, strikes) in targeted countries as part of IARPA's Open Source Indicator program. Activities resulted in publications in journals and peer-reviewed proceedings.

3. Contributed to measurement of innovation activities, in particular of open source software innovation using non-survey opportunity data (collected from online registries, repositories and databases). Dr. Korkmaz is part of a US Department of Agriculture funded project titled: "Use of Statistical and Survey Methodology Research to Improve or Redesign Surveys" in collaboration with National Center for Science and Engineering Statistics (NCSES) at the NSF. Current findings have been published in journals including PNAS, and presented at international conferences such as the General Conference of the International Association for Research in Income and Wealth (IARIW 2018), the International Monetary Fund (IMF) Statistical Forum on Measuring Economic Welfare in the Digital Age, and the 2018 IEEE/ACM International Conference on Advances in Social Network Analysis and Mining (ASONAM). This work is also part of the National Bureau of Economic Research (NBER) Conference on Research in Income and Wealth (CRIW) on Big Data for 21st Century Economic Statistics.

NAME: Venkataraman Lakshmi

POSITION TITLE & INSTITUTION: Professor Engineering Systems and Environment, University of Virginia

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
Indian Institute of Technology	Roorkee	Civil Engineering	BS	1987
University of Iowa	Iowa City	Civil and Environmental Engineering	MS	1989
Princeton University	Princeton	Civil and Environmental Engineering	PhD	1996

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2019	Professor, Engineering Systems and Environment, University of Virginia
2017-2018	Program Director, Hydrologic Sciences, National Science Foundation
2015-2016	Cox Visiting Professor, Department of Geophysics, Stanford University
08/2015	Visiting Professorial Fellow, School of Civil and Environmental Engineering, University of New South Wales, Australia
04-07/2015	Cox Visiting Professor, Department of Geophysics, Stanford University
2006-2018	Professor, Department of Earth and Ocean Sciences University of South Carolina
2008-2011	Chairman Department of Earth and Ocean Sciences University of South Carolina
2003-2006	Associate Professor, Department of Earth and Ocean Sciences University of South Carolina
1999-2003	Assistant Professor, Department of Earth and Ocean Sciences University of South Carolina
2006-2007	Cox Visiting Professor, Department of Geophysics, Stanford University
1996-1999	NASA Goddard Space Flight Center Research Scientist
1990-1996	Research Assistant, Department of Civil and Environmental Engineering, Princeton University

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

(1) Fang, B., V. Lakshmi, R. Bindlish, T. Jackson, M. Cosh and J. Basara, Passive Microwave Soil moisture downscaling using vegetation index and surface temperatures, Vadose Zone Journal, doi:10.2136/vzj2013.05.0089, 2013
(2) Fang, B., Lakshmi, V., Soil Moisture at Watershed Scale: Remote Sensing Techniques (2014), Journal of Hydrology, 516 (2014) pp. 258–272
(3) Billah, M. M., J. Goodall, U. Narayan, J, Reager, V Lakshmi and J. Famiglietti, A methodology for evaluating evapotranspiration estimates at the watershed-scale using GRACE, Journal of Hydrology (2015), doi: http://dx.doi.org/10.1016/j.jhydrol.2015.01.06, Vol. 523, pp. 574-586
(4) Lakshmi, V, Beyond GRACE: Use of satellite for groundwater investigations, Technical Note, Groundwater, doi: 10.1111/gwat.12444, 2016
(5) Lakshmi, V., J Fayne and J Bolten, A comparative study of available water in the major river basins of the world, Journal of Hydrology, 567, pp. 510-532, https://doi.org/10.1016/j.jhydrol.2018.10.038, 2018

Other Significant Products, Whether or Not Related to the Proposed Project

(1) Libertino, A., A Sharma, V Lakshmi and P Claps, Ability of TRMM and GPM to characterize timing of extreme precipitation, 11(5):054003. DOI:10.1088/1748-9326/11/5/054003, Environmental Research Letters, 2016
(2) Al-Barakat, R., V Lakshmi and C Tucker, Using satellite remote sensing to study the impact of climate and human changes Mesopotamia marshlands, Iraq, Remote Sensing, 10, 1524; doi:10.3390/rs10101524, 2018
(3)Fang, B., V Lakshmi, R Bindlish and T Jackson, 2018, Downscaling of SMAP soil moisture using temperature and vegetation data, doi:10.2136/vzj2017.11.0198, Vadose Zone Journal, 2018
(4)Mohammed, I., J Bolten, R Srinivasan and V Lakshmi, 2018, Improved hydrological decision support system for the Lower Mekong River Basin using satellite-based earth observations. 10, 885, doi:10.3390/rs10060885, , Remote Sensing, 2018

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

(1) American Geophysical Union - chair of the Chapman conference Program (2013-2015), member AGU Meetings Committee (2013-2015), Chair, Hydrology Section, Fall Program Co-Chair, 2006-2008 and Chairman, Remote Sensing Technical Committee.
(2) Board of Directors, Consortium of Universities for Advancement of Hydrological Sciences (CUAHSI)
(3) Global Hydrology and Water Resources Panel, National Academy Decadal Survey
(4) Chair of the Workshop Planning Committee, National Academies, "Groundwater Recharge and Flow: Approaches and Challenges for Monitoring and Modeling Using Remotely Sensed Data", member serving on the Water Science and Technology Board of the National Academies
(5) Editor, Vadose Zone Journal; Chief Editor Remote Sensing in Earth System Science

NAME: Elizabeth Andrews

POSITION TITLE & INSTITUTION: Professor of the Practice and Director, Virginia Coastal Policy Center

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
The College of William & Mary	Williamsburg, VA	Anthropology	B.A.	1984
Washington College of Law, The American University	Washington, D.C.	Law	J.D., Summa Cum Laude	1993

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
February 2016 to Present	Director, Virginia Coastal Policy Center, William & Mary Law School, Williamsburg, VA
November 2013 to February 2016	Water Policy Manager, Virginia Department of Environmental Quality, Richmond, VA
March 2007 to November 2013; Served as Section Chief from March 2010	Senior Assistant Attorney General and Section Chief, Environmental Section, Virginia Office of the Attorney General, Richmond, VA

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

Elizabeth Andrews & Jesse Reiblich, Reflections on Rural Resilience: As the Climate Changes, Will Rural Areas Become the Urban Backyard?, William & Mary Environmental Law & Policy Review, (Spring 2020).

Angela King, Elizabeth Andrews, Kelsey Thwaits & James Loyd, Guidance Materials on Starting or Expanding an Aquaculture Operation (January 2019).

Elizabeth Andrews & Angela King, Managing Use Conflicts on the Lynnhaven River (November 2018).

Morris Foster, James O'Donnell, Mark Luckenbach, Elizabeth Andrews, Emily Steinhilber, John Wells & Mark Davis, Institutionalizing Resilience in U.S. Universities: Prospects, Opportunities, and Models, 52:2 Marine Technology and Science Journal 106 (March/April 2018).

Donna M. Bilkovic, Molly Mitchell, Jenny Davis, Elizabeth Andrews, Angela King, Pam Mason, Julie Herman, Navid Tahvildari & Jana Davis, Review of Boat Wake Wave Impact on Shoreline Erosion and Potential Solution for the Chesapeake Bay, STAC Publication 17-002 (May 12, 2017),

Other Significant Products, Whether or Not Related to the Proposed Project

Elizabeth A. Andrews, Roy A. Hoagland & Jonathan R. Lubrano, The 2016 Stormwater Bill: An Analysis of Perceived and Real Problems with Proposed Solutions, Final Report 111716-ED (2016).

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

Virginia Academy of Science, Engineering, and Medicine Study Board, Board Member (2020)

Chesapeake Bay Program, Climate Resiliency Workgroup, Appointed Virginia Representative (2018 to present)

The Resilience Adaptation Feasibility Tool (RAFT), Member of Academic Collaborative Team (2016 to present)

ADAPTVA, Member of Project Team (2016 to present)

The Science of Team Science, Member of Multi-Disciplinary Team of Faculty Facilitators (2018 to present)

NAME: Michele Claibourn

POSITION TITLE & INSTITUTION: Director, Research Data Services, UVA Library

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
University of Wisconsin-Madison	Madison, WI	Political Science	Ph.D.	2002
University of Wisconsin-Madison	Madison, WI	Political Science	M.A.	1996
Rice University	Houston, TX	Political Science	B.A.	1993

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2015-Present	*Director, Research Data Services & Social, Natural, Engineering Sciences, UVA Library, University of Virginia, Charlottesville, VA
2020-Present	*Lead Data Scientist, Equity Center, University of Virginia, Charlottesville, VA
2019-Present	*Faculty Affiliate/Lead Data Scientist, Global Policy Center, Batten School of Leadership and Public Policy, University of Virginia, Charlottesville, VA
2014-2015	* Associate Director for Data Infrastructure and Services, Data Science Institute, University of Virginia, Charlottesville, VA
2013-2015	* Director, StatLab and Research Data Services, UVA Library, University of Virginia, Charlottesville, VA
2011-2013	* Data Scientist, Weldon Cooper Center for Public Service, University of Virginia, Charlottesville, VA
2004-2011	* Assistant Professor, Department of Politics, University of Virginia, Charlottesville, VA
2002-2005	* Instructor, ICPSR Summer Program in Quantitative Methods, University of Michigan, Ann Arbor, MI
2002-2004	* Assistant Professor, Department of Political Science, University of Oklahoma, Norman, O

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

* Claibourn, Michele P. and Sam D. Powers. 2020. Charlottesville Region COVID Equity and Recovery Datahub. https://virginiaequitycenter.github.io/cvilleequity_covid/. [Github: https://github.com/virginiaequitycenter/cvilleequity_covid/]
* Claibourn, Michele P. and Charlotte McClintock. 2019. Regional Equity Dashboard Prototype. https://commpaslab.shinyapps.io/cville-region/. [Github: https://github.com/commpaslab/equity-dashboard]
* Martin, Paul S. and Michele P. Claibourn. 2013. Citizen Participation and Congressional Responsiveness: New Evidence for Why Participation Matters. Legislative Studies Quarterly 38: 59-82.
* Claibourn, Michele P. and Paul S. Martin. 2007. The Third Face of Social Capital: How membership in Voluntary Associations Improves Policy Accountability. Political Research Quarterly 60: 192-201.
* Claibourn, Michele P. and Paul S. Martin. 2000. Trusting and Joining: An Empirical Test of the Reciprocal Nature of Social Capital. Political Behavior 22: 267-291.

Other Significant Products, Whether or Not Related to the Proposed Project

* Claibourn, Michele P. 2011. Presidential Campaigns and Presidential Accountability. University of Illinois Press.
* Claibourn, Michele P. 2012. Hearing Campaign Appeals: The Accountability Implications of Campaign Tone Political Communication 29: 64-85.
* Claibourn, Michele P. and Paul S. Martin. 2012. Creating Constituencies: Presidential Campaigns, the Scope of C
* Claibourn, Michele P. 2008. Making a Connection: Repetition and Priming in Campaigns. Journal of Politics 70: 1142-1159.
* Claibourn, Michele P., Charlotte McClintock, and the Public Interest Data Lab. 2019. Charlottesville Foster Care Study. Report to the Charlottesville Department of Social Services. https://doi.org/10.18130/v3-ztey-hn31

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

* Co-Director, Community Policy, Analytics, and Strategy Lab, Batten School of Leadership and Public Policy, University of Virginia, 2018-Present, working with community partners on community-centered research needs.
* Faculty affiliate in Global Policy Center, collaborating with Save the Children, International's Migration and Displacement to develop predictive models of forced displacement.
* MAPP2Health Data Evaluation Committee, Thomas Jefferson Health District, Virginia, 2019-2020.
* REU Mentor, School of Data Science, Summer 2019.
* Public Interest Data Lab, providing data science experience to students in service of the public interest, 2018-2020.

NAME: Teresa Birnbaum Culver

POSITION TITLE & INSTITUTION: Associate Professor, University of Virginia

A. PROFESSIONAL PREPARATION

(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
Cornell University	Ithaca, NY	Environmental Technology	B.S.	1984
Cornell University	Ithaca, NY	Environmental Engineering	M.S.	1989
Cornell University	Ithaca, NY	Environmental Engineering	Ph.D.	1891

B. APPOINTMENTS

(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2018-present	Director of Undergraduate Studies in Civil Engineering, U. of Virginia, Charlottesville, VA
2000-present	Associate Professor of Civil Engineering, U. of Virginia, Charlottesville, VA
2003-2018	Associate Chair for Undergraduate Programs in Civil Eng., UVa, Charlottesville, VA
1993-2000	Assistant Professor of Civil Engineering, U. of Virginia, Charlottesville, VA
1992-1993	Lecturer, Civil Engineering, Cornell University, Ithaca, New York

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

1) Baker, R. and T.B. Culver, Locating nested monitoring wells to reduce model uncertainty for management of a multi-layer coastal aquifer, Jounal of Hydrologic Engineering, 15 (10), 763- 771, 2010.
2) Zell, W.O., T.B. Culver, and W.E. Sanford (2018). Prediction uncertainty and data worth assessment for groundwater transport times in an agricultural catchment, Journal of Hydrology, doi: https://doi.org/10.1016/j.jhydrol.2018.02.006
3) Zell, W.O., T.B. Culver, W.E. Sanford and J.L. Goodall, Quantifying Background Nitrate Removal Mechanisms in an Agricultural Watershed with Contrasting Subcatchment Base-flow Concentrations, Journal of Environmental Quality, 2020, 49 (2), doi: 10.1002/jeq2.20049
4) Mobley, J.T., T.B. Culver, and T.E. Hall, Simulation-Optimization for the Design of Outlet Control Structures for Ecological Detention Ponds, J. Water Resour. Plann. Manage., 2014, 140(11), 04014031, DOI: 10.1061/(ASCE) WR.1943-5452.0000420.
5) Reis, J., T.B. Culver, P.J. Block, and M.P. McCartney, Evaluating the impact of uncertainty of reservoir operation for malaria control as the climate changes in Ethiopia, Climatic Change, 2016, 136, 601-614, DOI 10.1007/s10584-016-1639-8

Other Significant Products, Whether or Not Related to the Proposed Project

1) Mobley, J.T. and Culver, T.B., Design of Outlet Control Structures for Ecological Detention Ponds, J. Water Resour. Plann. Manage., 140(2), 250-257, 2014.
2) Jia, Y. and T.B. Culver, Robust Optimization for Total Maximum Daily Load Allocations, Water Resources Research, Vol. 42. W02412, doi:10.1029/2005WR004079, 2006
3) Jia, Y. and T.B. Culver, Uncertainty analysis for watershed modeling using generalized likelihood uncertainty estimation with multiple calibration measures, Journal of Water Resources Planning and Management, 134(2), 97-106, 2008. doi: 10.1061/(ASCE)0733-9496(2008)134:2(97).
4) Chan Hilton, A.B. and T.B. Culver, Groundwater remediation design under uncertainty using genetic algorithms, Journal of Water Resources Planning and Management, 25-34, 131(1), 2005

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

Friendship Court Youth Leadership Program - Developed and led green infrastructure and stormwater workshops for under-privileged youth to support resident engagement in redevelopment of their community
Monitoring and Analysis of Sustainable Stormwater Management - Led students studying local best management practices in collaboration with the Rivanna River Basin Commission, the local city, county and the university's Facilities department. Developed a community-based undergraduate course where engineering students worked to address the stormwater-related needs of community partners. Over 120 undergraduate students have addressed real local stormwater challenges. Outreach at the city high school, where 50% of the students are from ethnic and racial minorities, has introduced over 150 high schoolers to the field of water resources engineering, through hands-on laboratories, field trips and lectures by university students.

Tanya Denckla Cobb
Director, Institute for Engagement & Negotiation
P.O. Box 400179, University of Virginia, Charlottesville, VA 22904-4179
Phone: 434-270-0951 E-mail: td6n@virginia.edu

A. PROFESSIONAL PREPARATION

Smith College	Northampton, MA	Government	B.A.1978
George Washington University	Washington, D.C.	Pre-Med	1998-2001
Virginia Certified Mediator #0054	Virginia Supreme Court	General District, J&D, Circuit Family and Circuit Civil Courts	1993-2011

B. ACADEMIC/PROFESSIONAL APPOINTMENTS

2015-present	Director, Institute for Engagement & Negotiation (*formerly Institute for Environmental Negotiation),* University of Virginia
2001-present	Lecturer, Department of Urban & Environmental Planning, School of Architecture, University of Virginia
2008-2015	Associate Director, Institute for Environmental Negotiation, University of Virginia
1997-2008	Senior Associate, Institute for Environmental Negotiation, University of Virginia
1993-2011	Certified Mediator, Virginia Supreme Court (for all court levels) (#0054)
1996-2010	Mediator, Mediator Mentor and Trainer, Community Mediation Center of Charlottesville, and also co-founder of James River Mediation Associates
1995-1996	Executive Director, Virginia Urban Forest Council
1995	Outreach Coordinator (FEMA grant-funded), Virginia Department of Forestry
1991-1995	Mediator, Community Mediation Center, Harrisonburg, VA
1991-1995	Executive Director, Greener Harrisonburg
1984- 1994	Writer, Publisher, Wooden Angel Communications
1978-1984	International Labor Relations Officer, U.S. Department of Labor

C. PRODUCTS

<u>5 Most Relevant Publications</u>

Goodman, Ann. 2020 (forthcoming). *Collaborating for Climate Resilience.* Andrews, Elizabeth and Tanya Denckla Cobb, Michelle Covi, and Angela M. King. Chapter in "*Communities: Teaming with Companies, Cities, States, Academia (The RAFT).*" Routledge.

"Summary Report of the Model Ecosystem Restoration and Conservation Collaboratives Project," Weaver, Kristina and Tanya Denckla Cobb, and Michael Foreman. For the National Fish & Wildlife Foundation, June 2019.

O'Leary, Amy and John S. Miller, Rick D. Youngblood, David B. Cook, Shelley L. Wynne, and Tanya Denckla Cobb. 2020. *Using Performance Measures to Strengthen Public Involvement in Identifying Targeted Transportation Investments.* Transportation Research Record, 1-18.

"Community DECISION: Stakeholder focused watershed planning," Bosch, Darrell and James Pease, Mary Leigh Wolfe, Christopher Zobel, Javier Osorio, Tanya Denckla Cobb, Greg Evanylo. 2012.

Journal of Environmental Management, Vol 112 (2012) 226-232.

Addor, Mary Lou and Tanya Denckla Cobb, Franklin Dukes; Michael Ellerbrock, and L. Steve Smutko. 2005. "Linking Theory to Practice: A Theory of Change Model of the Natural Resources Leadership Institute." *Conflict Resolution Quarterly*, Vol. 23, No. 2, Winter.

Five Other Significant Products (relating to collaboration)

Denckla Cobb, Tanya and Shantell Bingham. Springer, 2021. "The Art of the Town-Gown Dance: Healing Legacies of Harm in our Food System through Equitable Engagement Pedagogy." Chapter in *Planning for Urban Agriculture in the USA: Future Directions for a new Ethic in City Building,* edited by Samina Raja, Brandon Born, Marcia Caton Campbell, Alfonso Morales, Alexandra Judelsohn.

Timothy Beatley, Carla Jones, and Reuben Rainey. 2018. *Healthy Environments, Healing Spaces: Practices and Directions in Health, Planning and Design.* Denckla Cobb, Tanya and Carla Jones, "Community Food Interventions for Healing: The Cases of Janus Youth and Lynchburg Grows." UVA Press.

Four NFWF Local Capacity Building Projects: 1) Middle Peninsula Regional Stormwater Program, May 2014; 2) City of Petersburg Stormwater Program, May 2014; 3) Upper Shenandoah MS4 Stormwater Program, January 2014; 4) Evitts Run Green Infrastructure Park, Charles Town, May 2014.

Recommendations to Strengthen Nutrient Management Planning on Virginia Farms, prepared for Sustainable Chesapeake, 2017.

"Community Food Interventions for Healing: The Cases of Janus Youth and Lynchburg Grows." Chapter with Carla Jones in *Healthy Environments, Healing Spaces: Practices and Directions in Health, Planning and Design,* edited by Timothy Beatley, Carla Jones, and Reuben Rainey (UVA Press: 2018).

D. FIVE SYNERGISTIC ACTIVITIES (relating to collaboration, conflict resolution, and evaluation)

Co-founder, The Resilience Adaptation Feasibility Tool and The RAFT Scorecard, 2015-present. The RAFT is a collaborative, community-driven process and full-service tool developed by the UVA Institute for Engagement & Negotiation in partnership with the Virginia Coastal Policy Center at the William & Mary Law School and the Old Dominion University/Virginia Sea Grant Resilience Collaborative. https://raft.ien.virginia.edu/

Designing and facilitating community engagement: Lower Chickahominy Watershed Project – developing a long-term plan for economic, environmental and social resilience, including training for local governments in consulting with local Virginia tribes, 2018 – present.

Member of three National Practitioner Rosters providing collaboration, mediation, facilitation services to the USG: the U.S. Institute for Environmental Conflict Resolution; the U.S. EPA Conflict Prevention and Resolution Center; and US Department of Interior Collaborative Action and Dispute Resolution.

Training development and delivery on collaboration, community engagement, consultation: Training for USAF in American Indian Communication and Tribal Consultation, for USAF Installation Commanders and staff, 2019-present. Three collaboration trainings for NOAA (Chesapeake Bay Office, Restoration Center, and Habitat Protection Center) on 1) group facilitation, 2) conflict resolution, and 3) negotiation and facilitation. 2016-17.

Curriculum development and teaching on community engagement and collaboration: Co-founder and teaching faculty for the Virginia Natural Resources Leadership Institute, since 1999. Develop curriculum that exposes Fellows to collaborative approaches to multi-dimensional "wicked" environmental problems, and teach conflict resolution, collaborative problem-solving, and conflict management styles. Teach 3-day seminar for National Preservation Institute in Conflict Resolution and Negotiation Skills for Cultural and Natural Resources Management, since 2006.

NSF BIOGRAPHICAL SKETCH **OMB-3145-0058**

NAME: Joshua Goldstein

NSF ID: 000799151

POSITION TITLE & INSTITUTION: Research Assistant Professor,Biocomplexity Institute Social and Decision

A. PROFESSIONAL PREPARATION

List undergraduate and graduate education and postdoctoral training. List the year the degree was received as well as inclusive dates of postdoctoral training. Institution name, Location, Major/Area of Study, Degree (if applicable), Year

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
Lafayette College	Easton, PA	Physics, Math	B.S.	2007
Pennsylvania State University	State College, PA	Statistics	Ph.D	2015

B. APPOINTMENTS

List, in reverse chronological order, all academic/professional appointments beginning with the current appointment. Start/End Year of Appointment, Position Title, Organization, City, State, Country

From - To	Position Title, Organization and Location
2018-present	Research Assistant Professor, Social & Decision Analytics Division, Biocomplexity Institute, University of Virginia, Arlington, VA
2015-2018	Research Scientist, Social & Decision Analytics Laboratory, Biocomplexity Institute of Virginia Tech, Arlington, VA
2015-2018	Postdoctoral Fellow, Social & Decision Analytics Laboratory, Biocomplexity Institute of Virginia Tech, Arlington, VA

C. PRODUCTS

Acceptable products must be citable and accessible including but not limited to publications, data sets, software, patents, and copyrights. Unacceptable products are unpublished documents not yet submitted for publication, invited lectures, and additional lists of products. Each product must include full citation information including (where applicable and practicable) names of all authors, date of publication or release, title, title of enclosing work such as journal or book, volume, issue, pages, website and Uniform Resource Locator (URL) or other Persistent Identifier.

Products Most Closely Related to the Proposed Project

Goldstein, J., Park, J., Haran, M., Liebhold, A., and Bjørnstad, O. N. 2019. Quantifying spatio-temporal variation of invasion spread. Proceedings of the Royal Society B, 286(1894), 2018-2294.
Keller, S., Shipp, S., Korkmaz, G., Molfino, E., Goldstein, J., Lancaster, V., Pires, B., Higdon, D., Chen, D., and Schroeder, A. 2018. Harnessing the Power of Data to Support Community-Based Research. Wiley Interdisciplinary Reviews: Computational Statistics 10.3 (2018): e1426.
Park, J., Goldstein, J., Haran, M., and Ferrari, M. (2017). "An ensemble approach to predicting the impact of vaccination on rotavirus disease in Niger," Vaccine, 35(43), 5835-5841.
Goldstein, J., Haran, M., Simeonov, I., Fricks, J., and Chiaromonte, F. (2015). "An attraction-repulsion point process model for respiratory syncytial virus infections," Biometrics 71:376-86

Other Significant Products, Whether or Not Related to the Proposed Project

Pires, B., Goldstein, J., Higdon, D., Reese, S., Sabin, P., Korkmaz, G., Ba, S., Hamall, K., Koehler, A., Shipp, S., and, Keller, S. (2017). "A Bayesian Simulation Approach for Supply Chain Synchronization", in the post-proceedings of the 2017 Winter Simulation Conference (WSC), 3rd – 6th December, Las Vegas, NV.
Pires, B., Goldstein, J., Molfino, E. and Ziemer, K. "Exploring Dynamic, Multi-Level Interactions within an Organization: An Agent-based Modeling Approach," in the post-proceedings of the Computational Social Science Conference, 19th–22nd October, 2017, Santa Fe, NM.
Goldstein, J., Molfino, E., Keller, S., Higdon, D. (2016). "Uniqueness Assessment for American Housing Survey Records: a Pseudouniverse Approach," Social and Decision Analytics Laboratory in the Biocomplexity Institute of Virginia Tech.

D. SYNERGISTIC ACTIVITIES

List up to five distinct examples that demonstrate the broader impact of the individual's professional and scholarly activities that focus on the integration and transfer of knowledge as well as its creation.

Mentored students and led student teams over four summers 2015-2018 as part of the Social and Decision Analytics Division's Data Science for the Public Good program. These included multiple teams of undergraduate and graduate students in collaborations with the Arlington County Fire Department and Police Department, Fairfax County Department of Neighborhood and Community Services, U.S. Army Research Institute for Behavioral and Social Science Research and others. Directed the process of data discovery, profiling, exploration, and statistical analysis, which led to the creation of posters for a symposium, reports, and publications.
Instructor for Stat 401 'Experimental Methods', The Pennsylvania State University, State College, PA, 2014 – 2015.

NAME: Majid Shafiee-Jood

POSITION TITLE & INSTITUTION: Research Assistant Professor - University of Virginia

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
Sharif University of Technology	Tehran, Iran	Civil Engineering	B.Sc.	2010
Sharif University of Technology	Tehran, Iran	Water Resources Engineering	M.Sc.	2012
University of Illinois at Urbana-Champaign	Urbana, IL	Civil Engineering/Water Resources Engineering and Science	Ph.D.	2019
University of Illinois at Urbana-Champaign	Urbana, IL	Coupled Natural and Human Systems	Postdoctoral	2019-2020

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2020 - Present	Research Assistant Professor, University of Virginia, Charlottesville, VA
2019-2020	Postdoctoral Research Associate, University of Illinois at Urbana-Champaign, Urbana, IL

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

- Shafiee-Jood, M., T. Deryugina, and X. Cai (2020). A Behavioral Social Learning Model for Studying the Dynamics of Forecast Adoption. Under Review in Water Resources Research. Available at ESSOAr. doi: 10.1002/essoar.10502740.1
- Johnson, M., S. Saksena, L. Yeghiazarian, V. Merwade, S. Arumugam, S. Back, J. Bales, X. Cai, D. Fils, T. Hahmann, J. Horsburgh, Z. Huang, R. Huang, A. Mazrooei, K. Onda, R. Ranjithan, S. Riasi, S. Rice, M. Shafiee-Jood, A. Shepherd, P. Singhofen, S. Stephan, D. Tarboton, and A. Tartakovsky (2020). Moving from Information to Insight by Linking Urban and Hydrologic Systems through the Urban Flooding Open Knowledge Network. IMPACT, 22(2), 19-21.
- Shafiee-Jood, M., M. Housh and X. Cai (2018). Hierarchical decision modeling framework to meet environmental objectives in biofuel development. J. Water Resources Planning and Management, 144(7), 04018030. doi: 10.1061/(ASCE)WR.1943-5452.0000950
- Cai., X., K. Wallington, M. Shafiee-Jood and L. Marston (2018). Understanding and managing FEW nexus: Opportunities for water resources research. Advances in Water Resources, 111, 259-273. doi: 10.1016/j.advwatres.2017.11.014
- Shafiee-Jood, M., X. Cai, L. Chen, X.-Z. Liang, and P. Kumar (2014). Assessing the value of seasonal climate forecast information through an end-to-end forecasting framework: Application to U.S. 2012 drought In Central Illinois. Water Resources Research, 50(8), 6592-6609. doi: 10.1002/2014WR015822

Other Significant Products, Whether or Not Related to the Proposed Project

- Madani, K. and M. Shafiee-Jood (2020). Socio-hydrology: A new understanding to unite or a new science to divide. Water, 12(7), 1941. doi: 10.3390/w12071941
- James, L. D. and M. Shafiee-Jood (2017). Interdisciplinary information for achieving water security. Water Security, 2, 19-31. doi: 10.1016/j.wasec.2017.10.001
- Shafiee-Jood, M. and X. Cai (2016). Reducing food loss and waste to enhance food security and environmental sustainability. Environmental Science & Technology, 50(16), 8432-8443. doi: 10.1021/acs.est.6b01993
- Cai, X., X. Zhang, P. Noél, and M. Shafiee-Jood (2015). Impact of climate change on agricultural water management: A review. Wiley Interdisciplinary Reviews: Water, 2(5), 439-455. doi: 10.1002/wat2.1089

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

- Knowledge Transfer: Partnered with Illinois Farm Bureau, University of Illinois Extension, and Illinois State Climatologist's office to better understand Central Illinois farmers' information needs and deliver timely, usable, and salient weather/climate information to them.
- Innovation in Teaching: Used game-based learining in my class to teach key concepts in water resources management, such as conflict, cooperation, tragedy of the commons, and decision making.
- Academic Service: Regularly chair a session in ASCE's EWRI congress on forecast informed decision making; Member of a ASCE's EWRI Task Committee on Using Hydroclimatic Predictions in Water Systems Operation.
- Community Engagement: Co-founded the Illinois Water Day in 2014, an annual event that that aims to raise public awareness of water resources issues and provide a platform to facilitate discussions and collaboration regarding local water issues between researchers and the community in the Champaign County, IL.

Patricia L. Wiberg
Department of Environmental Sciences
University of Virginia

(a) Professional Preparation

Brown University, Providence, RI	Mathematics	B.A., 1976
University of Washington, Seattle, WA	Oceanography	M.S., 1982
University of Washington, Seattle, WA	Oceanography	Ph.D., 1987

(b) Appointments

2001-present Professor, Department of Environmental Sciences, University of Virginia
2009-2014 Chair, Department of Environmental Sciences, University of Virginia
1995-2001 Associate Professor, Dept. of Environmental Sciences, University of Virginia
1990-1995 Assistant Professor, Dept. of Environmental Sciences, University of Virginia
1987-1990 Research Associate, Dept. of Geological Sciences, University of Washington

(c) Products

Five most relevant publications

Blum, L.K., R.R. Christian, P.L. Wiberg, D.R. Cahoon, 2020. Processes influencing elevation and high marsh conversion to low marsh in a temperate saltmarsh. *Estuaries and Coasts*, doi.org/10.1007/s12237-020-00796-z

Wiberg, P.L., S. Fagherazzi, M.L. Kirwan. 2020. Improving predictions of salt marsh evolution through better integration of data and models. Annual Reviews of Marine Science 12:389-413, doi:10.1007/s12237-020-00796-z

Wiberg, P.L., S.R. Taube, M.R. Kremer, M.A. Reidenbach, A.E. Ferguson, 2019. Wave attenuation by oyster reefs in shallow coastal bays. Estuaries and Coasts 42: 331–347, doi: 10.1007/s12237-018-0463-y

Castagno, K.A., A.M. Jiménez-Robles, J.P. Donnelly, P.L. Wiberg, M.S. Fenster, S. Fagherazzi, 2018. Intense storms increase the stability of tidal bays, Geophysical Research Letters 45, doi: 10.1029/2018GL078208

McLoughlin, S.M., P.L. Wiberg, I. Safak, and K.J. McGlathery, 2015. Rates and forcing of marsh edge erosion in a shallow coastal bay. Estuaries and Coasts, doi: 10.1007/s12237-014-9841-2.

Five other significant publications

Aoki, L.R., K.J. McGlathery, P.L. Wiberg, A. Al-Haj, 2020. Depth affects seagrass restoration success and resilience to marine heat wave disturbance. *Estuaries and Coasts,* doi:10.1007/s12237-019-00685-0.

Carr, J.A., G. Mariotti, S. Fagherazzi, K.J. McGlathery, P.L. Wiberg, 2018. Exploring the impacts of seagrass on coupled marsh-tidal flat morphodynamics. Frontiers in Environmental Science 6:92. doi: 10.3389/fenvs.2018.00092

Safak, I., P.L. Wiberg, M.O. Kurum and D.L. Richardson, 2015. Controls on residence time and exchange in a system of shallow coastal bays. Continental Shelf Research 97: 7-20, DOI 10.1016/j.csr.2015.01.009.

McLoughlin, S.M., P.L. Wiberg, I. Safak, K.J. McGlathery, 2015. Rates and forcing of marsh edge erosion in a shallow coastal bay. *Estuaries and Coasts*, doi: 10.1007/s12237-014-9841-2.

Fagherazzi, S., G. Mariotti, P. L. Wiberg and K. J. McGlathery, 2013. Marsh collapse does not require sea level rise. Oceanography 26 (3).

Synergistic Activities

Signatory co-PI, Virginia Coast Reserve (LTER) program, 2006 - present

Editorial Committee, Annual Reviews of Marine Science, 2020 – 2024

Member, Advisory Board, Sediment Workgroup, Regional Monitoring Program for Water Quality in San Francisco Bay, 2019-

Member, Steering Committee, CSDMS (Community Surface Dynamics Modeling System, NSF), 2020 - 2022

Member, Executive Committee, AGU Earth & Planetary Surface Processes Focus Group, 2009-2022

NAME: Juita-Elena (Wie) Yusuf

POSITION TITLE & INSTITUTION: Professor of Public Service, Old Dominion University

A. PROFESSIONAL PREPARATION
(see PAPPG Chapter II.C.2.f.(i)(a))

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
Univ. of Notre Dame	Notre Dame, IN	Chemical Engineering	Bachelor of Science	1999
Indiana Univ.	Fort Wayne, IN	Business Administration	MBA	2002
Univ. of Kentucky	Lexington, KY	Public Administration	PhD	2007

B. APPOINTMENTS
(see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2019-present	Professor of Public Service, College of Business, Old Dominion Univ, (ODU), Norfolk, VA
2018-present	Assistant Director, ODU Institute for Coastal Adaptation & Resilience, Norfolk, VA
2016-2018	Chair, Resilience Collaborative Steering Committee, ODU , Norfolk, VA
2014-2019	Associate Professor of Public Service, College of Business, Old Dominion Univ, (ODU), Norfolk, VA
2008-2014	Assistant Professor of Urban Studies and Public Administration, College of Business and Public Administration, ODU, Norfolk, VA
2007-2008	Post-Doctoral Scholar & Research Associate, Gatton College of Business & Economics, Univ. of Kentucky, Lexington, KY
2004-2007	Research Associate, Kentucky Transportation Center, University of Kentucky, Lexington, KY

C. PRODUCTS

(see PAPPG Chapter II.C.2.f.(i)(c))

Products Most Closely Related to the Proposed Project

1. Yusuf, J., B. St. John III, P. Rawat, M. Covi, J.G. Nicula and C. Considine. 2019. The Action-Oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) Framework: An Effective, Field-tested Approach for Engaging Stakeholders in Building Resilience. Journal of Environmental Studies and Sciences 9(4): 409-418.
2. Yusuf, J., B. St. John III, J.G. Nicula, and M. Covi. 2018. Engaging Stakeholders in Planning for Sea Level Rise and Resilience: A Case Study of a Region-wide, Multi-sectoral, Whole-of-Community Action-Oriented Approach. Journal of Contemporary Water Research and Education, 164(1): 112-123.
3. Yusuf, J. and B. St. John III. 2016. Stuck on Options and Implementation in Hampton Roads, Virginia: An Integrated Conceptual Framework for Linking Adaptation Capacity, Readiness, and Barriers. Journal of Environmental Studies and Sciences 7(3): 450-460.
4. St. John III, B. and J. Yusuf. 2019. Perspectives of Experts and Experienced on Regional Adaptation for Sea Level Rise: Implications for Multi-Sectoral Readiness and Boundary Spanning. Coastal Management 47(2): 151-168.
5. Yusuf, J., M. Covi, C. Considine, B. Saint John III, M.M. Jordan, and J.G. Nicula. 2018. Toward a Whole-of-Government and Whole-of-Community Approach for Regional Adaptation to Sea Level Rise: Lessons Learned from the Hampton Roads Intergovernmental Pilot Project. In C. Schelly & A. Banerjee (eds.), Environmental Policy and Pursuit of Sustainability (pp. 47-62). Routledge.

Other Significant Products, Whether or Not Related to the Proposed Project

1. Considine, C., M. Covi, J. Yusuf. 2017. Building Resiliency to Sea Level Rise for an Urban Base and Surrounding Socio Ecological System. American Journal of Climate Change 6(2): 385-402.
2. Yusuf, J., P. Rawat, C. Considine, M. Covi, B. St. John III, J.G. Nicula, K. Anuar. 2018. Participatory GIS as a Tool for Stakeholder Engagement in Building Resilience to Sea Level Rise: A Demonstration Project. MTS Journal, 52(2):45-55.
3. Usher, L.E., J. Yusuf, M. Covi. 2019. Assessing Tourism Business Resilience in Virginia Beach. International Journal of Tourism Cities, 6(2): 397-414.
4. Yusuf, J.,M. Sloan. 2015. Effectual Processes in Non-profit Start-ups and Social Entrepreneurship: An Illustrated Discussion of a Novel Decision Making Approach. American Review of Public Administration 45(4): 417-435.

D. SYNERGISTIC ACTIVITIES

(see PAPPG Chapter II.C.2.f.(i)(d))

1 Assistant Director for Education for the ODU Institute for Coastal Adaptation & Resilience
2. Chair of the ODU Career Pathways program, a university-wide program that provides professional and career development opportunities for graduate students and postdoctoral scholars.
3. Develop and teach online graduate level public policy, public administration and nonprofit management courses
Coordinate the Hampton Roads Adaptation Forum, quarterly meetings to facilitate regional coordination and exchange of best practices among adaptation and resilience professionals in Hampton Roads, Virginia
Member of the Planning Committee for the Hampton Roads Resilience Forum, a regionwide event targeted at policymakers, businesses, nonprofit and community organizations, and residents to provide an overview of sea level rise and flooding issues.

CoPe Focused Hub:
Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities

BUDGET NOTES

PERSONNEL:

Academic Faculty: Salary is requested for 0.75 months during the summer per year of support for the lead PI Karen McGlathery and for PIs Larry Band and Venkat Lakshmi, and 1.8 months year-1 for PI Gizem Korkmaz. McGlathery is the lead PI and primary contact with NSF, and will interface VCR LTER data and community engagement with VCR LTER program; Band will work on the environmental data curation, mapping and modeling; Lakshmi will lead the remote sensing land use analysis; Korkmaz will oversee the social network analysis, will work Goldstein and Shafiee-Jood on the synthetic information and agent-based modeling, and will work with Claibourn and others on creating the open-science platform. Summer salary (1 month) is also requested in all years for PI Barbara Brown Wilson and for Senior Personnel Teresa Culver and Patricia Wiberg (1 month). Wilson will work with Claibourne to create the Social Equity Atlas and its interface with the Climate Equity Atlas; Culver will lead the groundwater modeling; and Wiberg will lead the storm surge modeling. A 2% annual increment is included in the out years of the project. Fringe benefits during summer months as approved by DHHS are 6.3% for academic faculty with 9-month appointments and 28.3% for 12-month appointments.

Research Faculty: For faculty with full-time research appointments, salary is requested for Senior Personnel Michelle Claibourn (1 month $year^{-1}$), Majid Shafiee-Jood (3 months $year^{-1}$) and Josh Goldstein (4 month $year^{-1}$). Claibourn will work with Wilson to create the Social Equity Atlas and its interface with the Climate Equity Atlas; Shafiee-Jood will lead the participatory agent-based socio-environmental modeling; Goldstein will lead the synthetic information modeling and will support integration of the social network analysis to agent-based modeling. A 2% annual increment is included in the out years of the project. Fringe benefits as approved by DHHS are 28.3%% for research faculty (Shafiee-Jood) and 38.1% for Professional Staff (Claibourn). Funds are also requested for the Director of the Institute for Engagement & Negotiation (IEN) at UVA, Tanya Denckla Cobb at 1 month per year. Listed as Sr. Personnel with a total rate of $18,581 in each year of the project, IEN has a University/Board-approved service center rate for their employees' efforts. Based on current salary and fringe rates, but applied as a total cost per the service center agreement.

Other Personnel: Funding is requested for 6 months of support for the Project Manager of the Institute for Engagement & Negotiation's RAFT Project Manager, Sierra Gladfelter. She will be responsible for coordinating all participatory workshops with stakeholders, and will be the primary liaison between the Hub team and community leaders. A 2% annual increase is included for all staff positions in the out years. Fringe benefits for Gladfelter are calculated at 38.1%.

Postdoctoral Fellow: Support for 6 months of support for a post-doctoral fellow at the Biocomplexity Institute and Initiative is requested in each year. Kramer will initially fill this position and will assist with data discovery, data collection, network analysis, and the dissemination activities (publications, data release etc.). Salary is escalated by 2% for both postdoctoral in following years.

Graduate Students: Funding is requested for UVA graduate students during the academic year and summer months. Two graduate students will be recruited through the Department of Environmental

Sciences to work on storm-surge modeling, land-cover change, and watershed modeling, one through the School of Architecture to work on the Equity and Climate Equity Atlas', and one through the School of Engineering and Applied Sciences to work on groundwater modeling. Additionally, the Institute for Engagement and Negotiation will employ a graduate research assistant at part time to assist IEN efforts. No tuition or insurance is applicable to this student.

Travel: Funds are requested for the PIs, Senior Investigators, Students and Staff to travel to the study location on the Eastern Shore of Virginia (ESVA), a 3.5 hour drive from the University of Virginia. The funds requested for travel each year include per-trip reimbursement to meet stakeholders and community leaders, participate in community workshops, and contribute to education and outreach programs; when needed, accommodation at the University of Virginia's Coastal Research Center ($15 per night) is available. Funds are requested for an annual "All Hands" meeting of Coastal Futures Hub researchers, stakeholders, and educators; likely to occur in January. Funds are also include for travel for the PI 2x per year to NSF for CoPe Hub meetings. Finally, we request for travel of PIs and students to annual conferences to present research results. Domestic travel is budgeted as $20,000 in Years 1-3, $15,000 in year 4, and $10,000 in Year 5.

Participant Support Stipends: Each year, funds are requested for stipends for two Research Experience for Undergraduates (REU) participants ($5,000 each), and for 2 Research Experience for High School Students (REHSS) participants ($2,000 each). Additional $15,000 funding is requested for half-time support of one project team (1 graduate (M.S. or Ph.D) and 2 undergraduate students) to participate in the CoPe team for 11-weeks during the summer as part of the Data Science for the Public Good Young Scholars Program.

Participant Support Costs: Funds are requested each year for other participant support costs associated with the Coastal Hub community workshops, working groups, and decision-support experiment (done as participatory game). These are: $2,000 for food and non-alcoholic drinks for the community members and researchers participating in the workshops; $6,000 to incentivize community members (e.g. $50 gift cards) to participate in the workshop, and $7,000 to participate in the decision experiment. This rate is based on our previous experience through the RAFT workshops and other decision experiments.

Other Direct Costs:

Decision-Experiment Application: Funds ($8,000) are requested in Year 2 for the development of a web-based application with specialized software to run the decision experiment with stakeholders. Capital expenses over $5,000 are excluded from IDC.

Community Leaders: Community leaders are critical to the success of the CoPe Hub, and support for community leaders is requested in all years to engage with all Coastal Futures Hub activities and act as a liaison with the local communities. We will initially hire one leader (Year 1), and this leader will help develop a team (YR 2-5) who will help carry the project forward. The lead community liaison will receive an honorarium of $10,000 per year for their leadership to help build and sustain the network of community liaisons, and this network of (likely 5 based on community capacity and need) leaders will each receive honoraria of $2,000 per year.

Project Evaluator: We have a developed a project evaluation plan for the Coastal Futures Hub with an outside evaluator in Charlottesville, VA, Partners for Sustained Impact. This entity will do an annual evaluation of the Coastal Futures Hub to track progress of research products, equity and

representativeness, academic outputs, community capacity gains, and overall health of the collaboration. Estimated costs for the evaluation are $10,000 - $15,000 per year. We have budgeted accordingly: $10,000 in years 1-2 and $15,000 in years 3-5.

Materials and Supplies: We request fund for materials and supplies to support the community engagement workshops, including printed materials, markers, maps, and flip charts, estimated to amount to $400 per year.

Publication Fees: Our PIs are publishing in on-line and print journals, which now typically charge fees. We request support for publication fees of: $5,000 in Years 3 and 4.

Subcontracts: Two subcontracts are requested with this grant, both subcontractors are institutional partners in the Resilience Adaptation Feasibility Tool (RAFT) program that is being leveraged by this CoPe Hub and have worked together for years on community engagement. The subcontracts to the College of William and Mary's Virginia Coastal Policy Center ($17,500 per year) and Old Dominion University's School of Public Service ($15,000 per year) will cover the costs of participation by Senior Investigators Elizabeth Andrews (W&M) and Wie Yusuf (ODU) in leading the community engagement that is critical to the success of the Hub.

Tuition: Tuition costs track the funding source for graduate students. Accordingly, we have requested full-time tuition support for four graduate students each year. For the three graduate students in the College of Arts and Sciences, tuition is budgeted at $9,112 in Year 1, with a 4% rate increase factored in for the out years. For the graduate student in the School of Engineering and Applied Sciences, tuition is budgeted at $19,188, with a 3.5% rate increase factored in for the out years (years 4 and 5 are research only credit hours). Estimated escalations are based on historical rate increases for each school.

Health Insurance: The University of Virginia requires that graduate students be provided with health insurance. Insurance costs are charged to the funding sources that cover a student's salary. Accordingly, we request funding for four full-time students based on the current annual rate of $2,980. A 4% rate increase is factored in for the out years for A&S students and 5% for the Engineering student.

*G.6 Other – In the Fastlane budget pages, G.6 consists of tuition and insurance totaled each year.

	Tuition	Insurance	Total
Yr1	$46,544	$11,920	$58,474
Yr2	$48,320	$12,427	$60,747
Yr3	$50,154	$12,955	$63,109
Yr4	$43,412	$13,506	$56,918
Yr5	$45,085	$14,081	$59,166

INDIRECT COSTS: The Indirect Cost (F&A) rate currently in place for the University of Virginia, as approved by DHHS, is 61.5% for on-campus organized research. In this proposal, the F&A rate is MTDC and applied to direct costs, less tuition, equipment and specialized software>$5,000, participant support and subcontracts amounts in excess of $25,000.

Current and Pending Support

Investigator: Elizabeth Andrews	August 2020

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

Source of Support: NSF CoPe Program

Total Award Amount: $87,500 Total Award Period Covered: May 2021 – April 2026

Location of Project: Virginia

Person-Months Per Year Committed to the Cal: 0.25 Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Refining The RAFT for Broader Implementation

Source of Support: NOAA (through the Virginia Coastal Zone Management Program)

Total Award Amount: $40,000 Total Award Period Covered: Oct 2019 to Sept 2020

Location of Project: Coastal Virginia

Person-Months Per Year Committed to the Cal: 0.65 Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: NOAA Sea Grant Omnibus – Virginia Sea Grant – Fostering a More Resilient Commonwealth

Source of Support: NOAA

Total Award Amount: $100,000 Total Award Period Covered: Feb 2020 to Jan 2022

Location of Project: Virginia

Person-Months Per Year Committed to the Cal: 1.0 Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Increasing use of natural and nature-based features to build resilience in storm-driven flooding

Source of Support: NOAA

Total Award Amount: $157,625 Total Award Period Covered: Oct 2017 to Sept 2020

Location of Project: Virginia

Person-Months Per Year Committed to the Cal: 1.5 Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ ☐ *Transfer

Project/Proposal Title: VA Tribal Policies

Source of Support: NOAA (through Virginia Coastal Zone Management Program)

Total Award Amount: $30,000 Total Award Period Covered: Oct 2018 to Dec 2020

Location of Project: Virginia

Person-Months Per Year Committed to the Cal: 0.25 Acad: Sumr:

Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: The RAFT: Building Climate Resilience in Virginia's Northern Neck through Community Driven Planning and Action				
Source of Support: DuPont Fund				
Total Award Amount: $35,000	Total Award Period Covered: Oct 2019 to Dec 2020			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 1.5	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Supporting Informed Decision-Making				
Source of Support: Virginia Environmental Endowment				
Total Award Amount: $20,000	Total Award Period Covered: May 2020 to April 2021			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 0.25	Acad:	Sumr:
Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: Supporting Informed Decision-Making (Part II)				
Source of Support: Virginia Environmental Endowment				
Total Award Amount: $10,000	Total Award Period Covered: Nov 2020 to Oct 2021			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 0.1	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Implementing The RAFT to Increase Resilience in Virginia's Northern Neck				
Source of Support: Virginia Environmental Endowment				
Total Award Amount: $20,000	Total Award Period Covered: Oct 2019 to June 2021			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 0.25	Acad:	Sumr:
Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: The Resilience Adaptation Feasibility Tool (RAFT)				
Source of Support: NOAA (through Virginia Coastal Zone Management Program)				
Total Award Amount: $50,000	Total Award Period Covered: Oct 2020 to Sept 2021			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 1.5	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Commonwealth Center for Recurrent Flooding Resiliency				
Source of Support: Virginia General Assembly Appropriation (through Virginia Institute of Marine				
Total Award Amount: $270,000	Total Award Period Covered: July 2020 to June 2022			
Location of Project: Virginia				
Person-Months Per Year Committed to the		Cal: 1	Acad:	Sumr:

Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Building Capacity for Climate Resilience in Albemarle-Pamlico Region Tribal Communities Source of Support: EPA Supplemental Funding through APNEP Total Award Amount: $2,500 Total Award Period Covered: March 2020 to Sept 2020 Location of Project: Virginia and North Carolina Person-Months Per Year Committed to the		Cal: 0.1	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Developing a Strategy for Understanding & Addressing Sea Level Rise, Land Subsidence & Recurrent Flooding Impacts on Road Infrastructure Source of Support: Virginia Transportation Research Council (through Virginia Institute of Marine Total Award Amount: $30,000 Total Award Period Covered: July 2019 to June 2024 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 0.3	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: New Guidance to Build Resiliency and Mitigate for Sea Level Rise as Elements of the Chesapeake Bay Preservation Act Source of Support: NOAA (through Virginia Coastal Zone Management Program) Total Award Amount: $50,878 Total Award Period Covered: Oct 2020 to March 2022 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 1.55	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: MD DNR Adaptation Plan Source of Support: Maryland Dept. of Natural Resources Total Award Amount: $5,000 Total Award Period Covered: May 2020 to Oct 2020 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 0.2	Acad:	Sumr:
Support:	☒ Current	☐ Pending	☐	☐ *Transfer
Project/Proposal Title: Mid-Atlantic Resilience Community of Practice Scoping Workshop Source of Support: NOAA Total Award Amount: $10,000 Total Award Period Covered: Feb 2020 to Jan 2021 Location of Project: Mid-Atlantic Region Person-Months Per Year Committed to the		Cal: 0.25	Acad:	Sumr:
Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: Integrating SMART Hospitals with the Resilience Adaptation Feasibility Tool (RAFT) to Advance Climate Resilience in Cities: Application in Virginia Source of Support: Robert Wood Johnson Foundation Total Award Amount: $150,000 Total Award Period Covered: Nov 2020 to March 2022 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 1.5	Acad:	Sumr:

Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: CZM RESILIENCY FOCAL AREA PROPOSAL, Conservation Planning Source of Support: NOAA (through Virginia Coastal Zone Management Program) Total Award Amount: $20,000 Total Award Period Covered: July 2019 to June 2024 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 0.2	Acad:	Sumr:
Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: Wind Energy Siting Grant Source of Support: Department of Defense (through ODU) Total Award Amount: $60,000 Total Award Period Covered: July 2020 to Dec 2021 Location of Project: Virginia Person-Months Per Year Committed to the		Cal: 1	Acad:	Sumr:
Support:	☐ Current	☒ Pending	☐	☐ *Transfer
Project/Proposal Title: Focused CoPe: Strengthening Coasts and People (SCOPE): Multi-dimensional exploration of the capacity for resilience in coastal communities Source of Support: NSF CoPe Program Total Award Period Covered: April 2021 – March 2026 Total Award Amount: $833,142 Location of Project: Virginia and North Person-Months Per Year Committed to the		Cal: 1.5	Acad:	Sumr:

*PI/co-PI/Senior Personnel Name: Band, Lawrence

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : LTER: Baltimore Ecosystem Study: Synthesis of long-term studies of how multiple human and biophysical factors interact to drive ecological change of an urban ecosystem

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): DEB-1855277

*Source of Support: NSF

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 12/2018

Project/Proposal End Date (MM/YYYY) (if available) : 11/2021

*Total Award Amount (including Indirect Costs): $ 63,755

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2018	0.25
2. 2019	0.25
3. 2020	0.25

Year (YYYY)	Person Months (##.##)
4.	
5.	

2. *Project/Proposal Title : CNH-L: Multi scale coupled natural-human system dynamics of nitrogen

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): ICER-1615560

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 07/2017

Project/Proposal End Date (MM/YYYY) (if available) : 06/2021

*Total Award Amount (including Indirect Costs): $ 207,208

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2017	1.00
2. 2018	1.00
3. 2019	1.00

Year (YYYY)	Person Months (##.##)
4. 2020	0.50
5.	

Projects/Proposals

3. *Project/Proposal Title : LTER: Baltimore Ecosystem Study (BES): Multi-scale Dynamics of a Redeveloping, Post-Industrial Ecosystem in Response to Long-Term Socio-Environmental Change

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia/Baltimore

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2024

*Total Award Amount (including Indirect Costs): $ 164,296

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.25	4. 2024	0.00
2. 2022	0.00	5.	
3. 2023	0.00		

4. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.75	4. 2024	0.75
2. 2022	0.75	5. 2025	0.75
3. 2023	0.75		

NSF CURRENT AND PENDING SUPPORT **OMB-3145-0058**

*PI/co-PI/Senior Personnel Name: Barbara Brown Wilson

NSF ID: 000554763

***Required fields**

Note: NSF has provided 10 Project/Proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Engaged Information and Response System for Transit and Regional Accessibility (EIRS-TRA)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF Civic Innovation Challenge Planning Grant

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2020

Project/Proposal End Date (MM/YYYY) (if available) : 01/2021

*Total Award Amount (including Indirect Costs): $ 49,999

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1. 2020	0.10	4.	
2.		5.	
3.			

2. *Project/Proposal Title : Design + Manufacture + Build

*Status of Support : ◉ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 18300564218

*Source of Support: National Endowment for the Arts

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 02/2018

Project/Proposal End Date (MM/YYYY) (if available) : 12/2020

*Total Award Amount (including Indirect Costs): $ 40,000

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1. 2019	2.00	4.	
2.		5.	
3.			

Projects/Proposals

3. *Project/Proposal Title : Co-Creating the Charlottesville-Area Equity Atlas

*Status of Support : (●) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): 9418027818

*Source of Support: Inter Museum and Library Services

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 08/2018

Project/Proposal End Date (MM/YYYY) (if available) : 12/2020

*Total Award Amount (including Indirect Costs): $ 148,661

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1. 2019	2.00	4.	
2. 2020	2.00	5.	
3.			

4. *Project/Proposal Title : The Charlottesville Regional Equity Atlas: Co-Creating with our Community

*Status of Support : ( ) Current (●) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Public Interest Technology University Network Challenge

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2021

*Total Award Amount (including Indirect Costs): $ 87,500

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1. 2021	0.50	4.	
2.		5.	
3.			

Projects/Proposals

5. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1. 2021	1.00	4. 2024	1.00
2. 2022	1.00	5. 2025	1.00
3. 2023	1.00		

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Calendar Year Committed to the Project

*Calendar Year (YYYY)	*Person Months (##.##)	Calendar Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Michele Claibourn

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Building a Collaborative Regional Equity Atlas

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Institute of Museum and Library Services

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2018

Project/Proposal End Date (MM/YYYY) (if available) : 10/2020

*Total Award Amount (including Indirect Costs): $ 148,661

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2018	0.30
2. 2019	1.20
3. 2020	1.00

Year (YYYY)	Person Months (##.##)
4.	
5.	

2. *Project/Proposal Title : The Charlottesville Regional Equity Atlas: Co-Creating with our Community

*Status of Support : ( ) Current (•) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Public Interest Technology University Network Challenge

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2021

*Total Award Amount (including Indirect Costs): $ 87,500

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2020	1.20
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

3. *Project/Proposal Title : SCC-CIVIC-PGTrack A: Engaged Information and Response System for Transit and Regional Accessibility (EIRS-TRA_

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2020

Project/Proposal End Date (MM/YYYY) (if available) : 01/2021

*Total Award Amount (including Indirect Costs): $ 50,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.30	4.	
2. 2021	0.10	5.	
3.			

4. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : UVA

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.00	4. 2024	1.00
2. 2022	1.00	5. 2025	1.00
3. 2023	1.00		

*PI/co-PI/Senior Personnel Name: Teresa B. Culver

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Overcoming Social and Technical Barriers for the Broad Adoption of Smart Stormwater Systems

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): 1737432

*Source of Support: NSF SCC program subaward through the University of Michigan

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2017

Project/Proposal End Date (MM/YYYY) (if available) : 08/2021

*Total Award Amount (including Indirect Costs): $ 272,998

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2017	0.00
2. 2018	0.50
3. 2019	0.50

Year (YYYY)	Person Months (##.##)
4. 2020	0.50
5. 2021	0.00

2. *Project/Proposal Title : Rebuilding America's Infrastructure

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Department of Education - GAANN

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2018

Project/Proposal End Date (MM/YYYY) (if available) : 08/2021

*Total Award Amount (including Indirect Costs): $ 348,840

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2018	0.00
2. 2019	0.00
3. 2020	0.00

Year (YYYY)	Person Months (##.##)
4. 2021	0.00
5.	

Projects/Proposals

3. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.00	4. 2024	1.00
2. 2022	1.00	5. 2025	1.00
3. 2023	1.00		

4. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Tanya Denckla Cobb

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Indian Communication and Tribal Consultation Training

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Argonne (master contract for USAF)

*Primary Place of Performance : Online during COVID

Project/Proposal Start Date (MM/YYYY) (if available) : December 2019

Project/Proposal End Date (MM/YYYY) (if available) : December 2020

*Total Award Amount (including Indirect Costs): $ 118,029

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	1.425	4.	
2.		5.	
3.			

2. *Project/Proposal Title : Oceans PACT/ Belmont Forum

*Status of Support : ◉ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : August 2020

Project/Proposal End Date (MM/YYYY) (if available) : August 2023

*Total Award Amount (including Indirect Costs): $ 394,304

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.35	4. 2023	30
2. 2021	0.72	5.	
3. 2022	0.72		

Projects/Proposals

3. *Project/Proposal Title : RRRPDC - Lower Chickahominy

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): GS11630

*Source of Support: Virginia DEQ/ NOAA

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 11/2019

Project/Proposal End Date (MM/YYYY) (if available) : 9/2020

*Total Award Amount (including Indirect Costs): $ 99,722

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2019	.2
2. 2020	.52
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

4. *Project/Proposal Title : William & Mary

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): GO12713

*Source of Support: Virginia DEQ/NOAA

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2019

Project/Proposal End Date (MM/YYYY) (if available) : 9/2020

*Total Award Amount (including Indirect Costs): $ 10,500

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2019	.04
2. 2020	.30
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

5. *Project/Proposal Title : The RAFT: Building Resilience in Virginia's Northern Neck

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): GF14143

*Source of Support: Jesse Ball duPont

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 07/2019

Project/Proposal End Date (MM/YYYY) (if available) : 12/2020

*Total Award Amount (including Indirect Costs): $ 102,034

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2019	.4	4.	
2. 2020	.43	5.	
3.			

6. *Project/Proposal Title : Supporting The RAFT

*Status of Support : ( ) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: DEQ Coastal Zone Management Program / NOAA

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2020

Project/Proposal End Date (MM/YYYY) (if available) : 09/2021

*Total Award Amount (including Indirect Costs): $ 18,500

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	.1	4.	
2. 2021	.62	5.	
3.			

Projects/Proposals

7. *Project/Proposal Title : Integrating SMART Hospitals with the Resilience Adaptation Feasibility Tool (RAFT) to Advance Climate Resilience in Cities: Application in Virginia

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Robert Wood Johnson Foundation

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 11/2020

Project/Proposal End Date (MM/YYYY) (if available) : 4/2023

*Total Award Amount (including Indirect Costs): $ 599,996

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	.2	4. 2023	.6
2. 2021	1.15	5.	
3. 2022	1.35		

8. *Project/Proposal Title : The RAFT

*Status of Support : ◉ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): GF14204

*Source of Support: Virginia Environmental Endowment

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 3/2020

Project/Proposal End Date (MM/YYYY) (if available) : 6/2021

*Total Award Amount (including Indirect Costs): $ 20,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	.1	4.	
2. 2021	.1	5.	
3.			

Projects/Proposals

9. *Project/Proposal Title : MD-DNR Adaptation Framework 2030: Resilience Strategies for the Next Decade

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): 164890

*Source of Support: Maryland Dept Natural Resources

*Primary Place of Performance : Maryland

Project/Proposal Start Date (MM/YYYY) (if available) : 5/2020

Project/Proposal End Date (MM/YYYY) (if available) : 11/2020

*Total Award Amount (including Indirect Costs): $ 90,008

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	.28	4.	
2.		5.	
3.			

10. *Project/Proposal Title : Advancing Environmental Justice and Equity in Virginia's Natural Resources

*Status of Support : ( ) Current (•) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Virginia Environmental Endowment

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2020

Project/Proposal End Date (MM/YYYY) (if available) : 9/2020

*Total Award Amount (including Indirect Costs): $ 25,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0	4.	
2. 2020	0	5.	
3.			

Projects/Proposals

11. *Project/Proposal Title : Virginia Natural Resources Leadership Institute

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 411010

*Source of Support: Virginia Department of Forestry

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 9/2020

Project/Proposal End Date (MM/YYYY) (if available) : 6/2021

*Total Award Amount (including Indirect Costs): $ 10,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0	4.	
2. 2021	0	5.	
3.			

12. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 5/2021

Project/Proposal End Date (MM/YYYY) (if available) : 4/2026

*Total Award Amount (including Indirect Costs): $ 4856493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.0	4. 2024	1.0
2. 2022	1.0	5. 2025	1.0
3. 2023	1.0		

NSF CURRENT AND PENDING SUPPORT

PI/co-PI/Senior Personnel: Goldstein, Josh

PROJECT/PROPOSAL CURRENT SUPPORT

1. Project/Proposal Title: Developing Predictive Models of U.S. Army Career Pathways through the Integration of Multiple Army Administrative and Other Data Sources

   Proposal/Award Number (if available): W911NF2020027

   Source of Support: Army Research Institute

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/10

   Project/Proposal Support End Date (if available): 2024/09

   Total Award Amount (including Indirect Costs): $3,173,426

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	3
2021	3
2022	3
2023	3
2024	3

2. Project/Proposal Title: Towards A National Community Learning Network

   Proposal/Award Number (if available): INV-003671

   Source of Support: Bill & Melinda Gates Foundation

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/10

   Project/Proposal Support End Date (if available): 2020/09

   Total Award Amount (including Indirect Costs): $471,170

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	1.8
2020	0.24

3. Project/Proposal Title: ARI1 -Towards an Integrated Data Framework for Understanding the Context of Military Environments

   Proposal/Award Number (if available): W911NF1920176

   Source of Support: U.S. DOD - Army Research Institute

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/06

   Project/Proposal Support End Date (if available): 2021/06

   Total Award Amount (including Indirect Costs): $286,826

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	3.6

4. Project/Proposal Title: Maximizing the Use of Existing Data for Policy and Planning by Creating Indices for Predictive and Prescriptive Analytics

   Proposal/Award Number (if available): 8500395371

   Source of Support: County of Fairfax

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/04

   Project/Proposal Support End Date (if available): 2020/09

   Total Award Amount (including Indirect Costs): $125,000

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	0.48

5. Project/Proposal Title: Maximizing the Use of Existing Data for Policy and Planning by Creating Indices for Predictive and Prescriptive Analytics Yr 2

   Proposal/Award Number (if available): 8500395371

Source of Support: County of Fairfax, Virginia

Primary Place of Performance: University of Virginia

Project/Proposal Support Start Date (if available): 2019/04

Project/Proposal Support End Date (if available): 2020/09

Total Award Amount (including Indirect Costs): $100,000

Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	1.5
2020	0.76

6. Project/Proposal Title: ARI2 - The social component of the human dimension: Leveraging existing DoD data towards optimized Individual and team performance in the Army

   Proposal/Award Number (if available): W911NF1920164

   Source of Support: U.S. DOD - Army Research Institute

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/02

   Project/Proposal Support End Date (if available): 2023/06

   Total Award Amount (including Indirect Costs): $293,103

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	2.4
2021	4.2
2022	4.2
2023	4.2

7. Project/Proposal Title: Impacts of Broadband Development on Rural Property Values

   Proposal/Award Number (if available): 58-6000-8-0039

   Source of Support: U.S. Department Of Agriculture (USDA)

   Primary Place of Performance: University of Virginia

Project/Proposal Support Start Date (if available): 2018/08

Project/Proposal Support End Date (if available): 2021/09

Total Award Amount (including Indirect Costs): $400,000

Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	3
2020	3

PROJECT/PROPOSAL PENDING SUPPORT

1. Project/Proposal Title: Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

   Proposal/Award Number (if available):

   Source of Support: NSF

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2021/05

   Project/Proposal Support End Date (if available): 2026/04

   Total Award Amount (including Indirect Costs): $4,856,493

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2021	4
2022	4
2023	4
2024	4
2025	4

2. Project/Proposal Title: DTRA TECHNICAL REACHBACK SURGE SUPPORT - HDTRA120F0017

   Proposal/Award Number (if available): 409701

   Source of Support: Applied Research Associates, Inc.

Primary Place of Performance: University of Virginia

Project/Proposal Support Start Date (if available): 2020/07

Project/Proposal Support End Date (if available): 2024/12

Total Award Amount (including Indirect Costs): $15,327,505

Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	0.75
2021	0.75
2022	0.75
2023	0.75
2024	0.3

NSF CURRENT AND PENDING SUPPORT

PI/co-PI/Senior Personnel: Korkmaz, Gizem

PROJECT/PROPOSAL CURRENT SUPPORT

1. Project/Proposal Title: Proposal in Response to Solicitation #49100420R0012

   Proposal/Award Number (if available): 49100420C0015

   Source of Support: U.S. National Science Foundation (NSF)

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2020/06

   Project/Proposal Support End Date (if available): 2022/05

   Total Award Amount (including Indirect Costs): $1,500,000

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	4.93
2021	4.57

2. Project/Proposal Title: MINERVA The Dynamcs of Common Knowledge on Social Networks: An Experimental Approach

   Proposal/Award Number (if available): 450538-20006

   Source of Support: Virginia Polytechnic Institute and State University

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/11

   Project/Proposal Support End Date (if available): 2021/09

   Total Award Amount (including Indirect Costs): $1,205,198

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	5
2020	1.25

3. Project/Proposal Title: Towards A National Community Learning Network

   Proposal/Award Number (if available): INV-003671

   Source of Support: Bill & Melinda Gates Foundation

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/11

   Project/Proposal Support End Date (if available): 2020/12

   Total Award Amount (including Indirect Costs): $1,001,326

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	0.6

4. Project/Proposal Title: The American Soldier in World War II

   Proposal/Award Number (if available): 545294-20006

   Source of Support: Virginia Polytechnic Institute and State University

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/08

   Project/Proposal Support End Date (if available): 2021/03

   Total Award Amount (including Indirect Costs): $60,971

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	0.12
2020	0.12

5. Project/Proposal Title: Cognitio Veritas: Scaling the Cognitive Foundations of Online Social Behavior

   Proposal/Award Number (if available): FA8650-19-C-7923

   Source of Support: U.S. DOD - DARPA

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/06

   Project/Proposal Support End Date (if available): 2021/10

Total Award Amount (including Indirect Costs): $1,679,496

Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	2.16
2020	2.16
2021	0.54

6. Project/Proposal Title: FACT: Three-State Data Science for the Public Good Coordinated Innovation Network

   Proposal/Award Number (if available): 2019-68017-29934

   Source of Support: U.S. Department Of Agriculture (USDA)

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2019/04

   Project/Proposal Support End Date (if available): 2021/03

   Total Award Amount (including Indirect Costs): $999,973

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	0.62
2020	0.62

7. Project/Proposal Title: Use of Statistical and Survey Methodology Research to Improve or Redesign Surveys

   Proposal/Award Number (if available): 58-3AEU-9-0021

   Source of Support: U.S. Department Of Agriculture (USDA)

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2018/12

   Project/Proposal Support End Date (if available): 2023/11

   Total Award Amount (including Indirect Costs): $1,029,315

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2019	2.51
2020	5.4

PROJECT/PROPOSAL PENDING SUPPORT

1. Project/Proposal Title: Bridging the Divide: Understanding the Nature of Polarization and Divisive Discourse in the United States

   Proposal/Award Number (if available): 410902

   Source of Support: John Templeton Foundation

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2021/07

   Project/Proposal Support End Date (if available): 2024/03

   Total Award Amount (including Indirect Costs): $1,353,982

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2021	0.6
2022	0.6
2023	0.6

2. Project/Proposal Title: Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (This Proposal)

   Proposal/Award Number (if available):

   Source of Support: NSF

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2021/05

   Project/Proposal Support End Date (if available): 2026/04

   Total Award Amount (including Indirect Costs): $4,856,493

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed

2021	1.8
2022	1.8
2023	1.8
2024	1.8
2025	1.8

3. Project/Proposal Title: Partnership for a New Tomorrow - Creating a Data Science Public Interest Technology Workforce Pipeline

   Proposal/Award Number (if available): 410527

   Source of Support: New Venture Fund

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2020/10

   Project/Proposal Support End Date (if available): 2021/09

   Total Award Amount (including Indirect Costs): $74,999

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2020	0.12

4. Project/Proposal Title: U.S. Census Bureau Research and Methodology Directorate Cooperative Agreements - Address-and Probability-Based Online Panel Recruitment and Maintenance

   Proposal/Award Number (if available): 410653

   Source of Support: Westat, Inc.

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2020/09

   Project/Proposal Support End Date (if available): 2025/08

   Total Award Amount (including Indirect Costs): $845,000

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	Person-months per year committed
2021	1.2

2022	2.4
2023	2.4

5. Project/Proposal Title: EAGER: Improving the Quality and Reducing the Burden of Producing and Reusing Publicly Accessible Research Data

   Proposal/Award Number (if available): 410492

   Source of Support: Iowa State University

   Primary Place of Performance: University of Virginia

   Project/Proposal Support Start Date (if available): 2020/08

   Project/Proposal Support End Date (if available): 2022/01

   Total Award Amount (including Indirect Costs): $135,000

   Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project:

Year	**Person-months per year committed**
2020	1.2
2021	1.2
2022	0.6

*PI/co-PI/Senior Personnel Name: Lakshmi, Venkataraman

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Improved Hydrologic Decision Support for the Lower Mekong River Basin Through Integrated Remote Sensing and Modeling

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NASA SERVIR

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 10/2016

Project/Proposal End Date (MM/YYYY) (if available) : 07/2020

*Total Award Amount (including Indirect Costs): $ 52,305

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2017	0.50
2. 2018	0.50
3. 2019	0.50

Year (YYYY)	Person Months (##.##)
4. 2020	0.50
5.	

2. *Project/Proposal Title : Evaluation of Risk and Capacity Development for Two Indian River Basins

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NASA GEO

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2019

Project/Proposal End Date (MM/YYYY) (if available) : 01/2021

*Total Award Amount (including Indirect Costs): $ 148,553

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2019	1.00
2. 2020	1.00
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

3. *Project/Proposal Title : Downscaling SMAP radiometer soil moisture for CONUS using vegetation and surface temperature

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NASA Goddard

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 06/2019

Project/Proposal End Date (MM/YYYY) (if available) : 06/2021

*Total Award Amount (including Indirect Costs): $ 108,567

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.50	4.	
2. 2021	0.50	5.	
3.			

4. *Project/Proposal Title : Improved Assessments of Permafrost and seasonally frozen ground in High Mountain Asia by Integrating Satellite Observations with Physics-Based Models and In-Situ

*Status of Support : ( ) Current (•) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: JHU/NASA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 08/2019

Project/Proposal End Date (MM/YYYY) (if available) : 07/2022

*Total Award Amount (including Indirect Costs): $ 406,286

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	1.00	4.	
2. 2021	1.00	5.	
3. 2022	1.00		

Projects/Proposals

5. *Project/Proposal Title : Development of a Long-Term Consistent Multi-Satelite Soil Moisture Data Record with Uncertainty Information

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NASA/JPL

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2020

Project/Proposal End Date (MM/YYYY) (if available) : 12/2022

*Total Award Amount (including Indirect Costs): $ 270,508

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2020	0.50
2. 2021	0.50
3. 2022	0.50

Year (YYYY)	Person Months (##.##)
4.	
5.	

6. *Project/Proposal Title : Optimization of Egypt's Water Usage and Agriculture Productivity Using Modeling and Satellite Observations

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Chapman University

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 06/2020

Project/Proposal End Date (MM/YYYY) (if available) : 05/2022

*Total Award Amount (including Indirect Costs): $ 50,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2021	0.44
2. 2022	0.44
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

7. *Project/Proposal Title : Mapping flood impacts using multi-sensor satellite data fusion in urban areas

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Columbia University/NASA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2020

Project/Proposal End Date (MM/YYYY) (if available) : 12/2020

*Total Award Amount (including Indirect Costs): $ 105,203

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.80	4.	
2.		5.	
3.			

8. *Project/Proposal Title : High-Resolution Estimation of Groundwater Withdrawals using Machine Learning Integration of Satellite Datasets

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: UMS/NASA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2020

Project/Proposal End Date (MM/YYYY) (if available) : 12/2022

*Total Award Amount (including Indirect Costs): $ 180,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.50	4.	
2. 2021	0.50	5.	
3. 2022	0.50		

Projects/Proposals

9. *Project/Proposal Title : Investigation of Land Cover and Land Use Change in the Middle East and North Africa (MENA) Region from Multi-Source Satellite Assessment

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Chapman University/NASA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2023

*Total Award Amount (including Indirect Costs): $ 166,642

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2021	0.50
2. 2022	0.50
3. 2023	0.50

Year (YYYY)	Person Months (##.##)
4.	
5.	

10. *Project/Proposal Title : Urbanization in India in the past decade (2010-2020): A study of several hotspots

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NASA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2023

*Total Award Amount (including Indirect Costs): $ 757,507

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2021	1.00
2. 2022	1.00
3. 2023	1.00

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

11. *Project/Proposal Title : Quantifying groundwater and surface water scarcity in global areas sensitive to United States national security

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NGIA

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 12/2025

*Total Award Amount (including Indirect Costs): $ 1,401,618

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.00	4. 2024	1.00
2. 2022	1.00	5. 2025	1.00
3. 2023	1.00		

12. *Project/Proposal Title : Focused CoPe: Supporting Environmental Justice in Connected Coastal Communities through a Regional Approach to Collaborative Community Science

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: East Carolina University/NSF Funds

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 08/2022

Project/Proposal End Date (MM/YYYY) (if available) : 07/2026

*Total Award Amount (including Indirect Costs): $ 221,317

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	0.50	4. 2026	0.50
2. 2024	0.50	5.	
3. 2025	0.50		

Projects/Proposals

13. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (This Proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : The University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.75	4. 2024	0.75
2. 2022	0.75	5. 2025	0.75
3. 2023	0.75		

14. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Karen J. McGlathery

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : LTER: Climate drivers, dynamics, and consequences of ecosystem state change in coastal barrier systems

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): DEB-1832221

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA and Oyster, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 12/2018

Project/Proposal End Date (MM/YYYY) (if available) : 11/2024

*Total Award Amount (including Indirect Costs): $ 6,761,999

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2019	1.00	4. 2022	1.00
2. 2020	1.00	5. 2023	1.00
3. 2021	1.00		

2. *Project/Proposal Title : LTER: Climate drivers, dynamics, and consequences of ecosystem state change in coastal barrier systems
Education and ROA Supplements

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): DEB-1832221

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA and Oyster, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 06/2020

Project/Proposal End Date (MM/YYYY) (if available) : 05/2021

*Total Award Amount (including Indirect Costs): $ 30,684

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.00	4.	
2. 2021	0.00	5.	
3.			

Projects/Proposals

3. *Project/Proposal Title : Team Science Training for Coastal & Estuarine STEM Graduate Students

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA and Gloucester, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2017

Project/Proposal End Date (MM/YYYY) (if available) : 08/2021

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2017	0.50
2. 2018	0.50
3. 2019	0.50

Year (YYYY)	Person Months (##.##)
4. 2020	0.00
5.	

4. *Project/Proposal Title : Building oyster reefs and enhancing saltmarsh habitat to strengthen coastal resilience on Virginia's Eastern Shore

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Fisheries and Wildlife Federation

*Primary Place of Performance : Charlottesville, VA and Wachapreague, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 07/2020

Project/Proposal End Date (MM/YYYY) (if available) : 06/2022

*Total Award Amount (including Indirect Costs): $ 835,562

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2020	0.00
2. 2021	0.50
3. 2022	0.50

Year (YYYY)	Person Months (##.##)
4.	
5.	

Projects/Proposals

5. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.75	4. 2024	0.75
2. 2022	0.75	5. 2025	0.75
3. 2023	0.75		

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Majid Shafiee-Jood

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : University of Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	3.00	4. 2024	3.00
2. 2022	3.00	5. 2025	3.00
3. 2023	3.00		

2. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Patricia L. Wiberg

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : LTER: Climate drivers, dynamics, and consequences of ecosystem state change in coastal barrier systems

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): DEB-1832221

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA and Oyster, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 12/2018

Project/Proposal End Date (MM/YYYY) (if available) : 11/2024

*Total Award Amount (including Indirect Costs): $ 6,761,999

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2019	0.50
2. 2020	0.00
3. 2021	0.00

Year (YYYY)	Person Months (##.##)
4. 2022	0.00
5. 2023	0.00

2. *Project/Proposal Title : Building oyster reefs and enhancing saltmarsh habitat to strengthen coastal resilience on Virginia's Eastern Shore

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Fisheries and Wildlife Federation

*Primary Place of Performance : Charlottesville, VA and Wachapreague, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 07/2020

Project/Proposal End Date (MM/YYYY) (if available) : 06/2022

*Total Award Amount (including Indirect Costs): $ 835,562

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)
1. 2020	0.50
2. 2021	1.00
3.	

Year (YYYY)	Person Months (##.##)
4. 2022	0.75
5.	

Projects/Proposals

3. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: NSF

*Primary Place of Performance : Charlottesville, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 4,856,493

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.00	4. 2024	1.00
2. 2022	1.00	5. 2025	1.00
3. 2023	1.00		

4. *Project/Proposal Title :

*Status of Support : ◉ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*PI/co-PI/Senior Personnel Name: Juita-Elena (Wie) Yusuf

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source[2], irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[3]

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current, Pending, Submission Planned, and Transfer of Support from top to bottom

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] For example, Federal, State, local, foreign, public or private foundations, non-profits, industrial or other commercial organizations or internal funds allocated toward specific projects.
[3] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Coastal SEES Collaborative Research: Sustainability in Chesapeake Bay Shorescapes: Climate change, management decisions, and ecological functions

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): 1600062

*Source of Support: National Science Foundation

*Primary Place of Performance : Norfolk, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2016

Project/Proposal End Date (MM/YYYY) (if available) : 08/2020

*Total Award Amount (including Indirect Costs): $ 115,901

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	1.00	4.	
2.		5.	
3.			

2. *Project/Proposal Title : Virginia Sea Grant Climate Adaptation and Resilience Program

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): 721545-712684

*Source of Support: Sea Grant

*Primary Place of Performance : Norfolk, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 02/2018

Project/Proposal End Date (MM/YYYY) (if available) : 07/2020

*Total Award Amount (including Indirect Costs): $ 113,228

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	2.00	4.	
2.		5.	
3.			

Projects/Proposals

3. *Project/Proposal Title : The Economic Impact of Recurrent Flooding on Workforce Productivity and Property Damage: Determining Return on Investments for Selective Adaptive Investments

*Status of Support : (•) Current ( ) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available): NA19OAR4310309

*Source of Support: National Oceanic and Atmospheric Administration

*Primary Place of Performance : Portsmouth, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 08/2019

Project/Proposal End Date (MM/YYYY) (if available) : 07/2021

*Total Award Amount (including Indirect Costs): $ 296,040

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	1.00	4.	
2. 2021	1.50	5.	
3.			

4. *Project/Proposal Title : COVID-19 Rapid Response and Aquaculture Supplemental

*Status of Support : ( ) Current (•) Pending ( ) Submission Planned ( ) Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Sea Grant (sub-award through Virginia Sea Grant)

*Primary Place of Performance : Norfolk, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2020

Project/Proposal End Date (MM/YYYY) (if available) : 08/2021

*Total Award Amount (including Indirect Costs): $ 10,629

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.75	4.	
2.		5.	
3.			

Projects/Proposals

5. *Project/Proposal Title : RAPID: Response to Potential Compound Hurricane-COVID-19 Threat: Evacuation and Sheltering Behavior of Vulnerable and Medically Fragile Populations

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2020

Project/Proposal End Date (MM/YYYY) (if available) : 11/2020

*Total Award Amount (including Indirect Costs): $ 130,690

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2020	0.70	4.	
2.		5.	
3.			

6. *Project/Proposal Title : Virginia Sea Grant Climate Adaptation and Resilience Program

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Sea Grant

*Primary Place of Performance : Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 09/2020

Project/Proposal End Date (MM/YYYY) (if available) : 08/2021

*Total Award Amount (including Indirect Costs): $ 226,455

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	3.00	4.	
2. 2022	3.00	5.	
3.			

Projects/Proposals

7. *Project/Proposal Title : Adaptation of the Caribbean-proven Sustained Mitigation, Adaptation and Resilient Technique (SMART) Hospitals model and integration with the Resilience Adaptation Feasibility Tool (RAFT)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Robert Wood Johnson Foundation

*Primary Place of Performance : Portsmouth, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 11/2020

Project/Proposal End Date (MM/YYYY) (if available) : 04/2023

*Total Award Amount (including Indirect Costs): $ 120,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.30	4.	
2. 2022	1.20	5.	
3.			

8. *Project/Proposal Title : SCC-CIVIC-PG Track B: Hyper-Resolution Flood Sensing and Simulation for Transportation Flood Resilience: Hampton Boulevard in Norfolk, Virginia as a Case Study

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation (sub-award to Univ of Virginia)

*Primary Place of Performance : Norfolk, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 01/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2021

*Total Award Amount (including Indirect Costs): $ 23,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2024	0.24	4.	
2.		5.	
3.			

Projects/Proposals

9. *Project/Proposal Title : SCC-CIVIC-PG Track B: Convergence, Inventory, Matching, and Assignment (CIMA) to Optimize Post-event Housing Repair of Displaced Vulnerable Populations

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation

*Primary Place of Performance : Norfolk, VA

Project/Proposal Start Date (MM/YYYY) (if available) : 04/2021

Project/Proposal End Date (MM/YYYY) (if available) : 07/2021

*Total Award Amount (including Indirect Costs): $ 50,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.40	4.	
2.		5.	
3.			

10. *Project/Proposal Title : Focused CoPe: Flood Insurance, Mitigation, and Adaptation - Coastal Communities Response to Natural Hazards and Climate Change

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation (sub-award to Univ of Georgia)

*Primary Place of Performance : Virginia, New York, Florida

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 540,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.75	4.	
2. 2023	0.75	5.	
3. 2025	0.75		

Projects/Proposals

11. *Project/Proposal Title : Focused CoPe: Strengthening Coasts and People (SCOPE): Multi-dimensional exploration of the capacity for resilience in coastal communities

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation

*Primary Place of Performance : Virginia and North Carolina

Project/Proposal Start Date (MM/YYYY) (if available) : 04/2021

Project/Proposal End Date (MM/YYYY) (if available) : 03/2026

*Total Award Amount (including Indirect Costs): $ 4,800,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	1.34	4. 2024	1.13
2. 2022	1.20	5. 2025	1.46
3. 2023	1.13		

12. *Project/Proposal Title : Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities (this proposal)

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: National Science Foundation (sub-award to Univ of Virginia)

*Primary Place of Performance : Eastern Shore, Virginia

Project/Proposal Start Date (MM/YYYY) (if available) : 05/2021

Project/Proposal End Date (MM/YYYY) (if available) : 04/2026

*Total Award Amount (including Indirect Costs): $ 15,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2021	0.84	4. 2024	0.77
2. 2022	0.82	5. 2025	0.75
3. 2023	0.79		

FACILITIES, EQUIPMENT AND OTHER RESOURCES

University of Virginia's Anheuser-Busch Coastal Research Center

Facilities available to the CoPe investigators include the University of Virginia's Anheuser-Busch Coastal Research Center (ABCRC) in Oyster VA, and numerous individual laboratories within the University of Virginia's Department of Environmental Sciences and partner institutions. The ABCRC is located on 42 acres on Oyster Harbor, with a dock and boat access to the coastal ecosystems of the Virginia Coast Reserve. Oyster Harbor is one of the few deep-water harbors on the seaside of Eastern Shore of Virginia. The laboratory building (9369 sq. ft.) provides five small laboratories, three large shared laboratories, a staging area, a freezer room, a meeting room, and office space for the Site Director and Research Staff. The residence building (5767 sq. ft.) has capacity for 30 people in 1-5 bedroom apartments, each with private kitchens. Three permanent meteorological stations are in place; one at the ABCRC, one in Phillips Creek Marsh near Nasawadox, VA, and the other on Hog Island. The ABCRC also hosts a NOAA Climate Reference Network station. Three radar-based tide stations are used to monitor tides on Hog island, at the ABCRC, and in Red Bank, VA. Meteorological and tide data collected at the permanent stations are available on the VCR LTER homepage. Additionally, data from the ABCRC tide station is published on NOAA tide-prediction web pages. There are two computing facilities (one at the ABCRC laboratory, one housed in the Environmental Sciences Building at the University of Virginia. Each facility hosts one or more servers running VMWare and hosting a variety of virtual systems running Linux or Windows. UVA has site licenses for ArcGIS, Matlab and many other analytical software packages. The ABCRC is connected to a high-speed Internet connection.

UVA Department of Environmental Science

The Department of Environmental Science is supported with network technology as part of the UVA data network. In collaboration with Microsoft cloud services, Information Technology Service (ITS) of UVA provides web-based cloud services (Office 365) to affiliated faculty and staff. The services include Microsoft online office software applications, such as Outlook, Word, Excel, PowerPoint, OneNote, SharePoint, and Cloud storage service – OneDrive and Box. Researchers using OneDrive or Box storage can share folders to collaborate their research projects easily. A full suite of GIS, image processing, statistical and numerical analysis packages are maintained and available. Software includes ArcGIS, ENVI, R, QGIS, GRASS, Matlab, etc. The University of Virginia Advanced Research Computing Services provides access to high performance computing resources and technical support (https://arcs.virginia.edu/rivanna#toc-4).

Band's research lab includes advanced workstations, facilities to store, calibrate and prepare field sensors for streamflow, water quality, soil moisture, canopy cover, surveying, and ground penetrating radar (GPR). Additional laboratory resources in the Department of Environmental Science include facilities for cold storage and comprehensive analysis of water, soil and plant physical properties, carbon and nutrient concentrations, and water, nitrogen and carbon isotopic analysis.

Engineering Systems and Environment

Office and Graduate Student Space:
PI Lakshmi have office space in Olsson Hall as provided by the University of Virginia in the Department of Engineering Systems and Environment (ESE). ESE grad students have office space with personal computers in Thornton Hall. Large computing resources are maintained by the Advanced Research Computing Services Office at UVA (https://arcs.virginia.edu/) including the Rivanna high-performance computing system. In addition, the University maintains an extensive number of up-to-date software licenses such as ArcGIS, MATLAB, and SAS. Funded students are provided with computers to organize data, run model simulations, and analyze results. Student computers are automatically uploaded with Microsoft Office and other programs and can be accessed virtually through the UVA Hive. The University of Virginia also maintains several conference rooms for videoconferencing. Some of the planned face-to-face meetings with stakeholders and advisors can be cost-effectively replaced with videoconferencing.

UVA Biocomplexity Institute and Initiative (BII)

The UVA BII headquarters is located at the UVA Research Park (Town Center IV, 994 Research Park Blvd.) in Charlottesville, Virginia, and provides more than 60,000 square feet of state-of-the art office, conference, laboratory, and training space. Centrally located in a research park setting, this facility has office space that can accommodate over 200 faculty, staff, and student personnel. BII also has access to the UVA Foundation 150-person conference center on the first floor of this facility, with capability to livestream audio and video to satellite conference rooms. Laboratory space in this facility includes a magnetoencephalography (MEG) laboratory and a 4,000-square foot experimental laboratory space. The Charlottesville facility houses the Network Systems Science and Advanced Computing Division (NSSACD) and the Mathematical Biocomplexity Division (MBD).

BII has an additional location in the DC Metro area, located in the Rosslyn district of Arlington, Virginia. This facility has 9,000 square feet of office space and offers state-of-the-art video and web conferencing rooms and dedicated access to high-performance computing (HPC) data centers. (See Computational Resources section.) In Rosslyn, BII also has access to the UVA Darden Sands Family Grounds, including a 200-person conference center and space for receptions and networking. This location provides a platform for researchers to interact with counterparts in academia, government, and industry in the Washington, D.C. area. The Rosslyn facility houses the Social Decision and Analytics Division (SDAD).

Collectively, the BII/Research Computing team of molecular biologists, scientists, data analysts, IT specialists, and project managers have vast experience in dealing with a multitude of compute and data intensive life and medical science applications and the associated hardware required to run them.

In addition, Research Computing delivers the following services: Server (dedicated and shared/virtual) hosting

- High Performance Computing Storage and backup Database hosting
- Building and supporting unique information technology systems Application development, maintenance, and deployment

- Data support
- Enabling services to support research collaborations

Scientific Environment: All team members have a desktop and a laptop. All are well versed with collaboration tools such as Zoom, Microsoft Teams, Google Docs, Overleaf, Wiki, Skype, GitHub, SVN repository, etc. and have been using them to work with colleagues at a distance.

Institute for Engagement & Negotiation at University of Virginia

The Institute for Engagement & Negotiation is temporarily without a physical home, as the building at UVA where it was housed is being torn down. IEN staff are all provided with computers equipped with appropriate software needed to conduct their work and engagement with stakeholders virtually. Supplies for in-person engagement are currently stored at the School of Architecture. A new physical home is anticipated to be found within the next 12 months.

Virginia Coastal Policy Center at William and Mary Law School

The Virginia Coastal Policy Center offices are housed in the James A. and Robin L. Hixon Center for Experiential Learning and Leadership at William & Mary Law School. The Law School is located at 613 South Henry Street in the City of Williamsburg, Virginia. VCPC occupies three offices and has access to a student work room and conference room within the Hixon Center. The facility is equipped with high-speed internet. Faculty and staff offices include docking stations and computer monitors for university-issued staff and faculty laptops, the student work room includes multiple desktop computers, and the conference room is equipped with video-conferencing equipment.

ODU Institute for Coastal Adaptation and Resilience

The ODU Institute for Coastal Adaptation and Resilience (ICAR, https://oduadaptationandresilience.org/) is a national center that conducts leading edge research, educates professionals, and advances practice by addressing emerging challenges affecting the resilience of coastal communities. Located in the Hampton Roads region of southeastern coastal Virginia, ICAR benefits from access to several natural and social testbeds for creating knowledge related to sea level rise and climate science, flooding and the build environment, social science and policy, and health dimensions of coastal resilience. The strengths of ICAR lies in its infrastructure that supports interdisciplinary collaborations and engaged research, and multidisciplinary approaches to education and training. ICAR emphasizes engaged research and practice that work across sectors (governments, education, nonprofits, business, and society) and levels of government (local, regional, state, federal) to develop solutions for complex challenges in coastal communities.

The Virginia Sea Grant Climate Adaptation and Resilience Program, hosted at Old Dominion University (PI Dr. Wie Yusuf), is part of a national network of boundary-spanning academic organizations that connect academic research and science with federal, state and local government partners as well as private industry, nonprofits/NGOs, and civil society. Focused on community-engaged research and outreach, the program collaborates across universities and with other sectors to promote sustainable and resilient coastal communities and economies. For the last 8 years the program has organized the Hampton Roads

Sea Level Rise/Flooding Adaptation Forum, a quarterly meeting of the resilience community of practice in the urban coastal region of Virginia that reaches between 80-100 resilience and adaptation professionals.

Data Management Plan

1. Types of Resources. The main resources from the proposed research will be data, climate equity atlas, computational algorithms (in pseudocode format), network analysis, statistical analyses and modeling. The codes will be developed, stored, and shared on a public repository hosted on a platform such as GitHub and will be available to researchers together with datasets stored on a relational database management system.

1.1 Data Sources and Collection. We will use a combination of data sources including surveys and administrative records collected through online sources, community planners, and interviews. The identified data sources will be documented on the public project repository and publicly disseminated to the research community providing information about the availability of information in each data source, the acquisition process, and limitations. Table D.1 summarizes a number of the data sources that will be considered and acquired in the proposed project.

Data Sources	Information	Collection/Access
American Community Survey	Socio-demographic information	Publicly available online
Longitudinal Employer-Household Dynamics	Employment and job flow data	Publicly available online
Multiple Listing Services (MLS)	Housing data, e.g., occupancy, home types	MLS publicly available online
Open Street Maps; Google Maps	Location of local stores and businesses	Publicly available online
Virginia Tech CommonwealthConnect	Access to Wifi	Publicly available
Community stakeholder networks	Stakeholders and interactions, key players	Interviews and surveys
Stakeholders' decision rules	Stakeholders' decision making, response to uncertain information, decision & learning heuristics	Decision experiment with stakeholders
Virginia Geographic Information Network (VGIN), Community planners	Current land use and projections	VGIN - publicly available online, County/town planning agencies
Narrative data, local knowledge from communities	Community narratives, priorities, assessment of predictions	De-identified notes and/or transcripts from workshops
VGIN, SSURGO (Soil Survey Geographic Database), local knowledge, remote sensing	Terrain, soils, salinization, geomorphic change	Publicly available online, Virginia Coastal Reserve, stakeholder workshops
NOAA (National Oceanic and Atmospheric Administration) data	Tide data (40-year record of hourly water level)	Publicly available online
Virginia Coast Reserve Long Term Ecological Research Project	Meteorological data, e.g., wind speed and direction, rainfall, temperature; 10-yr stream discharge; 30-yr landscape change; landscape-based digital model for Accomac and Northampton Counties, ESVA; monthly extratropical storm record 1885-2002	Publicly available online on Environmental Data Initiative (EDI) data portal
United States Department of Agriculture (USDA)	Crop production (e.g., crop yield, area planted), demographics (e.g., number of farmers), prices (e.g., agricultural prices, land values), environmental information (e.g., agricultural chemical usage report), cropland data (e.g., CropScape), and crop insurance information (from USDA-RMA)	Publicly available online

Table D.1. Data Sources, Available Information, and Collection Methods. The table lists some of the data sources that will be used in the proposed project. The data discovery phase and workshops will help build on these data sources. Documentation of available data sources (descriptions and collection methods) will be shared with the research community.

1.2 Storage and Access. To support exploration of available dataset(s) from this project, we will organize a relational database management system (e.g., PostgreSQL database) that is accessible via an interactive, searchable web application. The relational database management system allows all data sources to be stored in a centralized repository, but provides the database administrator the capacity to allocate access to some or all data to certain stakeholders based on their security privileges. While we plan to host dataset(s) on a server at the UVA's Biocomplexity Institute over the course of the project, these administrative responsibilities will be passed on to a designated stakeholder (e.g., Eastern Shore of Virginia Climate Adaptation Working Group) after our involvement in the project is over. The code used to generate dataset(s) as well as code used for the analyses will be made available via a publicly accessible GitHub repository under an appropriate public commons license (e.g., MIT, GNU). The repository will be open to pull requests, facilitating a transparent process of code validation and improvement.

2. Dissemination of Resources. The main resources generated over the course of the project will be the climate equity atlas that include socio-economic and environmental projections, datasets, code, stakeholder networks, and workshop materials including data literacy training. Table D.2. lists some of the resources that will be generated, and how they will be stored and shared.

Resources	**Dissemination**
Climate Equity Atlas	Hosted on university server, shared publicly
Stakeholder networks	De-identified and shared on a website
Environmental projections	Climate Equity Atlas; CUAHSI Hydroshare (hydroshare.org)
Workshop materials (e.g., data literacy training)	Shared on a public repository
Datasets	Relational (PostgreSQL) database will be hosted on university server
Code repository	Shared on a public repository (e.g., GitHub)
Analysis, methods, findings	Conferences, publications, reports, archives

Table D.2. Resources and Dissemination. The table lists some of the resources that will be generated in the proposed project, and how they will be stored, and shared.

The findings will be disseminated in the form of peer-review publications in the open literature, technical reports, professional presentations, and open source archives such as arXiv.org. New methods developed during the course of the project for integration of data sources at different geographies, creating the climate equity atlas, social and environmental model projections, and agent-based models will be presented in conferences. The dataset(s) (including relevant metadata and provenance) collected and generated by this project will be assigned both a Persistent URL and a persistent, citable Digital Object Identifier (DOI). A persistent URL is one that never changes, thus links do not break when a website gets updated. DOI is a unique string that is tied to a metadata description of the object as well as to a digital location, such as a URL, where all the details are accessible. The Persistent URL and DOI will be shared publicly on UVA LibraData system (for UVA researchers), and on other leading behavioral and social science dataset repositories, such as the Inter-university Consortium for Political and Social Research (ICPSR).

3. Institutional Review Board (IRB). All members of the research team will be approved for research with human subjects. Overall activities of the project (data collection, interviews, surveys, workshops, analysis, and dissemination) will secure approval of the IRB prior to commencement of research activities, in accordance with university policy and best practice. Issues of risk to the community (i.e., privacy, economic consequences, etc.) will be mitigated where necessary to maintain institutional compliance and community trust. We will follow IRB protocol for incentivized behavioral experiments to study decision-making.

POSTDOCTORAL RESEARCHER MENTORING PLAN

This **Postdoctoral Researcher Mentoring Plan** has been prepared by the Biocomplexity Institute & Initiative (BII) at the University of Virginia. It establishes guidelines for work to be performed by a Postdoctoral Researcher (PR) in support of this project. The plan begins with the hiring and recruitment of a PR who has a requisite match between their expertise and professional objectives and the skills needed for the proposed project; additional training and professional development will be offered by the PI, as needed. The PR assigned to the project will work in the Social & Decision Analytics Division (SDAD) of the BII. He/she will work on all the topics of the proposal, and will help in mentoring any undergraduate and graduate students associated with the project. The PR will work in a rich synergistic and interdisciplinary environment that features unique educational opportunities.

Orientation and Career Counseling. The PI will guide the PR, starting with an overview and insights about the project goals, as well as the expectations in SDAD related to research practices, interaction with colleagues, and student mentoring. The PI will work closely with the PR to establish and implement an Individual Development Plan. Career counseling will be directed at providing the PR with the skills, knowledge, and experience needed to excel in his/her chosen career path. The UVA SDAD team offer wealth of collaboration opportunities and access to a variety of university level programmatic efforts, seminar series, journal clubs and interdisciplinary forums where the PR can interact in person with junior as well as senior faculty, scientists from a range of disciplines and graduate students across the university schools, centers, and programs, such as the Darden School, the Data Science Institute, the Center for Open Science, and also with researchers at other universities and research organizations.

Training and Resources. The PR will gain training in professional research by completing and passing the "responsible conduct of research" module through the online Collaborative Institutional Training Initiative (CITI).[1] In addition, the PR will be asked to read and discuss with the PI several documents including the National Academy of Sciences guide to responsible science[2], the American Statistical Association's guide to ethical statistical practice[3], and the American Physical Society's guidelines for professional conduct.[4]

Publications and Presentations. Regular publications are expected to result from the work supported by the grant. These will be prepared under the guidance of the PI and there will be travel funds to attend conferences to present the research. The PR will receive guidance in the preparation of manuscripts for scientific journals and presentations at conferences.

Experience with Preparation of Grant Proposals. The PIs will also guide and train the PR in proposal writing in preparation for the next stage of his/her career. The PR will have an opportunity to learn best practices in proposal preparation including identification of key research questions, definition of objectives, description of approach and rationale, and construction of a work plan, timeline, and budget.

Success of the Mentoring Plan will be assessed by monitoring the personal progress of the Postdoctoral Researcher toward his/her career goals.

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[1] CITI, [www.citiprogram.org/rcrpage.asp?language=english&affiliation=100]
[2] National Academy of Sciences, Engineering, and Medicine, 2009. *On Being a Scientist: A Guide to Responsible Conduce in Research: Third Edition.* Washington, DC: The National Academies Press. https://doi.org/10.17226/12192.
[3] https://www.amstat.org/ASA/Your-Career/Ethical-Guidelines-for-Statistical-Practice.aspx
[4] https://www.aps.org/policy/statements/02_2.cfm

LIST OF PROJECT PERSONNEL AND PARTNERS

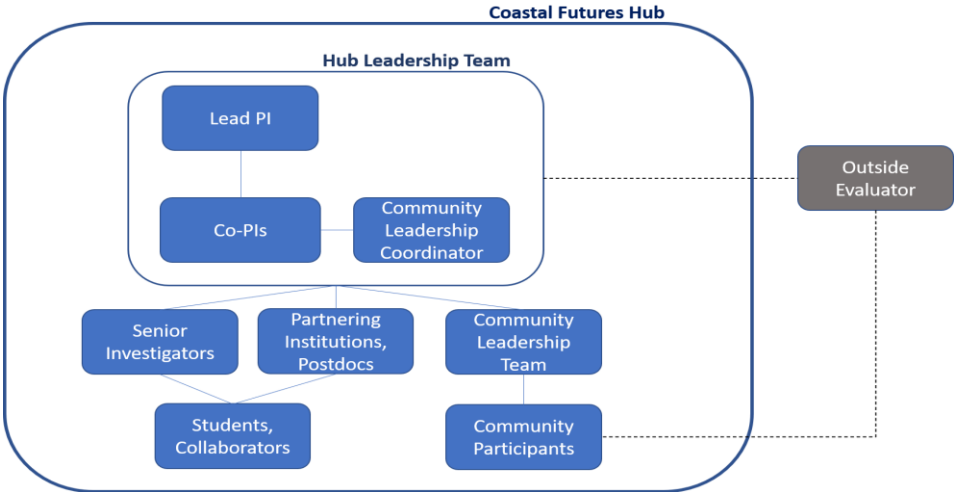
Table 1. List of Coastal Futures Hub project personnel

Investigator	Affiliation	Role
McGlathery, Karen	University of Virginia	Lead PI
Band, Larry	University of Virginia	Co-PI
Korkmaz, Gizem	University of Virginia	Co-PI
Lakshmi, Venkat	University of Virginia	Co-PI
Wilson, Barbara Brown	University of Virginia	Co-PI
Andrews, Elizabeth	College of William & Mary	Senior Investigator
Claibourn, Michelle	University of Virginia	Senior Investigator
Denckla-Cobb, Tanya	University of Virginia	Senior Investigator
Culver, Teresa	University of Virginia	Senior Investigator
Goldstein, Josh	University of Virginia	Senior Investigator
Shafiee-Jood, Majid	University of Virginia	Senior Investigator
Wiberg, Patricia	University of Virginia	Senior Investigator
Yusuf, Wie	Old Dominion University	Senior Investigator
King, Angela	College of William & Mary	Other Personnel
Fogel, Jonah	University of Virginia	Other Personnel
Gladfelter, Sierra	University of Virginia	Other Personnel
Johnston, Cora	University of Virginia	Other Personnel
Kramer, Brandon	University of Virginia	Other Personnel

Table 2. List of Coastal Futures Hub partners who have contributed to proposal

Partner	Organization Type
University of Virginia	Institution of Higher Education
Department of Environmental Sciences	
Department of Engineering Systems & Environment	
Institute for Engagement & Negotiation	
Biocomplexity Institute	
Equity Center	
Environmental Resilience Institute	Institution of Higher Education
College of William & Mary	
Coastal Policy Center	Institution of Higher Education
Old Dominion University	
Institute for Coastal Adaptation & Resilience	
Accomack-Northampton County Planning Commission	State/Local Government Non-Governmental Organization
The Nature Conservancy	Non-Governmental Organization
ESVA Climate Action Working Group	State/Local Government
Department of Natural Resources	State/Local Government
Department of Water Quality	State/Local Government
Virginia Cooperative Extension	Citizen Group
Citizens for a Better Eastern Shore	Non-Governmental Organization
Master Naturalists Eastern Shore Chapter	Non-Governmental Organization
Virginia Eastern Shore Land Trust	

PROJECT MANAGEMENT PLAN



The governance and administration of the Coastal Futures Hub involves a Leadership Team led by the Principal Investigator (PI) and supported by Co-Principal Investigators and the Community Leadership Coordinator (Fig. 1). The Hub Leadership Team has the primary decision-making responsibilities for the project, with the Lead PI having the final decision on issues related to funding, research, and personnel. The Lead PI is responsible for project communication, including timely annual reports to the NSF, facilitating scientific meetings, and long-term research planning. Lead PI K. McGlathery is Professor of Environmental Sciences, Director of the Environmental Resilience Institute and has served as the Principal Investigator of the Virginia Coastal Reserve LTER site since 2005. Co-Principal Investigators include: L. Band, B. Wilson, V. Lakshmi, and G. Korkmaz. L. Band holds joint appointments as both the Ernest H. Ern Professor of Environmental Sciences and as a Professor in the Department of Engineering Systems and Environment. His work in eco-hydrology has focused on relationships between hydrologic systems and human influences. B. Wilson is an Associate Professor in the School of Architecture who focuses on community resilience and co-production, and is a founding co-director of the University of Virginia's Equity Center, leading work on data democratization; she also serves on the university's Racial Equity Task Force. V. Lakshmi is a Professor in Engineering Systems and Environment currently serving on the NAS Water Science and Technology Board. His research focuses on the use of remote sensing and big data in water resource management. G. Korkmaz is an Associate Professor at the Social and Decision Analytics Division (SDAD) of the Biocomplexity Institute & Initiative. Her research uses mathematical and computational modeling to describe the interplay between socio-economic network structures and strategic decision-making. Co-PIs are responsible for working with Senior Investigators, Postdocs, Students, Partner Institutions, the Community Leadership Coordinator and team-members, and other collaborators to complete the work-tasks identified in the proposal in an inclusive, representative, and equitable manner. The Community Leadership Coordinator will be recruited through stakeholder engagement within the ESVA study region. In addition to serving on the Hub Leadership Team, the Community Leadership Coordinator is the principal point of contact for Hub researchers and will recruit members of the Community Leadership Team and Community Participants. The Community Leadership Coordinator and the Co-PIs have co-equal power within the leadership team.

Leadership Team: The Leadership Team will coordinate activities among Senior Investigators and other personnel engaged in implementing Hub Tasks. Senior Investigators include: Elizabeth Andrews (Director of William & Mary Law School's Virginia Coastal Policy Center), Tanya Denckla-Cobb (Director of UVA's Institute of Engagement and Negotiation), and Wie Yusuf (Associate Professor of Public Policy and Steering Committee Chair, ODU Resilience Collaborative), who are all affiliated with the Resilience Assessment Feasibility Tool (RAFT); Michele Claibourn (Director of Research Data Services and the Social, Natural, and Engineering Sciences at the University of Virginia Library and Faculty Director, Lead

Data Scientist Democratization of Data at the UVA Equity Center); Teresa Culver (Associate Professor Engineering Systems and Environment at UVA); Josh Goldstein (Research Assistant Professor with Social and Decision Analytics Division at UVA's Biocomplexity Institute); Majid Shafiee-Jood (Assistant Professor with Engineering Systems and Environment at UVA); Patricia Wiberg (Professor in Environmental Science at UVA with a focus on the impact of climate change on storm surge and coastal geomorphology). Other personnel include: Angela King (Assistant of Director of William & Mary Law School's Virginia Coastal Policy Center); Jonah Fogel (Program Manager of UVA's Environmental Resilience Institute); Sierra Gladfelter (RAFT Project Manager at UVA's Institute for Engagement and Negotiation); Cora Johnston (VCR-LTER Site Director); Brandon Kramer (Postdoctoral Research Associate in the SDAD division of UVA's Biocomplexity Institute).

Promoting Diversity: Researchers involved with the Hub are demographically, functionally, and academically diverse. Our diversity ensures opportunities for meaningful social and professional growth within the Hub. We will draw from our experiences informally and formally as professionals with diverse backgrounds to strengthen and promote a culture of inclusivity and a growth mindset. We will involve early-career scientists in the proposed work, including a post-doctoral research associate under the direction of Biocomplexity Institute & Initiative at the University of Virginia, and pre-tenured faculty. The post-doc will be mentored and managed in accordance with the Hub's Postdoctoral Mentoring Plan. We will work with institutional Equal Opportunity liaisons to identify advertising opportunities for the postdoctoral position that will reach traditionally underrepresented groups. The proposed work is designed so that the postdoc will engage with faculty in a range of fields and career stages.

Education and Training: We will use a tiered mentoring model connecting faculty, graduate and undergraduate students, and high school students. Leveraging the education program of the VCR LTER, the project will engage four high school students per year as Coastal Futures Interns. These students will work as research assistants to Hub activities during the summer and will be intentionally recruited through community and teacher partnerships to enhance participation of traditionally underrepresented groups. We will also provide opportunities for two undergraduate students to work with the project team each summer. In addition, two undergraduate students and one graduate student from Coastal Futures Hub each summer will collaborate with others in the Biocomplexity Institute's Data Science for the Public Good Young Scholars Program where students work with stakeholders from multiple sectors to develop data-driven solutions to local community issues.

Leaders with Lived Experience: The Coastal Futures Hub is an inclusive and representative process of knowledge co-production between the research team and the host community for all phases of the research process. The organization of the Hub reflects that goal by including representation of the community within the administrative structure of the Hub. The Community Leadership Coordinator will be hired in year one of the Hub, with additional local team members hired in years two through five. Local leaders will grow their capacity to own and maintain the Coastal Futures Hub beyond the life of the funded program. The Community Leadership Coordinator and team-members support research activities, project management, education, and outreach within the Hub. The Coordinator has the day-to-day responsibility of coordinating the Local Team activities related to research, education, and outreach. The Coordinator and team-members report to the Lead PI.

Coordination and Integration across the entire research group including PIs, post-doc, graduate students, undergraduate students, technical staff and affiliated investigators is important to continual development of the Hub. The lead PI, in consultation with the Hub Leadership Team, will be responsible for integrating and coordinating research planning. The Leadership Team will meet quarterly by videoconference to discuss project tasks, priorities and integration. These meetings will be instrumental in helping us plan research activities and discuss ideas as they evolve. The entire Hub research community will have an **Annual "All Hands" Meeting** on the ESVA. The meeting will include informal presentations and working groups including all team members. We will especially encourage students and postdoc to present their

research at the annual meeting. These meetings will allow us to formally evaluate our progress and will be critical to integrating the multiple phases of the biophysical and social science work.

Prioritization of Hub Activities

The Coastal Futures Hub relies heavily on co-production as a means of developing research insights. At all stages of the research process, the community's voice will provide important guidance into the direction and utility of each task output. The hubs organizational structure is designed to support power sharing across the research team and community participants. Data literacy training, technology tutorials, and facilitated workshops enhance the capacity of the community to participate in this shared discovery process. The long-term objective of the Hub is to empower the community to produce new insights for their own purposes through the Climate Equity Atlas and associated tools.

Input from the community will guide the creation of decision support tools as they relate to water security issues (i.e. soil and groundwater water salinity and coastal flooding). It is expected that as the community's capacity to participate in research activities increases, their perspective will shift from short-term to long-term strategies for management. Likewise, the research community's perspective of the enhanced and research products will reflect their learning from the community as they take local knowledge and decision-making into account. It is an important priority of the Hub to democratize data, broaden participation to include diverse community stakeholders, and amplify voices not typically engaged in the climate adaptation dialogue. Furthermore, over the course of the project, environmental events will also provide insights that guide and prioritize the development of relevant decision tools by the community. For example, if a storm event were to cause street flooding or farm field abandonment due to increased salinity, community feedback would inform the focus of the decision support tool to be most relevant to community interests.

Evolution of Hub Leadership

The Hub leadership team is an inclusive administrative body with power sharing between community interests and the research community. Likewise, the research community and Hub partners are diverse, including specialties in both natural and human systems, and in data science. New areas for exploration will be surfaced as priorities of the community change, evaluating findings identify areas for improved participatory methodologies, and modeling outputs lead to community insights. The Hub Leadership Team will use consensus decision-making processes to reconsider the composition of the Leadership Team as necessary to ensure the Hub collaboration remains healthy.

The Hub's data management infrastructure enables expansion and revision as additional questions emerge from the community, and insights from previous research guide future areas of inquiry. It is expected that implementation of coastal strategies derived from Hub insights will have dependencies decoupled from the Hub's primary focus. For example, costs of implementation or public policy adjustments may need to be considered before action can be taken. These dependencies will be treated as endogenous within the coupled socio-environmental system, spurring additional study, rather than contextual issues. Additional research will be necessary to identify strategies to remove barriers to implementation. Likewise, science discoveries about feedback between human and natural systems will likely require additional studies, feeding back into the adaptive composition of the Hub research community.

Timeline

The Coastal Futures Hub is composed of five interdependent tasks. Information collected in Tasks 1 and 2 will be used to produce Task 3. Task 4 is used to integrate Task 1, 2, and 3 work products into an interactive decision-support tool. Task 5 is central to all aspects of the Hub through training, research workshops, and focus groups at various times. Hub Administration will enable regular adjustments to the performance of the Hub. An NSF midpoint review will be scheduled in year three. A final report will be provided to NSF at the conclusion of year five, in accordance with grant guidelines.

Task ID		Lead Investigators	Year 1	Year 2	Year 3	Year 4	Year 5
Task 0	**Hub Administration**	McGlathery (PI)					
0.1	Quarterly Research Update	McGlathery, PIs, Sr. Investigators					
0.2	Annual Hub Evaluation	McGlathery, PIs, Sr. Investigators					
0.3	NSF Midpoint Review	McGlathery, PIs, Sr. Investigators					
0.4	Final Report	McGlathery, PIs, Sr. Investigators					
Task 1	**Environmental Data, Information Sources, and Modeling**	Band, Lakshmi (PIs)					
1.1	Assess Environmental data and information sources	Culver, Lakshmi, Band, McGlathery					
1.2	Hydrological modeling development	Culver, Band, Lakshmi					
1.3	Storm Surge Modeling of Coastal Flooding development	Wiberg					
1.4	Model refinement	Culver, Lakshmi, Band, McGlathery					
Task 2	**Socio-Economic Data, Information Sources, and Modeling**	Wilson, Korkmaz (PIs)					
2.1	Social Equity Atlas	Claibourn, Wilson					
2.2	Generating Synthetic Information	Goldstein, Korkmaz					
2.2.1	Data Discovery	Wilson, Korkmaz, Kramer					
2.2.2	Data Inventory and Collection	Wilson, Korkmaz, Kramer					
2.2.3	Data Integration, Analysis, and Modeling	Wilson, Korkmaz, Kramer					
2.3	Assess Stakeholder Networks	Kramer, Korkmaz					
Task 3	**Coupled Socio-Environmental Model**	Korkmaz, Band, McGlathery (PIs)					
3.1	Create Agent-based Model	Shafiee-Jood					
3.2	Decision-making Experiment	Shafiee-Jood					
Task 4	**Climate Equity Atlas**	Wilson, Korkmaz (PIs)					
4.1	Develop a data science infrastructure	Claibourn, Goldstein, Wilson					
4.2	Integrate models from Tasks 1, 2, and 3	Band, Culver, Wiberg, Shafiee-Jood, Lakshmi, Goldstein, Kramer, Wilson, Claibourn					
4.3	Feedback, update and use case development with community	Band, Culver, Wiberg, Shafiee-Jood, Lakshmi, Goldstein, Kramer, Wilson, Claibourn					
4.4	Publish publicly accessible maps of assets/risk	Claibourn, Goldstein, Wilson					
Task 5	**Stakeholder Engagement**	Wilson (PI)					
5.1	Engage Community Leaders with Lived Expertise	Denkla-Cobb, Anderson, Yusuf, Wilson, McGlathery					
5.1.1	Engaging Local Leaders	Denkla-Cobb, Anderson, Yusuf, Wilson, McGlathery					
5.1.1.1	Hire local leader	Denkla-Cobb, Anderson, Yusuf, Wilson					
5.1.1.2	Hire local team to support local leader	Denkla-Cobb, Anderson, Yusuf, Wilson					
5.1.2	Narratives and Community Events	McGlathery, Wilson, Denkla-Cobb, Anderson, Yusuf					
5.2	Community Workshops and Focus Groups	Denkla-Cobb, Anderson, Yusuf with PIs and Sr. Investigators					
5.2.1	Learning in Places Curriculum	McGlathery					
5.2.2	Research Experiences for High School Students	McGlathery					
5.2.3	Research Experiences for Undergraduates	McGlathery with PIs and Sr. Investigators					
5.2.4	Data Science for the Public Good Young Scholars	Korkmaz					

Dissemination of Results

A website designed for this project will make results available to scientists, stakeholders and policy makers. The project website will include the Climate Equity Atlas dashboard, and descriptions of major findings, models, future scenarios and graphics of results. The focus groups, stakeholder meetings and workshops will be an important conduit of research findings to the local community. The Community Leadership Team will benefit directly from these efforts. The approach and lessons learned in establishing the Coastal Futures Hub will be shared more broadly to community participants. We will make our findings accessible to the general public via the web infrastructure developed in Task 4. Our major research findings will be presented in open-access peer-reviewed publications in journals with a high impact and orientation to inter- and transdisciplinary research. The project data will be hosted in accordance with the Hub's data management plan.

RESULTS OF PRIOR SUPPORT

McGlathery (PI), and Wiberg (co-PI): NSF awards #DEB 123773, 1832221. Virginia Coast Reserve (VCR) LTER, 2012 - 2018, $5,929,993; 2018 - present, $2,288,892). McGlathery has been lead PI since 2005, and Wiberg is one of four Co-PIs on the Executive Committee. Intellectual Merit: The VCR LTER is an interdisciplinary research project that investigates climate drivers, landscape linkages, and feedbacks (ecologic, geomorphologic, hydrologic) that drive ecosystem state change in coastal barrier systems using long-term observations, experiments, and modeling. Relevant to the proposed Coastal Futures Hub are long-term data on sea-level rise, coastal storm surge modeling, and long-term observations and experiments on marsh migration and forest loss due to saltwater inundation along the Eastern Shore of Virginia. Broader Impacts: The last funding cycle (2012 - 2018) produced 190 journal articles (including 9 in Nature, 1 in Science, 4 in PNAS), 24 book chapters, 2 books, and 40 graduate theses/dissertations. In the last funding cycles, McGlathery and Wiberg have published 56 journal articles. The present cycle has produced 30 publications in its first year. The VCR LTER supports 10 - 25 graduate and undergraduate students each year; the K - 12 Schoolyard program serves the two local counties that are both majority-minority districts with all Title 1 public schools, where >70% of students receive lunch support. Every one of the 200 students is exposed to LTER science at least twice during high school; fellowships provide place-based research experiences for 2 - 4 high-school students each summer. A new family-based "Learning in Places" program is geared toward middle school students where score discrepancies on standardized tests between races and social groups reach 12%. VCR LTER provides professional development and training programs for local public school teachers. Partnerships with The Nature Conservancy, other individual stakeholder groups (e.g., Citizens for a Better Eastern Shore, Master Naturalists), and the Eastern Shore Climate Adaptation Working Group connects research findings with policy and management. Results of VCR LTER research was the basis for a VA bill on carbon trading for underwater plant restoration.

Band (co-PI): NSF awards #DEB 1637661, 1855277. Baltimore Ecosystem Study (BES) LTER, 2011 - 2017, $6,174,561; 2017 - present, $2,323,110. Band was Co-I and lead for subcontracts to the University of North Carolina and the University of Virginia. Intellectual Merit: The BES LTER is an interdisciplinary research project that addresses three questions that reflect the complex nature of urban ecosystems: 1) How do hydrology, ecosystem nutrient transformations, and social factors affect transport and retention of nutrients and contaminants by urban watersheds; 2) How do species composition and structure of biological communities respond to a complex set of biophysical and social processes; and 3) How do human choices about land management interact with watershed dynamics and the structure of biological communities? Relevant to the proposed Coastal Futures Hub were the development of long-term socio-environmental data and models linking parcel management with patch to watershed carbon and nutrient cycling, stormwater, streamflow, and flood hazard, and the response of people at parcel to city levels to manage these processes. Broader Impacts: In the last funding cycles, Band produced 15 journal articles, 2 book chapters, and 2 dissertations, with another continuing. Three post-doctoral fellows were fully or partially supported. Software was co-produced with stormwater utility personnel from Baltimore City, Baltimore County, and three other jurisdictions for participatory modeling of new green infrastructure (GI) at the parcel to catchment scale. The software operates in the cloud, and links advanced ecohydrological and stormwater models with a web interface for stakeholders to co-design new GI which is then translated into the models to rapidly assess changes in water, carbon and nutrients footprints. Advanced visualization makes use of Google Streetview to render new trees and other GI from aerial and perspective (street level) views. The software was demoed for Baltimore stormwater engineers, landscape architects and citizen watershed associations, and is being further developed.

Korkmaz (co-PI): NSF award #49100420C0015. Proposal in Response to Solicitation #49100420R0012, 2020-2022, $1,500,000. Intellectual Merit: The project leverages data science capabilities and methods to manage, analyze, and extract knowledge from the volumes of data

emerging as a result of today's data revolution. In collaboration with NSF's statistical agency, National Center for Science and Engineering Statistics (NCSES), we are assessing the feasibility of using non-survey data flows to develop rigorous and repeatable data science methods to supplement or enhance the establishment of important national science policy indicators. Broader Impacts: By engaging junior researchers, providing hands-on training for graduate students and undergraduates in a multidisciplinary environment, we are contributing to increasing the capacity of a diverse group of scholars able to engage directly with big data, modeling, and programming. The findings from the Data Science for the Public Good Young Scholar Program was presented at the Annual Symposium (https://datascienceforthepublicgood.com/events/symposium2020/poster-sessions/oss).

A-NPDC

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August 31, 2020

To Whom it May Concern:

If the proposal submitted by Dr. Karen McGlathery and colleagues entitled *"Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities"* is selected for funding by NSF, it is my intent to collaborate as detailed in the Project Description.

If you have any questions about our support and prior experience working with communities and academic institutes on coastal resilience and adaptation, please contact me at 757-787-2936 ext. 115, or salexander@a-npdc.org.

Sincerely,

Shannon Alexander
Director of Planning

The Nature Conservancy
Protecting nature. Preserving life.

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Virginia Coast Reserve
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Nassawadox, VA 23413

Tel (757) 442-3049
Fax (757) 442-5418

nature.org

August 31, 2020

To Whom it May Concern:

If the proposal submitted by Dr. Karen McGlathery and colleagues entitled *"Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities"* is selected for funding by NSF, it is my intent to collaborate as detailed in the Project Description.

Sincerely,

Jill Bieri
Director, Virginia Coast Reserve
The Nature Conservancy

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Old Dominion University
Norfolk, VA 23529

Dr. Wie Yusuf, Assistant Director
jyusuf@odu.edu

August 29, 2020

To Whom it May Concern:

If the proposal submitted by Dr. Karen McGlathery and colleagues entitled *"Focused CoPe: Coastal Futures: Building Capacity for Data-driven Adaptation in Rural Coastal Communities"* is selected for funding by NSF, it is my intent to collaborate as detailed in the Project Description.

Sincerely,

Dr. Wie Yusuf
Assistant Director, ICAR
Professor, ODU School of Public Service