

The Critical Need for a Stable and Supported Program on Endangered Language Documentation  
at the National Science Foundation

A Position Paper from the Research and Tribal Communities  
Submitted by the DLI-DEL Scholar and Community Member Collective

"...It behooves us as scientists and as human beings to work responsibly both for the future of our science and for the future of our languages, not so much for reward according to the fashion of the day, but for the sake of posterity. What we need to do now stares us in the face. If we do not act, we should be cursed by future generations for Neronically fiddling while Rome burned."

Michael Krauss (1992)

## Summary and Statement of Need

It is the official policy of the United States government to preserve, protect, and promote the rights and freedom of Native Americans to use, practice, and develop native languages. Currently there are over 500 tribes in the United States and their languages are, in most cases, in critical condition. Since 2003, NSF, through its Documenting Endangered Languages (DEL) Program, has played a crucial role in the realization of this federal policy. During this period, DEL has supported projects to advance scientific research and education, not only the field of Linguistics but also in other fields, such as Anthropology, Social Psychology, Education, Arctic Studies, and Cognitive Sciences. These advances have been made in theory; in education and participant training; in archival preservation infrastructure and standards; in knowledge dissemination and tool development; and in research community-building and language revitalization. The DEL program was uniquely positioned within federal funding agencies to provide funding and resources for research projects that have strong intellectual merit and broader impacts. However, the recent repositioning of programs within the Directorate of Social, Behavioral and Economic Sciences at the NSF has resulted in the absorption of DEL within Linguistics, renamed as [\*NSF Dynamic Language Infrastructure-NEH Documenting Endangered Languages \(DLI-DEL\)\*](#), along with the loss of DEL's dedicated program officer. This move is at odds with the strategic plan of the NSF, which urges ["support \(for\) outstanding researchers and innovative thinkers from across our Nation's diversity of regions, types of organizations, and demographic groups."](#)

This change in staffing is cause for serious concern. The needs of the DLI-DEL community of researchers and STEM educators differ from those of more traditional fields of science; although DEL has not been a large NSF program, its outreach efforts (and benefits from these) have been substantial. In 2019, the Division of Behavioral and Cognitive Sciences' Committee of Visitors acknowledged, in their report to NSF, that they were "concerned about the effects of these changes [the merger of DEL and Linguistics and the loss of a PO position] on DEL's mission, since much of the work supported by DEL is not just a subset of linguistics, but instead is strongly grounded in anthropology." We too are concerned that the essential community-building functions engaged in previously by dedicated DEL PO's will cease, to negative impact.

We are in addition concerned about the effects on the Linguistics program, whose two POs must fill the gap to manage DEL proposals as well. This is a large increase in workload, beyond what would be estimated from sheer number of proposals. Documenting endangered languages requires a PO who can work with an unusually diverse population of PIs, institutions, and levels of

infrastructure, requiring specialized expertise and community connections that the typical theoretical/experimental Linguistics PO is unlikely to have.

Linguists who study the science of endangered languages have been at the forefront of collaboration with indigenous tribes ever since shortly after colonists settled on their lands in the United States. Information about the structures, meanings, changes over time, and conventions of use of native languages is critical to the health and well-being of tribal communities. Many Native American, Alaska Native, and Native Hawaiian communities see language documentation and revitalization as one of their top priorities. In fact, having tribal citizens who are both linguists and engaged community language practitioners is crucial, and presents opportunities to engage underrepresented communities in citizen science projects for data collection and analysis. As citizens, taxpayers and sovereign entities, Native Americans deserve to know that scientists study and value their languages, and they deserve opportunities to participate in their documentation.

This paper next considers the history of DLI-DEL, and highlights its contributions to Intellectual Merit and Broadening Participation, and then outlines recommendations for its continuation and growth. The signers listed with the Executive Summary and this Position Paper comprise stakeholders who are invested in the science of endangered languages and the continuation of DLI-DEL; they include principal investigators, language scientists, language activists, community collaborators, educators, tribal leaders, and students.

The loss of minority languages, not just in the U.S. but worldwide, remains one of the most serious threats to humanity's heritage of knowledge, history, social behavior, and the workings of the human mind. We urge NSF to maintain the strong bridge created by DLI-DEL between scientific research and Native American and other indigenous communities into the future and to dedicate a fulltime PO to that program. This course of action is of paramount importance to the disciplines of linguistics, anthropology, and indigenous studies, and to the wellbeing of native communities in the U.S. and throughout the world.

### **Background: The Science of Endangered Languages and the Origins of DLI-DEL**

Toward the end of the 20th century, scholars gave voice to the growing crisis of language endangerment and death at a global scale. Linguists like Ken Hale (who organized the first plenary on the subject at the 1991 Linguistic Society of America annual meeting and edited part of a larger issue of *Language* on those talks, Leanne Hinton (1998), Michael Krauss (1992), Salikoko Mufwene (2002), Lyle Campbell (1994), Nancy Dorian (ed., 1989), Joshua Fishman (1991), and David Crystal (2000) argued that the world's languages face a very real threat of "mass extinction" (Krauss 2007: 4). They highlighted the potential loss of information and insight on our collective human cognitive capacity, as well as the profound cultural and historical loss posed by this worldwide threat.

U.S. federal funding agency directors took note of this large-scale endangerment and discovered an alarming lack of materials, archival facilities, and financial support for research, education, and documentation activities. They acknowledged an urgent need to facilitate the preservation of the amazing linguistic diversity found across the United States, and globally. This need was described as a set of interlocking problems: (1) The problem of endangerment as a reduction in the

opportunities and environments in which languages may be practiced; (2) The problem of language extinction as an interruption in intergenerational transmission, leading to language death; and (3) The problem of language erasure, or the vanishing of knowledge that results from large-scale language loss. DEL co-founder [Anna Kerttula, former Program Director of the NSF Arctic Social Science Program](#), likewise located language as the locus of concern. She recommended that projects should do the following: focus on endangered languages in wider ranges of practice, crossing genres and domains; represent diversity in communities of practice; contribute to advances in archival storage and access; and facilitate deeper and more consequential discipline-specific investigations, including in anthropology, biology, computer science, and cognitive science, to name just four disciplines.

From its very inception, the NSF DEL Program supported the creation of a new scientific sub-discipline (much in the way the discipline of ecology developed in the early 20<sup>th</sup> century). DEL is a developing field of science that, like ecology, recognizes an interconnected and rapidly changing natural and social world. Failure to capture a holistic scientific understanding of the connections between rapidly disappearing languages and the evolving natural and social world order in which these languages developed will leave humanity without a full toolbox with which to tackle the challenges of the future. The first DEL-funded grants were announced in 2005. Since then, DEL has funded over 300 projects, of which over 60% were research projects that included fellowships and doctoral dissertations, Early Career Development awards, EAGER awards (Early Concept Grants for Exploratory Research), RAPID (Rapid Response) grants, and one REU site. Other awards included those for capacity-building, supported institutes and conferences (InField/CoLang, Breath of Life, Conference on Political Instability and Language Endangerment, Minority Language Documentation for Community Practitioners, and the International Conference on Language Documentation and Conservation); and, workshops (including Methods in Phonological Data Collection and Analysis, Electronic Metastructure for Endangered Language Data (EMELD), Developing Collection Management Tools, Sociolectal & Dialectal Prosodic Variation, Computational Methods for Endangered Languages (ComputEL), Documenting Multilingualism, North American Indigenous Learning, Indigenous Perspectives Relevant to Wellness, Assessing & Documenting the Vitality of Native American Languages, and Natives4Linguistics/Broadening Native American Participation).

Over time, DEL funding for the science of endangered languages has branched out to include cross-disciplinary collaboration and outputs that benefit language revitalization and teaching, as well as within-language-community collaboration and capacity building. These activities have resulted in publications, tools, and infrastructure that have substantially advanced knowledge within language documentation itself, and in connected fields of linguistics, speech/data processing, cultural anthropology, archaeology, ethnobotany, geography, and information sciences. They have contributed to significant advances in archival infrastructure and to new technologies for documentation and linguistic analyses. DEL also has involved substantial undergraduate education and training in language documentation by funding a Research Experiences for Undergraduates (REU) site (BCS 1461056 "Building Digital Tools to Support Endangered Languages and Preserve Environmental Knowledge in Mexico, Micronesia, and Navajo Nation"), which brought undergraduate students into advanced, cutting-edge documentation-as-research settings. They have also actively involved undergraduate students in informal learning and training through REU stipends of existing grants (e.g. the REU titled "Giving

cultural and social meaning to disaster: Himalayan highlander responses to the 2015 earthquakes in Nepal" which funded one undergraduate researcher as part of the larger BCS 1547377 RAPID: "Narrating Disaster: Calibrating Causality and Responses to the 2015 Earthquakes in Nepal").

Moreover, NSF (along with the National Endowment for the Humanities) has partnered to fund projects that overlap in meaningful and substantial ways with other agency programs (e.g. Linguistics, Sociology, Tribal Colleges & Universities Program, Catalyzing New International Collaborations, Robust Intelligence, Political Science, Science of Learning, Arctic Science, Global Venture Fund, NEH Digital Humanities), and has invested in projects that are part of major initiatives, for example, in connection with the Arctic Social Sciences Program in tandem with the International Polar Year Initiative in 2006 and more recently with the International Year of Indigenous Languages (e.g. the January 2019 "Sharing our Findings" portion of NSF 1743743's [workshop](#), "Expanding Linguistic Science By Broadening Native American Participation").

The funded projects mentioned above have bridged established methods and theories with entirely new and innovative methods, modeling, tools, and analyses. As a result, the new field of Documentary Linguistics has emerged. This field overlaps with and complements established fields such as Linguistics, Anthropology, and Information Sciences, providing these established research fields with new methods, tools, and explanatory power.

However, the impacts of DEL funding go well beyond the intellectual merit of its research. There is growing evidence of strong connections between the vitality of heritage languages and well-being in Native American, Alaska Native, and Native Hawaiian communities, which experience high rates of suicide and economic disadvantage. Indigenous communities that have integrated heritage language learning with their suicide prevention programs have achieved outcomes associated with significant reduction in suicide rates, decreases in smoking, and increased rates of high school graduation (Hallett, Chandler, & Lalonde, 2007; Guèvremont & Kohen, 2012; Wilson, 2012). Funding for endangered language science by NSF is providing critical support that ultimately leads to healthier and more resilient individuals in these communities. NSF's DEL, and the language documentation work from DEL funding, has filled a need not accessible or even visible to other agencies. It has facilitated large-scale documentation initiatives, it supports required reporting and outputs that are part of the public domain, it recruits undergraduate and graduate students to participate in research, and it prioritizes community involvement in efforts that facilitate language preservation and revitalization. Its impacts are critical to the health and well-being of indigenous peoples in the U.S. and around the globe.

In early 2019, the Directorate of Social, Behavioral, and Economic Sciences (SBE) of NSF repositioned some of its programs in an effort to: 1) respond to emerging areas of scientific inquiry; 2) help researchers connect their plans to national priorities; and 3) make the value of research in the SBE sciences reach a wider set of stakeholders. Among these changes was the name change from Documenting Endangered Languages (DEL) to NSF Dynamic Language Infrastructure-NEH Documenting Endangered Languages (DLI-DEL) and the merging of DEL/DLI program management into the Linguistics Program. Coinciding with this merger was the opportunistic cutting of DEL's dedicated PO, who had expertise in the science of endangered languages and experience working with Indigenous scholars/communities. A new funding initiative, called "[Build and Broaden](#)" (B2) has been announced as a partial replacement for DEL's previous

functions, as B2 is aimed at enhancing SBE-related research through better partnering with minority-serving institutions. This may hold potential for some of the 32 TCUs in the U.S. However, with 574 federally recognized Native tribes in the U.S., TCUs represent only a fraction of the potential for capacity-building among indigenous research and education initiatives.

We view this as a serious concern. Without a dedicated PO who understands the community, effective outreach and capacity building is simply not possible. We endorse the recommendation of BCS's most recent (2019) Committee of Visitors: To create “a dedicated Program Officer (PO) position within Linguistics to ensure the continued specialized process of nurturing and maintaining relationships with diverse institutions and Indigenous scholars and communities” (<https://www.nsf.gov/od/oia/activities/cov/covs.jsp>).

This paper presents an opportunity to share the accomplishments and goals of language documentation in the science of endangered languages, with an eye towards securing and nurturing the future of funding for documentation, preservation, and revitalization initiatives. In the following sections, we outline some of the most significant impacts of DLI-DEL-funded work, and then we present some recommendations for the SBE Directorate, BCS Division, and DLI-DEL Program for preserving these critical activities and the communities they serve.

### **The Merit and Impacts of DEL-Funded Work**

"We are asked, at the very least, to recognize the social and political roles we play and not to pretend that our role is 'purely scientific' and neutral. We are additionally asked, and this is much more difficult for us, to accept that speakers of the languages we work with, not professional linguists except insofar as they coincide, are the ultimate judges of what should or should not be done with their languages."

Nora England (1992)

DEL has been instrumental in helping to nourish the science of endangered languages; indeed, it has done more than merely respond to the threat of language extinction by supporting a new discipline of *Documentary Linguistics*, not duplicated elsewhere within NSF, nor by other funding agencies in the US and abroad. We summarize here some of the many achievements and innovations in this newly emergent field that are relevant to Intellectual Merit and Broadening Participation.

#### Intellectual Merit

1. Rethinking these methods and tools from indigenous and community-internal perspectives For example, BCS 1360839 (P.I.'s April Counciller and Alisha Drabek), members of the Alutiiq Heritage Foundation, worked with a strong team of community members, linguists, archivists, and museum curators to build a comprehensive database of one highly endangered language, Kodiak Alutiiq spoken in coastal Alaska (Alaska Peninsula to Prince William Sound). This project, conceived of and managed with community needs at the forefront, is a model for other communities on how to create a rich corpus for linguistic analysis and community use and how to curate data. It provided data access and search capabilities, and filled gaps in the database by recording missing genres or interaction-types from speakers.

## 2. Cataloguing/metadata, access, and citation innovations

For example, BCS 1664070 funded work resulting in "Kani'āina, Voices of the Land," was the first online repository of 'Ōlelo Hawai'i spoken by L1 speakers (P.I. Larry Kimura). [Kani'āina](#) is a digital repository with a bilingual 'Ōlelo Hawai'i and English interface that currently provides interactive access to 525 hours of audio recordings, including the celebrated Ka Leo Hawai'i radio broadcasts that aired between 1972 and 1988. These recordings preserve Hawaiian language and cultural knowledge shared from among Hawai'i's last L1 'Ōlelo Hawai'i, born between 1882 and 1920. Most are from this birth range, and just a few are from younger generations of first language speakers. The Kani'āina website is hosted on Ulukau, a bilingual digital library interface that, with some 2 million page-hits per month, is already arguably the single most-accessed site for 'Ōlelo Hawai'i materials. In addition to providing an interface for listening to spoken 'Ōlelo Hawai'i recordings, Kani'āina, in partnership with the Kaipuleohone Digital Language Archive, properly preserves recordings and transcripts permanently archive and implement a procedure for crowdsourced transcription of additional recordings from the public and from University of Hawai'i students of 'Ōlelo Hawai'i.

## 3. Intersections and cross-overs from Linguistics to other fields (including fields that would seem quite distinct from Linguistics)

For example, BCS 1761613 (P.I.'s Carrie Cannon and Michael Wilkin) investigated how traditional indigenous scientific (botanical) knowledge, encoded in Pai languages at the U.S.-Mexico border, should best be documented, and developed protocols for accessibility of the appropriate knowledge. The Pai languages are spoken in a region of significant biological diversity, where harvests, the lifespan of plants, and the temporal boundaries of seasons are undergoing rapid transition. This, together with the severely endangered status of all Pai languages, makes this work urgent. The team was led by and composed of indigenous scientists and language scholars, meaning activities were conducted with community benefits foremost.

## 4. Innovations in documentation methods and tools

For example, BCS 0966461 (P.I. Jonathan Amith) produced extensive documentation of the phonetics, phonology, and morphosyntax of Yoloxóchtl Mixtec, an under-studied, isolated Mixtecan verb-initial language spoken by 15,000 people. This project provided a detailed morphosyntactic study of this unusual syntactic type and addressed research questions, such as the pragmatic and discourse implications of nonbasic word order. The development of both an extensive corpus of transcribed natural recordings and elicitation material targeting specific questions in YM morphology and syntax provided a rich set of materials for linguistic research. This project provided extensive primary documentation and established an analytical base for future linguistic studies in which Yoloxóchtl Mixtec is of typological interest.

## 5. Discoveries about language coming from documentation efforts

For example, BCS 1664335 (P.I. Laura McPherson) documents the Seenku language of Burkina Faso, and includes discoveries about what the musical instrument, known as the balafon, reveals about Seenku phonology. In the course of documenting Seenku McPherson learned of a musical surrogate language on the balafon. By encoding the tone and syllable structure of the spoken language, musicians are able to communicate without "uttering" a word. Deeper investigation has revealed that the balafon encodes only lexical and grammatical tone, eschewing postlexical phonological tone processes common in the spoken language. This

discovery offers a glimpse into Seenku speakers' metalinguistic knowledge and provides evidence for psychologically real distinctions between levels of the morphophonology.

### Broader Impacts

#### 1. Broadening researcher participation

For example, BCS 1743406 (P.I. Mary Linn) organized an interdisciplinary workshop on North American Indigenous learning. This workshop enabled interdisciplinary discussion and identification of important research problems to be addressed in indigenous learning, and subsequently, how science-based evidence from such research could be used to inform educational practice and policy.

#### 2. Capacity-building

For example, BCS 1500605 (P.I. Susan Gehr) arranged workshops to share state-of-the-art techniques in archiving and preservation methodologies to community members with the view to supporting sustainable archiving practices in the community. This resulted in new infrastructure in the Karuk community, with community input. This project resulted in a freely available collection guide for the Karuk language materials created and collected by the Karuk Tribe's Language Program.

#### 3. Community as origin of decision-making and approaches

For example, award FN-50072-10 (submitted as BCS-1003881) made it possible to produce major documentation work for the language of the four Wampanoag Tribes through the Wôpanâak Language Reclamation Project. Wampanoag was the first Amer-Indian language to employ an alphabetic writing system and the documents surveyed date from the 17th to the 19th centuries. Jessie "Little Doe" Baird served as the P.I. for this project, which utilized language documents from the seventeenth and eighteenth century to create the first Algonquian Grammar. Each term is explained, making the grammar accessible to laypersons and linguists, and served as a template for the production of grammars in other Algonquian languages.

#### 4. Literacy-building

For example, BCS 1603323 (P.I. Christian DiCanio) provided training for three speakers in Triqui literacy who subsequently did most of the work to complete the transcription of 27 hours of narratives and conversations in the language. These speakers participated in literacy workshops held in the community in 2018 and 2019, where additional pedagogical materials were created by the P.I. (DiCanio) and the language community.

Also, BCS 1563672 (P.I. Theodore Fernald) organized summer workshops to train the next generation of Navajo language scientists aimed at broadening the participation of Native Americans in the social sciences. The workshops trained college and linguistics students and Navajo Nation teachers in language documentation and analysis by teaching the linguistics, transcription, and annotation skills necessary to create a bilingual Navajo digital text corpus. The project broadly impacted students in K-12 Navajo classrooms by working with language teachers on applying the analysis of Navajo grammar to language teaching.

#### 5. Undergraduate student training

For example, BCS 1500755 (P.I. Wilson de Lima Silva) supported undergraduate student and community-members' involvement in creating computer animation of Desano narratives. This project also included an undergraduate biology major student who was involved in creating an ethnobotanical catalogue.

#### 6. Building relationships with community leaders and members

For example, BCS 1761658 (P.I. Sadaf Munshi) documented Mankiyali, a severely endangered Indo-Aryan language of Pakistan, which exhibits features that are of interest to phonologists, typologists, sociolinguists, and historical linguists. This project emphasized fostering ties between Pakistan through a local university, a non-governmental organization, and the Mankiyali community, and the University of North Texas (UNT). The project supported binational relationships that functioned as a type of "soft" diplomacy. The project also offered research opportunities and participation in training workshops for UNT students, who have benefitted from the international exchange, acquired skills in organization building and leadership, and have become prepared as they enter a global STEM workforce.

#### 7. Drawing in broader audiences

For example, BCS 1149639 (P.I. Kristine Hildebrandt) employed innovative methods of language documentation for four languages spoken in a highly multilingual region of Nepal, a project that also involved and benefitted diverse populations (community members, Nepal-U.S. cross-institutional relations, and employed university students from America and from around the world). Of particular note is the establishment of an online, freely accessible, multimedia [interactive language atlas](#), which makes use of free and open-access digital tools. This project also documented the approaches used in digital outputs such as these, so that others may make use of the same tools and methods.

Also, NSF's recent [Arctic Horizons Report](#), a report developed through a multi-institutional process that consisted of five workshops and a synthesis meeting, stated that science needs to address the "rapid loss of cultural heritage, including the loss of indigenous languages; invest in language research and revitalization; improve and support research communication with indigenous communities; and invest in data management, maintenance and services for sharing, discoverability and access." DEL, in collaboration with the Arctic Social Science Project, has been the one NSF program that does this.

### **Empowering and Sustaining Language Documentation in the 21st Century: Recommendations for the Role of DLI-DEL**

"While it is good and commendable to record and document fading traditions, and in some cases this is absolutely necessary to avert total loss of cultural wealth, the greater goal must be that of safeguarding diversity in the world of people. For that is the circumstance in which diverse and interesting intellectual traditions can grow."

Ken Hale (1992)



Despite all of the achievements made via DLI-DEL-funded projects, both within established fields and as part of this newly emerging one of documentation research, the reality is that the endangered languages crisis in the twenty-first century is not over. If anything, the crisis has accelerated. Now more than ever, there is the need to continue with a dedicated program that serves to fund and facilitate documentation research *by, with, and for* vulnerable language communities. To the extent that a language is known to just a few elderly speakers, we risk losing forever important documentary and behavioral evidence of human cognition and cultural variability. The human heritage embodied by endangered languages constitutes scientific data that cannot be allowed to disappear, and language documentation research should expand beyond what has been termed in the journal *Science* as the "WEIRDos" (Western, educated, industrialized, rich, and democratic; Kupferschmidt, 2019). This broadening has the potential to uncover extremely valuable differences in perception, categorization, thought processes, and lived experiences, all encoded in native languages. Furthermore, a native language marks the political and social identity of its speakers, who, in these cases, are all too often those who have been economically, educationally, and politically disadvantaged. With this growing need in mind, our collective makes the following recommendations:

1. We recommend that DLI-DEL remain a separate program, with a full-time, dedicated Program Officer. A PO for DLI-DEL would provide continuity in promoting innovations in funding initiatives and opportunities, providing education and guidance to prospective PI's, and collaborating with invested individuals and organizations. There is a strong and justifiable need to have a specialist in this dedicated field lead the program, someone who knows the scholars, traditions, methods, research questions, models and needs of the research community. This is entirely consistent with the recommendations by the BCS Division's Committee of Visitors.
2. We recommend significantly increasing collaboration and outreach, not only to TCU's (of which there are 32 in the U.S.), but also to the relevant tribal and indigenous administrative units associated with over 500 federally recognized tribes in the U.S. NSF DLI-DEL is an unusual program in that it must support not only data collection and scientific theory, but also awareness, community-building, and research and education infrastructure in the U.S. in order to elicit strong proposals and successful projects.
3. We recommend that NSF DLI-DEL sustain its support of international documentation projects, more specifically, to increase U.S. researchers' capacity to work in regions with under-described languages, in a way that facilitates language training programs to community members and supports linguistic instruction in those languages.

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