Assessment of the Gulf Coast Environmental Justice Landscape for Equity (AGEJL-4-Equity)

Four environmental justice networks convene around the "Communiversity" model with expert university-based support to map underserved Gulf Coast community stakeholder priorities & co-create a landscape analysis to inform next steps for engagement with NASA open Earth science as an evidence base for both greater equity in mitigating cumulative impacts of environmental injustice and preventing increased inequality due to climate change-related severe weather

Section 1.0 Table of Contents

2.0 AGEJL-4-Equity Objectives, Technical Approach & Management

2.1 AGEJL-4-Equity Overview: Four Equity and Environmental Justice (EEJ) networks will convene to map Southern Gulf Coast, primarily African American, underserved EJ communities and their priorities: the National Black Environmental Justice Network, the Historically Black College and University-Community Based Organization Gulf Coast Equity Consortium, the Deep South Center for Environmental Justice (DSCEJ) Community Advisory Board, and the Environmental Justice Forum. Tulane University School of Public Health and Tropical Medicine (Tulane) and DSCEJ will provide capacity development-centered support through an Earth science-focused adaptation of the tried-and-true Communiversity participatory assessment model. Author, EEJ organization leader, and member of the White House Environmental Justice Advisory Council (WHEJAC), Dr. Beverly Wright will co-lead support with Dr. Nathan Morrow who together have more than 50-years of combined experience with inclusive participatory assessment. Dr. Morrow also continues to apply geospatial analysis of NASA products to social and environmental challenges following-on from his early research contributing to the NASA MODIS, NPOESS, and Land-Use-Land-Cover-Change missions. Each EEJ network will be empowered with participatory mapping tools developed by Dr. David Padgett of Tennessee State University and supported with a common multi-disciplinary multi-perspective EEJ analytical frame. Simple but effective comparative analysis between participating networks will help pinpoint specific potential use cases for lowering barriers to access and promoting innovative applications. A reflection on the findings in comparison to other regions and national EEJ context will further deepen understanding of the distinct Southern underserved community distributional justice challenges related to wellbeing and risk exposure as well as opportunities to improve procedural justice by increasing participation, recognition, and agency with NASA open Earth science. By leveraging existing networks and deep wells of located and experiential expertise, the Assessment of the Gulf Coast Environmental Justice Landscape for Equity (AGEJL-4-Equity) project will have delivered not only a novel and comprehensive Landscape Analysis identifying gaps and opportunities for improved access and use of NASA open science products to advance EEJ in underserved communities along the Gulf Coast, but a validated engagement model that advances the capacities of EEJ networks and communities themselves.

2.2 Southern Gulf Coast Relevance for Advancing EEJ with NASA Open Science
Environmental damage and climate change related hazards are unequally distributed in communities on Earth in patterns that are often observable from space. Inequity and environmental injustice occurs when the uneven distribution of any of the broad range of environmental ills is coincident or collocated with marginalization of groups of people and increased vulnerability of underserved communities. Unfair exposure to hazards, harm to health and wellbeing, and systemic barriers to participation in life and livelihood-affecting decisions may be mitigated, remedied, or avoided -- at least in part -- through improved capabilities and recognition of affected people to use Earth science, including

NASA open science, as an evidence base to frame EEJ decision making and solutions in an inclusive and scientifically valid way.

Southern institutions and organizations were disconcertingly underrepresented in the first NASA Equity & Environmental Justice Listening Workshop (NASA ESD, 2021). EJ community context, stakeholders, issues and drivers differ by region. Comparative analysis helps to appreciate this important diversity of experience to highlight evidence gaps such as the intersection of hurricane vulnerability and point source pollution on the Gulf Coast. The first Federal investigation into environmental injustice as racial inequality found 3-of-4 hazardous waste sites in the southern States located in African American communities (GAO, 1983). Disproportionate burden of environmental ills sited in segregated and disempowered communities, according to Dr. Robert Bullard's foundational environmental justice treatise *Dixie Dumping: Race, Class, and Environmental Quality* (1990), "placed African American and poor communities on the frontlines of environmental assault". As Catherine Coleman Flowers, member of WHEJAC, noted:

> "There is a need for additional discussion about how to work together and collaborate more broadly around a movement toward climate and environmental equity and justice in the South. The South offers lessons about some of the worst environmental challenges and most severe disasters in the nation. These lessons learned can inform work on these issues across the nation." -- (NAS, 2021)

The overall goal of the AGEJL-4-Equity project is to advance EEJ and those that work to advance EEJ on the Gulf Coast by engaging underserved community networks in geospatial technology-assisted participatory assessment process. While flexible enough to be adapted to reflect on the potential of NASA Open-source Science and data products, the "Communiversity" model safeguards against a potentially extractive or exploitative process by ensuring EJ communities are equal active participants in research (Bullard & Wright, 1993). This autochthonous equity-focused participatory process, advanced alongside the EEJ movement in the South, makes community voices heard through engagement, capacity development, and recognizing diverse knowledge contributions with the support of university-based experts to present environmental justice problems and policy solutions in a scientifically valid way.

2.3 Research for Advancement Objectives alignment and their significance

AGEJL-4-Equity seeks in all activities to align with recent executive orders that advance equity by focusing programmatically on underserved communities in White House Executive Order 13985 and intentionally promote diversity, inclusion and accessibility as described in White House Executive Order 14035. Dr. Beverly Wright, the AGEJL-4-Equity Co-Investigator, serves on the WHEJAC that was created in response to White House Executive Order 14008 that calls for a redoubling of efforts to understand domestic impacts of environmental and climate change. Inclusive processes to EEJ and principles of the Communiversity model are evident in recommendations that signature EJ initiatives, such as the Climate and Environmental Justice Screening Tool, have us-

er-friendly capacity development, technical assistance and consultation that fully engages and possibly is co-led by underserved and EJ communities (WHEJAC, 2021).

The ESD Applied Science Program promotes measurable social benefit from NASA research and information products with the aim to improve decision making and related policy solution implementation. Clearly defining 'who' and 'where', as proposed by AGEJL-4-Equity, is the first step to making improved decision making and social benefit measureable. As with action research for EEJ, a more inclusive science processes promotes greater consensus around the evidence base for policy formation that in turn advances collective action. Research into the links between Open Science, equity, and environmental justice may demonstrate practical pathways for realizing sustainable and more equitable program benefits for underserved communities. AGEJL recognizes significant synergies for EEJ projects and NASA's mission Transform to Open Science (TOPS); a decade long strategic commitment to lowering barriers to entry for historically excluded communities, better understanding how people use NASA data and code to take advantage of big data collections, and increasing opportunities for collaboration while promoting scientific innovation, transparency, and reproducibility.

AGEJL-4-Equity has identified three Research for Advancement Objectives (RAO) adapted for a southern regional landscape analysis from "key objectives" stated in A.49 Equity and Environmental Justice program element. Each RAO is SMART -- Specific, Measurable, Attainable, Relevant, and Time-Bound -- and calls for specific tasks:

RAO1. **Advance Information** -- Over three-months, engage and capacitate four EEJ networks to map underserved EEJ stakeholder communities, EEJ priorities, ways of working, and knowledge of Earth science-based evidence to advance EEJ decision-making and action, to present as a network-landscape analysis

RAO2. **Advance Organizations** -- Convene network representatives of underserved primarily African American Gulf Coast communities in New Orleans for a two-day participatory workshop of approximately twenty participants to:

   a. Compare and overlay EEJ network community mapping results in a dynamic visualization and synthesize evidence for joint landscape analyses
   b. Interrogate integrated geo-spatial, socio-economic and earth science data, highlighting NASA products and open source science resources, to map EEJ landscape characteristics such as access to data and EJ patterns
   c. Explore existing and innovative ideas to address gaps in evidence that may be addressed by current or planned NASA-related missions and those that will require further data integration and process innovation

RAO3. **Advance Integration** -- Synthesize learning in a comparative 20-page landscape analysis report within 6-months that leverages geolocation to map potential open Earth and social science integration to address evidence gaps and EJ community priorities; reporting on barriers, opportunities and community assets unique to the Gulf Coast context and next steps to advance EJ organizations

As a first significant contribution – AGEJL-4-Equity will have provided an operationally feasible, high quality and cost effective EJ community engagement model. Adapted from the Communiversity approach, NASA and potentially other agencies and organizations will then be able to advance EEJ with evidence-based process leveraging Open, Earth, and related geospatial, historical/political or socio-economic science by inclusive and equitable engagement with the larger EEJ stakeholder community.

As a second significant contribution – NASA will have sponsored the co-creation of a novel regional scale EJ community mapping and priority analysis at the intersection of environmental justice, climate justice and potential cumulative burden. The Tishman Environment and Design Center analysed the philanthropic engagement landscape in the southern region and **found broad misalignment** between environmental "conservation" with more community relevant issues of economic justice, disaster resilience, and empowerment (Baptista, & Perovich, 2020). Morrow et al. (2022) found similar misalignment between goals related to environmental security and human security in international projects that were mitigated when problem analysis begins, as with AGEJL-4-Equity, with the experience and observation of a diversity of stakeholders and front-line communities in a resilience and wellbeing-focused participatory process. Advancing EEJ at the intersection of climate change resilience from a multi-method, multi-scale, multi-disciplinary, and multi-sectoral perspective, the Landscape Analysis will be of professional conference presentation or peer-reviewed publication quality, but also speak a broad audience of decision makers and stakeholders with Southern lessons learned.

As third significant contribution -- AGEJL-4-Equity will have communicated specificities of Gulf Coast EJ community and network priorities with respect to the larger national EEJ policy priorities and discussions. At the same time, AGEJL-4-Equity's comprehensive comparative analytical frame for environmental, social and climate justice relevance of Earth and open science could be revised as a rubric for future assessment or community engagement appraisal.

2.4 Adapted Communiversity analytical frame for NASA EEJ Landscape Analysis
Beginning in the 1990's, DSCEJ pioneered the Communiversity model for participatory data collection and assessment processes that focusses on capacity development and empowering context specific community advancement of EEJ (DSCEJ, 2022). "Community voices must be heard" is a fundamental principle of the process that recognizes equitable value in lived knowledge of those facing environmental injustice alongside more theory-oriented knowledge contributed by the scientific method. Capacity of communities to respond to environmental threats and hazards is developed through workshops, supported by academic university-based experts, to systematically investigate equity and environmental justice landscape in a scientifically valid way. The model has five action research activities to co-create or investigate:

1. Environmental hazards proximity analysis and/or community-based monitoring
2. Risk and harm assessment of toxic exposures, place and group based vulnerability, and disaster resilience

3. Inventory of existing environmental data and identify gaps to be addressed
4. Rights and the duties of communities and governmental agencies; and
5. Capacity requirements to advance evidence-based strategic advocacy

Detailed discussions of data stream processing, sensor technology or satellite platforms are likely to be beyond the scope of the EEJ network and community engagement. None-the-less, Dr. Morrow and Dr. Padgett are previous contributors/investigators on NASA-funded projects and will be sensitive to organizing the final Landscape Analysis for easy alignment with current and future missions or program elements. Instead, EEJ networks will focus on discussing current NASA product EEJ use cases while demonstrating related low barrier NASA data access utilities on the web highlighting capacities of EOSDIS and Socioeconomic Data and Applications Center (SEDAC).

AGEJL-4-Equity analytical frame will explore 1) relevance of current NASA EEJ applications for air quality and climate-related hazards to the Gulf Coast, 2) infrastructure, LULU, water quality, and risk monitoring potential of newly available improvements in spatial, temporal, and spectral resolution data, 3) novel policy, historical and socio-economic data integration. Communiveristy model guidance materials including KI or group interview guides, analysis/mapping protocols, and webinar session plans will be adapted to the to the multi-disciplinary open Earth science-focus of the analytical frame.

Current EEJ applications of NASA data include air quality and climate-related hazards of extreme weather, sea level rise, changes in water availability, flooding and extreme heat (NASA, 2022). A variety of sensors and products are utilized such as Suomi NPP/VIIRS DNB nights at light imagery to monitor disaster recovery; sea level estimates from TOPEX/Poseidon, Jason-1-3/OSTM, OSTM/Jason-2, Jason-3, Sentinel-6 Michael Freilich; climate-related hazards imaging capabilities of TRMM, VIIRS and MODIS; and air quality indicators derived from MISR, SeaWIFS, SeaStar, and MOPPIT. NASA Health and Air Quality Applied Sciences team work will be reviewed. SEDAC gridded data sets and application descriptions will be used as examples in EEJ network engagement. Furthermore, reflection on collaborative science that can engage previously marginalized and underserved communities to better access and use these breakthrough NASA data products will explore synergies with missions such as TOPS and initiatives such as the Multi-Mission Algorithm and Analysis Platform (MAAP).

For EEJ applications typically relevant at neighbourhood scale, current and future NASA missions that will increase spatial, temporal and spectral resolution such as ESDS Commercial Smallsat Data Acquisition (CSDA) Program offer a previously unimaginable potential for addressing EEJ research questions and integrating with socio-economic data. Increased temporal monitoring for EEJ applications has great potential from platforms such as EOS (LANCE) with products such as the MODIS NRT Global Flood Product or **fire monitoring** products -- that may also apply to EEJ monitoring concerns around **industrial fires and accidents**. Landsat 9 and Sentinel 2 integration will provide an unprecedented possibility to track LULU or land degradation over time. Im-

proved monitoring of water quality and localized flooding beyond passive sensors is increasingly possible with active radar or laser sensors such as ICESat-2.

Historical discriminatory policy, particularly for African American communities, is often a predictor of current poor wellbeing outcomes and evidence of environmental injustice as seen in recent research associating current disparities in air quality to historical discrimination in mortgage lending revealed in maps of federal government “Redlining” (Lane et al., 2022). In another investigation using archaeological techniques that could potentially benefit from NASA products, aerial imagery helped identify cemeteries of enslaved people as a predictor of the worst contributors to toxic pollution in Louisiana’s epicentre of environmental injustice referred to as Cancer/Death Alley (Forensic Architecture, 2021). Spatial data sets of socio-economic inequality and historical discrimination such as Roberts et al.’s (2022) “Mapping Inequality” project will also be utilized in participatory mapping and discussions of drivers of environmental injustice.

DSCEJ has extensive experience with funding EEJ work to be done by the most concerned communities and networks. The first step of this process is to negotiate a documented commitment with time bound deliverables from each network partner. The basic set of commitments for each of the EEJ networks are as follows: self-assessment; address any identified capacity gaps; review EJ communities, organizations and priorities; hold a webinar or hybrid conduct a Communiversity Landscape Analysis workshop; prepare maps of EJ communities, organizations and priorities; prepare presentation based on geolocated participatory data collection; attend AGEGJ-4-Equity two-day workshop hosted by Tulane University and DSCEJ; report back to network on learning; and submit timely comments and endorsement of the final EEJ Landscape Analysis.

The participatory process supported by DSCEJ and Tulane is complemented by application of geospatial location mapping utilizing the Climate and Economic Justice Screening Tool spatial data layers (Council on Environmental Justice, 2022). For visualization and comparative analysis, participants will also consider the FEMA (2022) National Risk Index Map. Mapping support, capacity development and co-analysis will use open source mapping tools QGIS and QGIS cloud. A geospatial comparison and data synthesis will also serve as central session of the AGEGJ-4-Equity Landscape Analysis workshop. Resulting maps will be included in final reports and maintained by individual networks and institutions according their ability. Thematic, temporal and spatial comparison will serve as the central method for data synthesis in the final report.

Comparative analysis at national level structured using the EEJ analytical frame will serve as an additional step for the finalizing the AGEJL-4_equity Landscape Analysis. As detailed in the DMP in section 3.2, all information collected will be compliant with NASA SMPD-4 data policy and all documents from meetings or analysis will have unique DOI identifiers and uploaded research sharing site zenodo.org.

2.5 Implementation plan with milestones, risk mitigation & management structure

By working through well-established networks, AGEJL-4-Equity is cost effective and ready for immediate action on a 6-month implementation plan. Each of three phases will conclude with concrete milestone deliverables. Phases build on work delivered in previous phase.

Phase 1—participatory process -- (months 1-3) will include a participatory data collection and assessment processes led by each of the four EEJ networks. A kickoff meeting of EEJ network representatives, DSCEJ and Tulane will inform the Project and Costing plan to be submitted in 30-days. Within the month, each EEJ network will complete a self-assessment of capacities related to the adapted Communiversity participatory engagement process, EJ community mapping, and network-landscape analysis. Tulane and DSCEJ will make individualized support plans for each network. By the end of the third month, each EEJ network will have created a network-landscape presentation.

Phase 2 – specific community cross-sharing and comparative analysis -- (month 4) a Landscape Analysis workshop will be co-hosted by DSCEJ and Tulane in New Orleans. Three-to-five network representatives will be invited and attend a previously scheduled conference at the same venue – the 'Open-source Science Outlook for Environmental Justice". This offers an additional engagement opportunity for the participants to advance their capacity through interaction with open science communities, networks, and experts working on potentially relevant open source tools, approaches and products to forward bottom-up approaches to EEJ such as action research and citizen science. The workshop will first focus on presentation and information exchange. Then, the workshop participants will co-create of a common landscape analysis outline in sessions on comparative analysis of EEJ context and organizations, co-analysis of EEJ priorities, multi-network integration of participatory mapping of underserved and vulnerable communities, and finally a statement on next steps for engagement with NASA data streams and products considering. As a milestone deliverable, a report of the meeting will be posted to Zenodo open access data repository and DOI creation site.

Phase 3 – comparative and landscape analysis finalization -- (months 5 and 6). Dr. Padgett will lead comparative gap analysis, supported by Dr. Morrow and Dr. Wright, to underline potentially distinct EEJ priorities for the southern region compared to information available from other regions in terms of type of hazard, severity, magnitude and comparative impact. This will serve as the final analytical section of the AGEJL-4-Equity Landscape Analysis report that will include 1) introduction articulating the EEJ analysis and potential NASA open science and products relevant in the gulf Coast Context; 2) comparative analysis of priorities, challenges and paths to engagement for networks; 3) synthesis mapping of underserved communities, state of EEJ engagement for evidence, and comparison to other regions; 4) NASA open source science and product relevance; 5) recommended next steps. Pre-print for the open access manuscript will be uploaded.

Risk Mitigation -- Potential sources of uncertainty for AGEJL-4-Equity project plan are primarily related to Covid-19 restrictions. Changing infection trends and health regula-

tions may limit the ability to convene face-to-face gatherings. The PI has recently led a major international organization to pivot a global capacity development program to online. Lessons from this experience include leveraging collaborative online tools for better engagement, fully facilitating virtual sessions with dedicated technological backstopping, and adjusting the length/frequency/tempo of sessions to promote active interaction. Network engagement with coastal communities, local authorities and private sector stakeholders may require appropriate health safeguards and be adjusted to virtual or one-on-one meetings rather than in-person group interviews. The PI will support primary stakeholders to follow Tulane Covid policy when implementing their research and capacity development plans. If one key personnel became ill, the PI, CO-I and senior consultant all have the skills necessary to complete deliverables on time.

Management structure for AGEJL-4-Equity follows principles of the Communiversity model where those closest to the EJ communities and issues set the objectives of the research agenda. The university and network based expertise is focused on supporting.

Dr. Nathan Morrow as principle investigator is accountability for grant implementation, compliance, risk management and reporting -- supported by an experienced R1-level sponsored project team at Tulane University. Dr. Morrow is also responsible for maintaining the control environment, quality and timeliness of all deliverables, implementation of the data management and inclusion plan, and responsive communication and reporting to NASA and all stakeholders. He is responsible for NASA requests for "Communication, Outreah and Inreach" and will be lead author of Landscape Analysis.

Dr. Beverly Wright as Co-Investigator supported by DSCEJ is accountable for the fidelity of the proposed activities and deliverables to the principles of Communiversity. Dr. Wright, supported by experienced staff and volunteers, will direct workshop design and day-to-day engagement with networks and Tulane. DSCEJ is responsible engage directly with networks' appoint representatives to administer necessary travel and honorarium payments. Dr. Wright will be co-lead author of the final Landscape Analysis.

Dr. David Padgett is Senior Consultant to Tulane University for comparative analysis and participatory mapping. He will advise on participatory mapping component of data collection and data synthesis during the workshop. He will co-lead the workshop and is responsible for collecting all necessary information from the networks and workshop for comparative and landscape analysis finalization. He will contribute a technical review and as a contributing author on the Landscape Analysis.

Doctoral candidate Mom Kefeyin TatahMentan, MPH will manage support on background evidence scan and support networks with self-assessment and capacity building. She will liaise with Drs. Morrow, Wright and Padgett to provide additional capacity support to networks as needed in completing their network-landscape presentations. She will assist in managing the workshop, ensuring information is handled as per DMP, and fully collaborate on analysis and reporting activities.

Section 3.0, Bibliography, Data Management Plan, Schedule, and Inclusivity Plan

Section 3.1 AGEJL Proposal Bibliography

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3.2 Data management plan

Accountability for full implementation of the Data Management Plan (DMP) and ensuring full compliance to NASA DMP requirements lies with the Dr. Nathan Morrow as PI. He has extensive experience managing geographic and remotely sensed data for research and decision making. He has published peer reviewed articles on data for decision making (Mock, Morrow & Papendeick, 2012) has written and taught about data responsibility (Morrow, 2022), and recently was awarded a grant for increasing the use of Open-source Science for Environmental Justice.

This is an innovative project that includes gathering data from community-based networks as well as professional researchers. To address potential privacy, ethical and consent issues, the AGEJL-4 Equity team will conduct a Privacy Impact Assessment (PIA), following the NASA PIA Summary as a template, on each network's plan for gathering information for their network-landscape analyses. As a general privacy safeguard, data will only be collected, analyzed or presented at spatially aggregated at community or census track level. No data will be collected about individuals. Results of the PIA will be reviewed and all identified potential risks will be mitigated or eliminated by substituting lower impact data collection approaches. When key informants or group interviews are conducted, a standard informed consent statement will be distributed with personal contact information of the PI for any follow up questions about how the data will be used. All interview guides will follow templates that follow guidance criteria for an IRB exemption. Any participatory contributions from networks or community members will be able to be retracted through the telephone, email and snail-mail address details that will be provided to all participants.

The AGEJL-4-Equity team will pursue the development plan along the lines of the "Geosciences Paper of the Future" with the intention move towards improving the DMP "to make data, software, and methods openly accessible, citable, and well documented" (Gil et al., 2016) and the FAIR principles: Findable, Accessible, Interoperable, & Reusable (Wilkinson et al., 2016). As part of the advancement of EEJ data for decision making methods and with the specific expertise in the AGEJL-4-Equity science leadership in this research area, the team will seek ways to ensure data and information are shared in ways that maximize access, reuse and application to new problems, contexts, and research questions. Data will be made publically available with enough detail to allow for validation and metadata standards will conform to requirements of the designated repository and is expected to be coded in XML.

The AGEJL-4-Equity data management plan ensures public access to publications and digital datasets arising from NASA research. All AGEJL-4-Equity data posting and archiving tasks will be **completed by the fifth month** of the project. The preprint will be posted by the sixth month and open access article will be available as soon at final revisions are accepted, but expected to be within one year from project closure. Data and documents will be posted on data archive, preprint and journal sites that all plan to make the materials openly accessible indefinitely.

Data sets, meta data and other materials developed to support the proposed research will be archived at data.nasa.gov, as appropriate, and Zenodo (https://zenodo.org/) site associated with European Organization for Nuclear Research (CERN) and expected to maintain the open archive as long as CERN exists. AGEJL-4-Equity has created an Environmental Justice 'community' on Zenodo to encourage findability of the research and exchange with other EEJ researchers. A preprint of a peer reviewed journal article describing the landscape analysis approach and findings will be posted on Earth and Space Science Open Archive, associated with the American Geophysical Union, preprint server https://www.essoar.org/. The article will then be submitted to journals offering open access. Wiley and potentially other publishers have an agreement in place with the repository to later transmit the edited and formatted Version of Record (VoR) or it will be linked manually. A READ.ME text file will be posted along with any documents and geospatial files. The geographic data ".shp" format files will also have metadata filled out with projection parameters, data description, and links to original source files for base layers.

All data and documents produced by AGEJL-4-Equity encourage redistribution, reproduction and creation of derivatives with a Creative Commons Attribution 4.0 International license or equivalent, and uploaded to Zenodo including:

- 4 spatial data sets will be derived from the publically available Environmental Protection Agency (EPA) Economic Justice Screening (EJScreen) tool data set as attributes linked to existing vector layers for census tracks. These will be made available as comma separated values and .shp files. A single layer file and cvs files that combine the four data sets along with additional analysis from the joint sessions.
- 4 network landscape presentations and a video recording of the webinar session
- Final landscape analysis document will be presented in a webinar that will be recorded. The document and recording of the presentation will be uploaded.
- Guidance on the adapted Communiversity approach and participatory mapping will be used as references during capacity development support. These will be given a unique doi when uploaded.

No software development or more complicated scripting are currently included in the technical approach. Our research team does have the skills to produce scripts to automate some geospatial mapping or analysis tasks. If a request from a community or network does warrant some script development, our research team will inform NASA and post any scripts to a GitHub project page.

The PI will maintain communication as necessary with the data repository and the NASA program manager to ensure that: DMP is updated as needed at time of award; appropriate attribution is included; data meet minimum quality standards; and data are appropriately evaluated for and secured to prevent disclosure of personally identifiable information and to protect proprietary interests, confidentiality, and intellectual property rights.

Section 3.3 AGEJL Schedule

The AGEJL-4-Equity Milestone Schedule outlines the activities, expected deliverables and reporting for each of the six months in the expected life of project. Similar activities are grouped into three phases. In the first phase, EEJ networks are primarily responsible for leading co-creation of the deliverables with ample support from DSCEJ, Tulane and Dr. Padgett. To integrate across and compare EEJ network contexts, the co-creation leadership shifts to a DSCEJ-Tulane hosted workshop with facilitation by Dr. Padgett in phase 2 that takes place in the fourth month. Finally, Dr. Morrow takes ultimate responsibility as the accountable team member for final reporting and deliverables in phase 3 for activities taking place in months 5 & 6.

Milestone Schedule			
	Month	Activity(ies)	Milestone Deliverable
PHASE 1	#1	∗ Kickoff meeting of DSCEJ ∗ EEJ network will complete a self-assessment of capacities ∗ Tulane and DSCEJ will make individualized capacity development support plans **∗ Submit Project and Costing plan**	Each of 4 EEJ networks: • Capacity development (CD) support plans
	#2	∗ EEJ network implement CD plan ∗ EJ community mapping • Environmental justice initiatives, organizations and communities ∗ EEJ networks convene webinar ∗ Supplemental participatory data collection	Each of 4 EEJ networks: • EJ community map • EJ stakeholder priority mapping
	#3	∗ Complete participatory mapping & data collection ∗ Use analysis frame to conduct network-Landscape analysis **∗ Quarterly report**	Each of 4 EEJ networks: • created a network-landscape presentation & map
PHASE 2	#4	∗ Convene EEJ workshop at Tulane University	PI, CO-I, Dr. Padgett: • Report of workshop results • Preliminary statement of EEJ priorities • Integrated map and analysis
PHA	#5	∗ Prepare publication based on participatory mapping Finalize Landscape Analysis	Dr. Padgett, Dr. Morrow: • Online version of participatory map

SE 3			posted
	#6	∗ **Summary and Final Reporting** ∗ Final edit and sharing of Landscape Analysis ∗ Closing of all DMP activities ∗ Closing and reporting on all Inclusion Plan activities	PI-Dr. Morrow: • Final Technical Report • Final Financial Report • Landscape Analysis distribution to partners and NASA

There will be monthly meetings of the PI, CO-I, lead consultant and graduate student to monitor progress towards milestones and take any action to address emerging concerns. The following activities will result in measurable outputs each month:

- Month-1 activities include kickoff meeting and self-assessment with the EEJ networks. The AGEJL-4-Equity team works with each network to plan their participatory data collection and co-analysis that results in a customized capacity development and support plan.
- Month-2 sees EEJ networks implementing plan by mapping EEJ issues, organizations and communities with mixed approaches including key informant and group interviews.
- Month-3 will include hybrid or webinar meetings of EEJ network stakeholders. This will provide the analysis for development of the network-Landscape Analyses
- Month-4 is when Tulane and DSCEJ will co-host the EEJ Workshop. Three to four representatives per EEJ network will contribute to the workshop. A report of the workshop will be produced. Co-analysis and co-mapping will be in draft form.
- Month-5 Dr. Padgett to take lead on Landscape Analysis supported by Dr. Morrow. A draft for rapid comment will be completed at the end of the month.
- Finalization of the Landscape Analysis will be completed in the 6th month. Final reporting and deliver of the Landscape analysis will be submitted before the closing data of the grant. A draft pre-print of an article intended for peer-review will be posted. A common map of EJ communities and priorities will be made available on QGIS cloud and partner websites. All data and materials will be archived on data.nasa.gov and Zenodo.

Ongoing activities will include support requests for Communication, Outreach and Inreach to NASA. Also, frequent communications to EEJ network focal points for any needed support will be handled by Dr. Wright's staff and Ms.TatahMentan and identified for responsive support from Drs. Padgett and Morrow as necessary.

3.4 Inclusion Plan

Tulane University School of Public health and Tropical Medicine (Tulane) and the Deep South Center for Environmental Justice (DSCEJ) have core commitments to Equity, Diversity and Inclusion (EDI) that will support the specific AGEJL-4-Equity EDI goals, action plans and measurement approach.

Tulane's Dean LaVeist has set a goal to be the most diverse public health school in the country. EDI is the focus of a flagship presidential initiative for Tulane called 'Strategy for Tomorrow' that monitors progress towards concrete commitments to EDI. Our project team can rely on an array of support from our EDI office such as providing training on positive and inclusive workplaces.

DSCEJ is a fully independent nonprofit center for collaboration to confront the unique challenges of environmental justice and climate change facing communities of color and poor communities in the South. With roots in New Orleans' historically Black Dillard and Xavier Universities, DSCEJ continues to maintain and grow collaborative relationships with HBCUs in Louisiana and around the country. A major goal of DSCEJ is the development of leaders in communities of color along the Mississippi River Chemical Corridor and the broader Gulf Coast Region that are disproportionately harmed by pollution and vulnerable to climate change.

The first EDI-related goal for AGEJL-4_Equity is to maintain a positive and inclusive work environment. One effective entry point for inclusivity is intentionality in hiring, but the project team is relatively small and diverse. EEJ networks represent a diversity, although primarily African American, of underserved communities all along the Gulf Coast. EJ networks will be encouraged to select focal points and participants in the Landscape Analysis workshop from underrepresented groups in science including women, those from diverse racial or ethnic back ground, sexual orientations, and with different or reduced abilities.

AGEJL-4-Equity actions to create and maintain an inclusive and positive workplace will aspire to consistent modeling of respect, dignity, and civility by each member of the team. The first concrete action is to ensure fairness in access to resources and relative work burden. The AGEJL-4-Equity budget was created with this in design, and we will monitor work effort and resource availability throughout the project to see if there are needed adjustments. The PI, Co-I and lead consultant will complete institutionally available courses or access Tulane's courses (https://hr.tulane.edu/institutional-equity/education-training-programs) on: Creating a positive Workplace; Macroaggressions in the workplace; Unconscious bias; and Workplace diversity, inclusion and sensitivity. AGEJL-4-Equity PI, Co-I and lead consultant will also reiterate the commitment for everyone's voice to be heard, contributions are valued, and are safe to engage at meetings with EJ networks, the larger team or other stakeholders, A standing agenda item

will be included on monthly AGEJL-4-Equity team meetings to reflect on inclusivity and equity during project implementation.

AGEJL-4-Equities second goal focuses on contributing to a more inclusive and diverse scientific workforce. The actions and measures for this goal look to the positive project outcomes primarily for EJ network participants and younger members of the Tulane and DSCEJ support teams. The Communiveristy method, that inspired the design for AGEJL-4-Equity's Technical Approach, was developed to address inequity. Dr. Wright and other early environmental justice researchers realized that achieving environmental sustainability and equity required the coming together of, the traditionally unequal, communities and academic partners in a mutually respectful and beneficial relationship that encourages significant strides toward achieving solutions. This means ensuring community members have an equal voice with university researchers in developing, resourcing, and implementing projects, and are able to benefit from the partnership. This model emphasizes collaborative management of the partnership between a community and a university and encourages capacity development at every opportunity. In this way, communities are more capable of describing environmental issues and advocating for solutions in a scientifically valid way. This approach to engagement has for decades contributed to developing EEJ leaders and a more inclusive science workforce

Engagement with the networks and capacity development for network focal points to implement the Communiversity model will rest on open exchange between equally valued partners in a safe environment that ensures respect, dignity, and civility. Capacity development for the EJ networks will include lessons on inclusivity, micro aggression, unconscious bias and sensitivity to equity when facilitating participatory processes. Differences in ability such as color blindness will be discussed as part of preparation for participatory mapping.

For our stated objectives to be SMART, the following measures will be included in reporting:
Within the 6-months of the training, actions for a positive and inclusive work environment will include:

- 3 or more key personnel complete 3 or more relevant e-learning courses
- 75% of stakeholder meetings begin with a DIE commitment statement
- 6 of 6 monthly meetings include reflection on DIE commitments

6-months of the training, contributions to a diverse and inclusive science workforce:

- 12-20 EJ network focal points and workshop participants engage in capacity development for DIE sensitive facilitation
- 12-20 EJ network focal points and workshop participants develop capacity for equity focused participatory landscape analysis
- 12-20 EJ network focal points acquire knowledge, skills and motivations to lead participatory mapping of EJ communities and their proximities

Section 4.0 Biographical Sketches
PI: Nathan Morrow

1. Professional Preparation

Boston University, Geography, Bachelor of Arts with Honors 1997
Boston University, Geography, Master of Arts 1998
University of Maryland, Geography, Doctor of Philosophy(M. Hansen advisor) 2021

2. Professional Experience and Positions (Appointments)

Co-I, Sahel Collaboration & Communication, USAID-funded, 2020-present
Associate Research Professor, Tulane Law, 2014-2018, Adjunct 2007-2012
Associate Clinical Professor, Tulane School of Social Work, 2012-2014
Associate Clinical Professor, Tulane Public Health & Tropical Medicine, 2011-2014, Adjunct 2007-present

3. Selected Bibliography

Morrow, N., Mock, N. B., Gatto, A., LeMense, J., & Hudson, M. (2022). Protective Pathways: Connecting Environmental and Human Security at Local and Landscape Level with NLP and Geospatial Analysis of a Novel Database of 1500 Project Evaluations. *Land*, *11*(1), 123. https://doi.org/10.3390/land11010123

Morrow, N. (2022). *People-centered design in Open Sourced Science for enhanced use of Earth observation in equitable engagement, empowerment for collective action, and meaningful measurable impact.* Open Sourced Science (OSS) for Earth System Observatory (ESO) Mission Science Data Processing Study. **https://doi.org/10.5281/zenodo.5932699**

Mock, N., **Morrow, N.**, & Papendieck, A. (2012). From complexity to food security decision-support: Novel methods of assessment and their role in enhancing the timeliness and relevance of food and nutrition security information. *Global Food Security*, *2*(1), 41–49. https://doi.org/10.1016/j.gfs.2012.11.007

Muchoney, D., Borak, J., Chi, H., Friedl, M., Gopal, S., Hodges, J., **Morrow, N.**, & Strahler, A. (2000). Application of the MODIS global supervised classification model to vegetation and land cover mapping of Central America. *International Journal of Remote Sensing*, *21*(6–7), 1115–1138. https://doi.org/10.1080/014311600210100

Morrow, N., & Prince, S. (1999). Use of potential and actual primary production models to map drought and degradation in semi-arid Southern Africa. *EOS Transactions, 80*(46), F403.

Morrow, N., & Friedl, M. (1998). Modeling biophysical controls on land surface

temperature and reflectance in grasslands. *Agricultural and Forest Meteorology*, *92*(3), 147–161. https://doi.org/10.1016/S0168-1923(98)00098-7

4. Research Experience: Scientific, Technical, Management

Dr. Morrow has acquired a wide range of skills and expertise with 25 years of experience leading implementation, developing capacity and ensuring research-based evidence for multi-sectoral food security, humanitarian response, and child wellbeing policy implementation projects. He has served as Chief of Party for a multi-organizational consortium for multi-country developmental relief and humanitarian aid response valued at over 400 million USD responding to an El Niño drought food security crisis in southern Africa. The response developed systems and approaches that served as a precursor to now ubiquitous resilience policy-focused programming. As co-chair of the Emergency and Disaster Evaluation thematic group at the American Evaluation Association, Dr. Morrow has promoted inclusive engagement and more rigorous measurement models in resilience research and intervention planning. The most recent Global Environment Facility (GEF-7) replenishment strategy was informed, in part, by a geospatial analysis of armed conflict and environmental security led by Dr. Morrow.

Dr. Morrow has also recently worked on a user needs-based capacity development strategy, including Landscape Analysis, for the global resilience and emergency response work of the Food and Agriculture Organization of the United Nations. As Landscape Analysis is a core element of organizational strategy processes, Dr. Morrow has taught Landscape Analysis in his foundational Design and Implementation of Global Health Projects course that is now a school-wide requirement. He introduced Landscape Analysis as a systems assessment approach in other courses focused at system strengthening and addressing structural inequality. Strategic assessment and strategy processes to strengthen evidence-based decision support have been a feature of Dr. Morrow's research and consulting with a variety of organizations including work on USAID's resilience measurement operational research in the Horn of Africa, needs assessment capacity for the United Nation's World Food Programme, and the global redesign of World Vision International's system for reporting to the International Board and other stakeholders on impact for improved child wellbeing. Dr. Morrow was invited to conduct the first-ever technical review of an SDG target indicator; 2.1.2 -- Prevalence of severe or moderate food insecurity.

Dr. continues to actively use remote sensing and geospatial analysis in his applied research following on early contributions to the MODIS, NPOESS, and Land-Use and Land-Cover Change science mission. These technologies featured in Developmental Evaluations of the World Food Program's mVAM program for improved needs assessment and hazard monitoring. They also feature in his teaching that includes problem sets related to assessing flood damage or humanitarian logistics planning.

Co-I:Institutional PI: Dr. Beverly Wright

1. Professional Preparation

Grambling State University, Sociology, Bachelor of Arts 1969
State University of New York at Buffalo, Sociology, Master of Arts 1971
State University of New York at Buffalo, Sociology, Doctor of Philosophy 1977

1. Professional Experience and Positions (Appointments)

Executive Director, Deep South Center for Environmental Justice, 2005-present
Professor of Sociology , Dillard University, 2005-2017,
Professor of Sociology, Xavier University of Louisiana, 1992-2005
Associate Professor, Wake Forest University, 1989-1993

2. Selected Bibliography

Wright, B.H., (2015) Environmental Injustice and the State of Black New Orleans," pp. 100 - 113 in McConduit-Diggs, Erika, State of Black New Orleans: 10 Years Post-Katrina. New Orleans: The Urban League of Greater New Or-leans.

Wright, B.H.,, and Nance, E., (2012). "Toward Equity: Prioritizing Vulnerable Communities in Climate Change," Duke Forum for Law and Social Change, 4 (1), 1-21.

Wright, B.H., (2011). "Race, Place, and the Environment in the Aftermath of Katrina," Anthropology of Work Review, American Anthropological Associa-tion, 32 (1), 4-8.

Bullard, Robert D. & **Wright**, **B.H.,** "Disastrous Response to Natural and Man-Made Disasters: An Environmental Justice Analysis Twenty-Five Years after Warren County," UCLA Journal of Law and Environmental Policy 26: 2008.

Wright, B.H., (1998). "Endangered Communities: The Struggle for Environmental Justice in Louisiana's Chemical Corridor," Journal of Public Management and Social Policy, 4(2), 181-191.

Wright, B.H., Bullard, R.D., & Johnson, G.S., (1997). "Confronting Environmental Injustice," [Special Issue]. Journal of Race, Gender, and Class, 5, 65-79.

Bullard, R. D. & **Wright, B.H**., (1993). "Environmental Justice for All: Community Perspectives on Health and Research Needs," Toxicology and Industrial Health, 9(5), 821-841.

Wright, B.H., & Bullard, R.D., (1990). "Hazards in the Workplace and Black Health: A Review," Journal of Sociology, 4(1), 45-74.

3. **Research Experience: Scientific, Technical, Management**

In 1992, Dr. Wright founded the Deep South Center for Environmental Justice at Xavier University in New Orleans (later moved to Dillard University in 2005) modeled on Communiversity Model approach. As the founding director of the first university based environmental justice organizations, Dr. Wright has been at the forefront of the movement to empower and build resiliency in low-income and people of color who are threatened by natural and manmade disaster, hazards, and emergencies. Dr. Wright worked collaboratively with some of the nation's leading environmental justice and health equity scholars on communities disproportionately impacted by industrial pollution, environmental hazards, and natural and manmade disasters in the Louisiana Chemical Corridor, also known as "Cancer Alley." Dr. Wright have served as PI or coinvestigator on dozens of research projects that address emergency management, response, and resiliency of workers and residents impacted by nearby or "fence line" refineries and petrochemical plants, Superfund sites, hurricanes, floods, and industrial accidents and spills – managing grants of over 23,000,000 USD. DSCEJ addresses environmental and health inequities along the Mississippi River Chemical Corridor and is a community/university partnership providing education, training, and job placement. Since Hurricane Katrina, much of her work at the Center has focused on research, policy and community outreach as well as assistance and education of displaced African-American residents of New Orleans. After EPA identified more than 200 sites around the city with elevated lead and arsenic levels, I forged a unique partnership with the U.S. Steelworkers to launch "A Safe Way Back Home Project," a proactive pilot neighborhood cleanup project. Using our NIEHS-funded Minority Worker Training Program model, the neighborhood-centered pilot cleanup project trained more than 60 small businesses and contractors in hazardous waste removal, mold remediation and health and safety methods, and trained hundreds of volunteers from around the country to assist community residents in the cleanup and return safely to their devastated New Orleans homes and neighborhoods. Over these last thirty years working in the field of environmental justice, health disparities and community sustainability. Her research experience has shown that federal, state and local policies can have a long lasting and sometimes devastating impact on communities. Dr. Wright recognizes the importance of educating communities on the science related to issues of health and that engaging them with policymakers empowers communities to advocate on their own behalf to push government to make policy changes that better protect the public health. Dr. Wright is currently a member of the White House Environmental Justice Advisory Council (WHEJAC) and she serves on the Justice 40 committee.

Senior Consultant: David Padgett

1. **Professional Preparation**

Western Kentucky University, Geography/Geology, Bachelor of Science 1987
University of Florida, Geography/Environmental Engineering, Master of Science 1992
University of Florida, Geography/Geology, Doctor of Philosophy 2001

2. Professional Experience and Positions (Appointments)

Associate Professor of Geography, Tennessee State University, 2005-present
Visiting Assistant Professor, Vanderbilt University 2012-2013,
Assistant Professor of Geography, Tennessee State University 1999-2005
Visiting Assistant Professor of Environmental Studies, Oberlin College 1996-1999

3. Selected Bibliography

Padgett, D.A., Solis, P., Adams, J.K., Duram, L.A., Hume, S., Kuslikis, A., Lawson, V., Miyares, I.M., and Ramirez, A. "Diverse Experiences in Diversity at the Geography Department Scale," The Professional Geographer online edition, January (2013).

Padgett, D.A., Marsh, E., Harper, J., and Robinson, C. "Green Careers Curriculum Manual: Improving Access to Green Careers through Environmental Science and En-gineering at Historically Black Colleges and Universities," U.S. Environmental Protec-tion Agency (EPA 904-B-12-001), January (2012).

"Teaching Race, Class, and Cultural Issues in Earth Science to Enhance Multicultural Education Initiatives," Journal of Geoscience Education, vol. 49, no. 4, (2001), pp. 364-369.

4. **Research Experience: Scientific, Technical, Management**

Dr. David Padgett is a geoscientist by training with more than 30-years of experiences of in community engaged action research. He has worked in academia and as a consultant on projects including Community Air Quality Sensor Training and Community Air Quality Mapping, Community Asset Mapping, and WeGlobal Research Project on African Americans Living Abroad. Through his research and experience he has the appropriate expertise to co-develop participatory mapping tools. He has also mentored generations of graduate students at Tennessee State University throughout their academic journey. Given his expertise and skillset he is a highly-valued member of the team for ensuring quality deliverables from this project.

Graduate Student: Tatah Mentan Kefeyin Mom

1. **Professional Preparation**

University of Minnesota-TwinCities, Bachelor of Arts 2013
Dornsife School of Public Health, Drexel University, MPH 2016
Tulane University, School of Public Health and Tropical Medicine, Doctor of Philosophy expected (2023)

2. **Professional Experience and Positions (Appointments)**

ARMHR Research Fellow, Office of Global Health, Tulane University, 2021
Research Assistant, Environmental Health Sciences, Tulane University, 2019-Present
Research Assistant, Check It, Department of Epidemiology, Tulane, 2019-2021

3. **Selected Bibliography**

Craig-Kuhn, M.C., Schmidt, N., Scott Jr, G., Gomes, G., **TatahMentan, M**., Enaholo, O., Guzman, S., Tannis, A., Hall, J., Triggs, D.R. and Kissinger, P.J., 2021. Changes in sexual behavior related to the COVID-19 stay-at-home orders among young Black men who have sex with women in New Orleans, LA. Sexually Transmitted Diseases, 48(8), pp.589-594.

TatahMentan, M., Nyachoti, S., Scott, L., Phan, N., Okwori, F.O., Felemban, N. and Godebo, T.R., 2020. Toxic and Essential Elements in Rice and Other Grains from the United States and Other Countries. *International Journal of Environmental Research and Public Health*, *17*(21), p.8128.

Momplaisir, F.M., Aaron, E., Bossert, L., Anderson, E., **Tatahmentan, M.,** Okafor, V., Kemembin, A., Geller, P., Jemmott, J. and Brady, K.A., 2018. HIV care continuum outcomes of pregnant women living with HIV with and without depression. *AIDS care*, *30*(12), pp.1580-15854. Research Experience: Scientific, Technical, Management

4. **Research Experience: Scientific, Technical, Management**

As a qualitative researcher at the Children's Hospital of Philadelphia, Ms. TatahMentan coded and analyzed data focused on treatment for ADHD in low-income children. She has performed chart abstractions and assisted in manuscript writing on a project focused on HIV continuum of care for women experiencing perinatal depression. She coordinated the data collection including survey administration, focus group and key informant interviews for two separate WASH projects in Rwanda. In the Check It program a Chlamydia and Gonorrhea study, she recruited study participants, the creation and dissemination of health communication materials. She is a lab assistant for over two years processing samples, perform acid digestion and prepare samples to undergo inductively coupled plasma mass spectrometry analysis

Section 5. Summary of work effort

.

Name	Title	NASA Level of Effort	OTHER LOE (or not known eg. consultant)	Planned Focus	Period of Work
Nathan Morrow	Principal Investigator	30%	70%	Lead research and accountable for project management and deliverables	Life of Project
Mom Tahta-Mentan	Graduate Student	30-50%	70-50%	Support research	Life of Project
Beverly Wright	Co- Investigator: Institutional PI	<10%	>90%	Co-lead research and manage support to EJ networks. Network support assitance by DSCEJ administrative staff.	Life of Project

Section 6. Current and Pending Support

NAME OF INVESTIGATOR: Nathan Morrow

Status of Support: _x__Current ___Pending ___Submission Planned in Near Future

Project/Proposal Title: Sahel Collaboration and Communication

Source of Support: USAID

Award Amount (or Annual Rate): $_1,450,000_____ Period Covered:_Sept 2020-Aug 2025_____

Location of Activity: Niger and Burkina Faso

Person-Months or % of Effort Committed to the Project: __50%_calendar____Cal Yr _____Acad _____Summ

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Status of Support: ___Current _X__Pending ___Submission Planned in Near Future

Project/Proposal Title: Assessing NASA Open Science Outlook for Environmental Justice and Resilience of the Louisiana Gulf Coast (OSO-LoGiC)

Source of Support: NASA EPS-CoR

Award Amount (or Annual Rate): $____65,000_____ Period Covered:__April 2022 – March 2023_____

Location of Activity:

Person-Months or % of Effort Committed to the Project: ___15%__Cal Yr _____Acad _____Summ

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Status of Support: ___Current ___Pending _X__Submission Planned in Near Future

Project/Proposal Title: Diagnosing The Health of Amazonian Wetlands with Multisensor Satellite Data

Source of Support: NASA Applied Science –A.35 SERVIR Applied Science Team

Award Amount (or Annual Rate): $_____200,000_____ Period Covered:____Jan 2023-Dec 2026_____

Location of Activity:

Person-Months or % of Effort Committed to the Project: ___15%__Cal Yr _____Acad _____Summ

Section 7. Statements of Commitment and Letters of Support

NBEJN
NATIONAL BLACK ENVIRONMENTAL JUSTICE NETWORK

9801 Lake Forest Blvd.
New Orleans, LA 70127
(504) 272-0956

Dr. Nathan Morrow
Tulane University School of Public Health and Tropical Medicine
1440 Canal St, Suite 2200
New Orleans, Louisiana, 70112

Dear Dr. Morrow,

It is with pleasure that I provide this letter of support for your proposal entitled “Assessment of the Gulf Coast Environmental Justice Landscape for Equity”. As the Network Coordinator of the National Black Environmental Justice Network, I have experience engaging communities on issues related to environmental justice. After review of your proposal, I believe this is an opportune time to conduct this landscape analysis. Specifically, because of the vast array of environmental health inequities that are affecting the gulf coast. The mission of National Black Environmental Justice is centered on addressing these inequities and advocating for environmental justice with data and anecdotal experiences denoted by communities we serve. I firmly believe that this landscape analysis will be a starting point to jumpstart the use and integration of community engaged methodologies and environmental health data to improve the quality of life of our constituents.

We acknowledge that we.are identified by name as Collaborators to the investigation, entitled "AGEJL-4-Equity", that is submitted by Dr. Nathan Morrow to the NASA funding announcement NNH21ZDA001N-EEJ -- A.49 Equity and Environmental Justice, and that we intend to carry out all responsibilities identified for me us in this proposal. We understand that the extent and justification of our participation, as stated in this proposal, will be considered during peer review in determining in part the merits of this proposal. We have read the entire proposal, including the management plan and budget, and we agree that the proposal correctly describes our)commitment to the proposed investigation. To conduct work for this investigation, my participating organization is the National Black Environmental Justice Network.

I am thrilled at the prospect of this work and am happy to endorse and give this my full support. If there is any additional information you need from me, please do not hesitate to ask and I’d be happy to assist as best as I can,

Cordially,

Asti Davis, JD
Network Coordinator
National Black Environmental Justice Network

March 14, 2022

Dr. Nathan Morrow
Tulane University School of Public Health and Tropical Medicine
1440 Canal St, Suite 2200
New Orleans, Louisiana, 70112

Dear Dr. Morrow,

We are pleased to provide this letter of support for your proposal entitled “Assessment of the Gulf Coast Environmental Justice Landscape for Equity”. As co-directors of the Historically Black College and University (HBCU)-Community Based Organization (CBO) Gulf Coast Equity Consortium, we have experience engaging communities on issues related to environmental and climate justice. The goal of the Consortium is to improve the health and lives of children and families in the Gulf Coast Region. We believe this is the perfect time to conduct a landscape analysis because of the various environmental health inequities existing in the region. The landscape analysis will be a starting point to use and integrate community engaged methodologies and environmental health data to improve the quality of life of Gulf Coast constituents.

"We acknowledge that we are identified by name as a Collaborator for the proposed project, entitled "AGEJL-4-Equity", that is submitted by Dr. Nathan Morrow to the NASA funding announcement NNH21ZDA001N-EEJ -- A.49 Equity and Environmental Justice, and that we intend to carry out all responsibilities identified for me in this proposal. We also understand that the extent and justification of my participation, as stated in this proposal, will be considered during peer review in determining in part the merits of this proposal. We have read the entire proposal, including the management plan and budget, and agree that the proposal correctly describes the commitment of the Consortium to the proposed investigation.” To conduct work for this investigation, our participating organization is the HBCU-CBO Gulf Coast Equity Consortium.

We are happy to endorse and give this work our full support. If there is any additional information you need from us, please do not hesitate to ask and we will be happy to assist.

Cordially,

Beverly Wright, Ph.D.
Co-Director

Robert Bullard, Ph.D.
Co-Director

DEEPSOUTH CENTER FOR ENVIRONMENTAL JUSTICE

9801 Lake Forest, Blvd
New Orleans, LA 70127
(504) 272-0956
www.dscej.org

March 15, 2022

Dr. Nathan Morrow
Tulane University School of Public Health and Tropical Medicine
1440 Canal St, Suite 2200
New Orleans, Louisiana, 70112

Dear Dr. Morrow,

It is with pleasure that I provide this letter of support for your proposal entitled “Assessment of the Gulf Coast Environmental Justice Landscape for Equity.” As the Executive Director of the Deep South Center for Environmental Justice (DSCEJ), I have experience engaging communities on issues related to environmental justice. After review of your proposal, I believe this is an opportune time to conduct this landscape analysis. Specifically, because of the vast array of environmental health inequities that are affecting the gulf coast. The mission of the DSCEJ is dedicated to improving the lives of children and families harmed by pollution and vulnerable to climate change in the Gulf Coast Region through research, education, community, and student engagement. I firmly believe that this landscape analysis will be a starting point to jumpstart the use and integration of community engaged methodologies and environmental health data to improve the quality of life of our constituents.

“I acknowledge that I am identified by name as Collaborator to the investigation, entitled "AGEJL-4-Equity", that is submitted by Dr. Nathan Morrow to the NASA funding announcement NNH21ZDA001N-EEJ -- A.49 Equity and Environmental Justice, and that I intend to carry out all responsibilities identified for me in this proposal. I understand that the extent and justification of my participation, as stated in this proposal, will be considered during peer review in determining in part the merits of this proposal. I have read the entire proposal, including the management plan and budget, and I agree that the proposal correctly describes my commitment to the proposed investigation.” To conduct work for this investigation, my participating organization is the DSCEJ Community Advisory Board.

I am thrilled at the prospect of this work and am happy to endorse and give this my full support. If there is any additional information you need from me, please do not hesitate to ask and I’d be happy to assist as best as I can.

Sincerely,

Beverly Wright, Ph.D.
Executive Director

March 15, 2022

Dr. Nathan Morrow
Tulane University School of Public Health and Tropical Medicine
1440 Canal St, Suite 2200
New Orleans, LA 70112

Dear Dr. Morrow:

I am writing with a letter of support for your proposal entitled *Assessment of the Gulf Coast Environmental Justice Landscape for Equity*.

The Environmental Justice Forum – a network of more than 55 environmental justice groups representing 22 states including several based in the Gulf Coast region. I serve as Senior Director of Strategy and Federal Policy and serve as lead for the EJ Forum and, after review of your proposal, believe this is the opportune time to conduct this landscape analysis that examines the vast array of environmental health inequities that are affecting the gulf coast. I firmly believe that this landscape analysis will be a starting point to jumpstart the use and integration of community engaged methodologies and environmental health data to improve the quality of life of constituents.

I acknowledge that I am identified by name as Collaborator to the investigation, entitled "AGEJL-4-Equity", that is submitted by Dr. Nathan Morrow to the NASA funding announcement NNH21ZDA001N-EEJ -- A.49 Equity and Environmental Justice. I understand that the extent and justification of my participation, as stated in the proposal, will be considered during peer review in determining in part the merits of this proposal. I agree that the proposal correctly describes my commitment to the proposed investigation." To conduct work for this investigation, my participating network is the Environmental Justice Leadership Forum.

I am happy to endorse and give this my full support. If there is any additional information you need from me, please do not hesitate to ask and I'd be happy to assist as best as I can.

Sincerely,

Dana Johnson

Dana Johnson

Section 8. Budget Justification:

Key Personnel:

Tulane personnel will be leading the project from start to finish over the proposed period of 6 months.

Nathan Morrow, The Principal Investigator will contribute a level of effort 30%, is accountable for achievement of science objectives and quality of research. This will be achieved through exemplary project management. As PI, Nathan is accountable for maintenance of resource control environment, meeting all award milestones and reporting requirements, grant administration, and regular communication with stakeholders and deliverables. He is NASA's primary contact point. He will ensure clear communication between all project partners and stakeholders. He will provide overall supervision as well as strategic and technical direction of activities. He will dedicate a minimum of 2-full month equivalent of time over life of project and will be paid 30% of his effort for the life of the project. He is responsible for implementing the overall data management plan and monitoring the inclusion plan.

Additional Personnel:

Mom Kefeyin TatahMentan, Graduate Student, level of effort 30-50%. will manage support on background evidence scan and support networks with self-assessment and capacity building. She will liaise with Drs. Morrow, Wright and Padgett to provide additional capacity support to networks as needed in completing their network-landscape presentations. She will assist in managing the workshop, ensuring information is handled as per DMP, and fully collaborate on analysis and reporting activities

Staff, Program Manager, will contribute a level of effort 5 % , is responsible to facilitate project logistics, supporting project activities, and contributing to project reporting. (fully cost shared)

Fringe Benefits:

Fringe Benefits are charged as direct costs and are set by Tulane at the current negotiated rates for budgeting purposes. FY22 rates: Faculty: XX%, Students: XX%, Staff: XX%.

Consultants:

Dr. David Padgett, will contribute a level of effort 20-days: Dr. Padgett is a professor at Tennessee State University and established NASA investigator will be hired as a consultant for 20 days to provide expert participatory and dynamic mapping and facilitate community engagement. The consultant rate was determined by the field competi-

tion and an average rate was derived. The total cost for consultancy is provided in the NSPIRES cover page and does not include any other costs than Dr. Padgett's time.

Equipment:

Total Requested for Equipment Support: $0

Travel: $1,500. Dr. Padgett will travel to facilitate workshop meetings in New Orleans in October 2022.

Airfare	$400
Lodging	$750
Meals & Incidentals	$250
Taxis to/from airport	$100
Total Costs	**$1,500**

Facilities and Equipment:

Training and Workshops: Tulane will provide space and facilities for project workshops at no cost to the project.

Total Requested for Equipment Support: $0

Sub-Contract:

Deep South Center for Environmental Justice was selected as a Subcontract candidate due to the expert work in integrating participatory methods in environmental justice work. They were also selected for their reputation for agile high quality community collaboration. DSCEJ will facilitate direct support for four community networks and will dedicate experienced personnel to the project's Communiversity-modeled activities. Dr. Beverly Wright, CO-I and Institutional PI supported by DSCEJ staff, is accountable for the fidelity of the proposed activities and deliverables to the principles of Communiversity and will contribute directly to workshop design and engagement with networks. Dr. Wright will be co-lead author of the final Landscape Analysis.

The sub-award will be spent on travel for 3-5 participants from each network travel to the Landscape Analysis workshop. A small honorarium may also be paid to networks for hosting webinars and undertaking AGEJL-4-Equity activities to prepare presentations for the workshop. Based on the principles of equity, each network will receive an equal amount for travel and honorarium. If travel savings are realized, networks will fund more than the minimum of 3 participants to attend the workshop. Agile collaboration is necessary for frontline community organizations to make the most of limited resources.

DSCEJ has extensive experience with funding EEJ work to be done by the most concerned communities and networks. The first step of this process is to negotiate for most

effective and efficient approach to meeting objectives and then co-create a documented set of commitments with time bound deliverables from each network partner. In fact, working together on resource management is part of the capacity development Communiversity model. Network participants are invited to attend the 2-day Landscape Analysis workshop and also to attend the 2-day Open Science for Environmental Justice conference directly preceding. Overnight accommodation in New Orleans using Tulane University negotiated rate is $150 per night. If each network invites 3 participants for 4 nights, the total is $1800. Meal allowance of $50 per day for 3 participants is $600. A travel allowance for airfare, train or car travel estimated at $350 for 4 participants is $1400. Each network will have a travel budget of $3800. Honorariums for the networks of $1200 for each network to engage in webinars, AGEJL-4-Equity activities and for any costs to prepare network landscape analysis presentations. The total budget passed on to networks is $5000.

Dr. Wright and DSCEJ are fully committed to making as much of the funding as possible directly available to the EEJ networks. This means for them to be as agile and lean in their project management as possible by leveraging volunteer time and shifting tasks among the Center's staff to bolster Dr. Wright and the leadership team's efforts. In that way, Dr. Wright's LOE remains low while she is flexible and available to make contributions at the most critical times. It is a matter of efficiency and value for money. DSCEJ will receive $2000 in other funds to reimburse any costs of supporting networks and distributing travel and honorarium fees.

$2400 will be spent from sub-contract on open access publishing fees.

As necessary for the Costing Plan task in the first month of the award, more detailed costs disaggregated by network or individual will be articulated. Specific hotel and travel reservations, that represent the bulk of the network resource requirements, could potentially be made at that time to provide highly detailed cost estimates to be communicated as necessary to the program officer. Working with NASA on models to engage EJ community organizations is encouraged in the NOFO, and AGEJL-4-Equity looks forward to exploring the best possible approaches to include budgeting and costing in these engagement models.

Total Requested for Sub-Contracts: $26,400

Section 9. Detailed Budget

*As per ROSES guidance, all cost for people including salary, benefits, overhead or totals have been removed.

AGEJL - Detailed budget

	NASA Funds requested			Institutional Contribution		
Tulane	Amount	Unit	Total	Amount	Unit	Total
Direct Labor:						
PI reseracher (30% LOE)	XX	6 Months	XX	XX	6 Months	XX
Graduate assistants	XX	6 Months	XX			
Staff (5% LOE)				XX	6 Months	XX
Fringe rates:						
Faculty - XX%			XX			XX
Student - XX%			XX			
Staff - XX%						XX
Salary and Fringe subtotal			XX			XX
Equipment:						
Supplies:						
Travel:			1,500.00			
Tuition:						
Other:						
Dr. Padgett (consultant)		20 days	XX			
Subtotal - Direct			XX			XX
Subawards: **DSCEJ**						
4 awards, passed on to networks			24,000.00			
journal article processing fee			2,400.00			
Subtotal- Subaward			XX			
Indirect Costs:						
Direct cost (52%)			XX			XX
Subaward (Applied to first 25k)			XX			
Cost Sharing:						20,085.89
Total Costs:			XX			

DSCEJ sub-award budget - Detailed

	NASA Funds requested		
DSCEJ	Amount	Unit	Total
Direct Labor:			
Co-I: Institutional PI	XX	6 Months	XX
Support Staff	XX	6 Months	XX
Fringe rates:			
Salary and Fringe subtotal			XX
Equipment:			
Supplies:			
Travel:	5,000.00	4	20,000.00
Tuition:			
Other:			
journal article processing fee	2,400.00	1	2,400.00
distributing funds & travel to networks	2,000.00	1	2,000.00
Subtotal - Direct			XX
Indirect Costs:			
			XX
			XX
Total Costs:			XX

Section 10. Facilities and Equipment:

Tulane will provide facilities for workshops and meetings at no direct cost to the project. Facilities include the state-of-the-art research, education and outreach amenities of the River and Coastal Center offered by the ByWater Institute at Tulane. The TRCC opened in 2016 and features laboratories, offices, and a public meeting space with views of the Mississippi River. The building is managed by the ByWater Institute, but scholars can use the meeting space for programming relevant to the TRCC mission. The Tulane River and Coastal Center is available for exhibitions, classes, demonstrations, shows, receptions, meetings, and/or conferences that relate to the mission of the ByWater Institute. The Forum is 1400 square feet with flexible seating and views of the Mississippi River. The Selley Foundation Room is 200 square feet with fixed conference seating and views of the river