# NATIONAL INSTITUTE OF STATISTICAL SCIENCES

## ANNUAL REPORT

July 1, 2020 – June 30, 2021

### AFFILIATES - EARLY CAREER


### VIRTUAL SERIES


### RESEARCH


### INGRAM OLKIN FORUMS

## *From the Leadership…*

This year at NISS was all about making new connections, expanding focus, and broadening impact. NISS met the challenge of becoming a vibrant institute without walls, its agenda largely driven by COVID-19. The end of the year saw the very welcome beginning of the transition back, with NISS personnel in their offices at 1750 K Street and a hope for the resumption of in-person events.

Three strategic objectives dominated the year of purely Virtual NISS. NISS's expanded suite of programs, focusing on the most relevant contemporary issues, brought new national and now international !! audiences to NISS.

NISS increased the opportunities and the engagement of junior colleagues with online series addressing critical issues for early career success and inaugurating a NISS Graduate Student Network.

NISS research continued on all fronts – at NISS, with collaborating university faculty and students, onsite-but-working remotely at a federal agency – leading to awards and recognition for research on high priority projects. Again this year, the federal evaluations of NISS performance were "Exceptional" in all categories.

NISS finished the year financially strong with a clean audit and a cash balance and an increase in total assets. Looking backward at the strange but amazing year full of activities and accomplishments, the challenge now for NISS is to continue to be agile and inventive in a dynamic world.

James Rosenberger, PhD
Director

Nell Sedransk, PhD
Director-DC

**National Institute of Statistical Sciences**

# NISS HIGHLIGHTS FROM 2020-2021

## Virtual NISS

When Covid brought in-person events to a standstill, NISS had already established a virtual presence, reaching audiences in the hundreds with the ongoing series of NISS-Merck Meet-ups on statistical issues for biopharmaceutical research and development. The pair of Town Halls on modeling the Covid epidemic, that were hosted by NISS in conjunction with ASA and ISI, launched a Virtual NISS agenda on Covid-related issues beginning with a tutorial for statisticians on SIR modeling. A 14-part webinar series on technical issues in statistics, epidemiology and data science was hosted by NISS in partnership with COPSS. The Ingram Olkin Forum (IOF) focused a six-part series on the impact of Covid and the consequences from unplanned disruptions of clinical trials in medical research. As the impact of closed school buildings began to be felt, NISS held an IOF on modeling for reopening and for measuring the learning deficit. The first joint conference supported by CANSSI and NISS continued the focus on data science and health, originally planned for University of Waterloo, was held virtually in May 2021.

Simultaneously, other virtual programming went forward with a new 11-part tutorial series on data science advances for business analytics. In addition, the NISS-Merck series continued with three meetups; and the IOF devoted a forum on the issues of implicit social inequities in algorithms used in a variety of settings. As local in-person connections became virtual around the world, access to NISS events opened to an increasingly wide international audience. And it has been possible to make events, in part or in whole, available subsequently via the NISS website and via our YouTube channel to the world.

## Junior Colleagues

This year NISS accelerated the expansion of programs for early career statisticians; and they responded enthusiastically with proposals for initiatives and energy to effectuate them. Existing programs like the Writing Workshop (conducted with support from NSF, ASA and other professional societies) and traditionally held in conjunction with JSM again moved to virtual mode, a new schedule, and international participation. NISS Affiliates' Associate Liaisons served as chairs for the continuing NISS series of career fairs – five during this year. NISS's launched its first student contest, "SAID . . . in Graphics!", challenging graduate students to produce creative and effective interactive graphics for online reports of education data.

The NISS Graduate Student Network was organized by a cadre of students at NISS Affiliates. It rapidly came together, energized via virtual connections, to hold four GSN "Socials" and two meet-ups with recent alumni. Virtual GSN events focused on the skills for successful transition to careers in statistics from presentation of research to job interviews and fundamentals for statistical consulting. The culmination of this year for GSN was its first annual research conference, held in June 2021.

## Research Agenda

Research blossomed. Tangible evidence for virtually every project took the form of technical manuscripts for refereed journals. Every single NISS Research Associate was recognized for their work with an award! "Top Ten" projects at USDA-NASS moved new methodology from theoretical development into implementation and production.

Three influential expert panels assembled for NCES set a vision for change as part of the transition back from restrictions to a purely virtual world. As the final year in the current ten-year NCES contract with NISS ends in December 2021, big projects in collaboration with Universities of Missouri and Michigan are coming to culmination. Additional phases (for future contract) are under discussion for using fine-grained (historical and survey) data to fully test and validate the new SES index that integrates geographically linked information from multiple sources. Completion of the comprehensive review and analysis of non-response bias analysis/adjustment methodology, opens the question of innovations and their feasibility given the now-available technology and resources. Phase I of a new project in development of interactive graphics and guidelines for online NCES reports is beginning.

**On the Cover**

L to R: **Esra Kurum** (University of California, Riverside), **Sumanta Basu** (Cornell University), **Piaomu Liu** (Bentley University), **Jessica Li** (University of California, Los Angeles), **Claire Kelling** (Penn State University), and **Michael Jadoo** (Bureau of Labor Statistics).

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## NEW STAFF

**Brian T. Habing, PhD |** an Associate Director for Education Activities and Research works with the DC Office of the National Institute of Statistical Sciences and is Associate Professor of Statistics at the University of South Carolina. His research has focused on psychometrics and scale construction, with a particular emphasis on multidimensional item response theory. He is also interested in statistical education, including work with AP Statistics and the development of new courses at the undergraduate and graduate level.

**Bruce Craig,** Professor of Statistics and Director of Purdue's Statistical Consulting Service, also an elected Fellow of the American Association for the Advancement of Science and Fellow of the American Statistical Association. He brings his expertise on development of novel statistical methodology to work with the National Agriculture Statistics Service (NASS), focusing on combining data from heterogeneous sources to improve survey design, estimation, and prediction from high-dimensional data analysis methodology.

**Zachary Terner, PhD |** a new Research Associate. Zach is a postdoctoral fellow for NISS, who works with the National Agricultural Statistical Service. He received his Bachelor of Science degree in Systems and Information Engineering and a Bachelor of Arts degree in Statistics before receiving a Master of Science degree in Statistics, all from the University of Virginia. He earned his Ph.D. in Applied Statistics from the University of California, Santa Barbara.

**Alexi Albert |** a Research Assistant at NISS, works with the National Center for Education Statistics. She is currently completing her Master of Science in Mathematics and Statistics from Georgetown University. She received her Bachelors of Science in Middle Level Mathematics and Science Education from the University of Maryland in College Park. Prior to graduate school she taught sixth grade math for two years in Eastern Washington State.

**Megan Glenn |** the Administrative Assistant at NISS Washington, DC office provides operations and media support to multiple NISS activities, in particular the Ingram Olkin Forums, the Graduate Student Network, the NISS events management and databases and social media presence, advertising research workshops and conferences through social media platforms. She received her BS Environmental Studies degree from Keene State College in New Hampshire.

## NORTH CAROLINA

The NISS Building in Research Triangle Park is currently partially leased and dialogues with prospective purchasers for the property continue. The original NISS building is occupied by Teledyne with a 10-year lease ending 30 Sep 2029. Teledyne also occupies the upper floor of the newer wing, on a 2-year lease through January 2022, with an option to continue through 2029. SAMSI once again occupied the lower floor of the newer “SAMSI” wing through the end of June 2021. Discussions with one hopeful prospective purchaser have slowed as his negotiations with TUCASI appear to be stumbling, making successful conclusion of a purchase agreement unlikely. Alternative prospects are being actively pursued.

## IN MEMORIAM

With sadness we note the loss this year of **Allan Sampson**, Professor of Statistics, University of Pittsburgh, on January 30, 2021. He was a beloved colleague, mentor, and ardent supporter of NISS. Most recently he served on the Ingram Olkin Fund Committee and contributed to making this impactful series of forums available to the NISS and the larger statistical community. He co-chaired the Organizing Committee for the inaugural Ingram Olkin Forum entitled “Gun Violence - The Statistical Issues” held in June 2019.

NISS also mourns the passing of **E. James Harner** on February 9, 2021. Dr. Harner was Professor Emeritus of Statistics, West Virginia University, where he had also served as Chair of the Department of Statistics and Director of the Cancer Center Bioinformatics Core. He was Chairman of the Interface Foundation of North America which has partnered with the American Statistical Association to organize the annual Symposium on Data Science and Statistics beginning in May 2018. His additional contributions to NISS include designing and teaching workshops and tutorials, especially related to tools for creating efficient data science workflows.

## JEROME SACKS FOR OUTSTANDING CROSS-DISCIPLINARY RESEARCH

Francesca Dominici

**FRANCESCA DOMINICI**, the Clarence James Gamble Professor of Biostatistics, Population and Data Science at the Harvard T.H. Chan School of Public Health, and Co-Director of the Data Science Initiative at Harvard University, is the 2020 recipient of the Jerome Sacks Award for Cross-Disciplinary Research is the 2020 recipient of the Jerome Sacks Award for Cross-Disciplinary Research.

Francesca's citation reads: "For her leadership in high-impact cross-disciplinary research that brings together statistical innovation, heterogeneous data, and diverse scientists to address critical challenges in environmental epidemiology, especially regarding the effects of air pollution on public health."

## DISTINGUISHED ALUMNI

The 2020 recipient of this award is **JENNIFER L. CLARKE**, Professor of Statistics and of Food Science and Technology at the University of Nebraska- Lincoln. Since 2013, she was Director of the Quantitative Life Sciences Initiative, a cross-campus data science research and training initiative. Jennifer was a NISS postdoctoral researcher for 18 months under the mentorship of Jerome Sacks, with guidance from Stan Young and Alan Karr.

Jennifer's citation reads: "Honoring her distinguished career and research contributions in computational biology, bioinformatics and statistical methods with applications to human health and plant sciences, and for her excellent service at the university level and in both national and international organizations."

Jennifer L. Clarke

## DISTINGUISHED SERVICE

**CHRISTY CHUANG-STEIN** is an independent statistical consultant with 30 years of experience in the pharmaceutical industry. She was Vice President, Head of the Statistical Research and Consulting Center (SRCC) when she retired from Pfizer in 2015. Christy is a Fellow of the American Statistical Association with more than 145 publications including several book chapters and two books. Christy was a vice president of the ASA, (2009-2011), and she received ASA's Founders' Award in 2012 and the Distinguished Achievement Award of the International Chinese Statistical Association in 2014.

Christy Chuang-Stein

Christy's citation reads: "For her distinguished service to NISS serving two terms on the board of trustees, for her excellent leadership as chair of the Affiliates Committee for three years, and as vice-chair of the board. Christy established planning committees in both the Academic and Government Affiliate Programs and led the efforts to expand and enrich the value proposition for Affiliates in both programs through activities such as Meetups, webinars and career fairs."

# NATIONAL AGRICULTURAL STATISTICS SERVICE (USDA)

## AWARDS AND RECOGNITION

During 2020-2021, the USDA presented two major awards to NISS personnel: the annual award to a selected individual for contributions to NASS research and implementation; and a life-time award for profound contributions to the USDA. In addition, each of the NISS Research Associates received one or more awards in recognition for their work on high-priority NASS projects.

**Lu Chen, PhD**, NISS Research Associate

Citation: For outstanding contribution on improving the estimation processes for Farm Labor and Crops County Estimates programs, for producing more efficient and transparent Crops County Estimates with CVs and for reducing the burden of the field office review.

**Phillip S. Kott, PhD**, RTI International

The NASS Hall of Fame inducted Phil Kott as an honored individual who have made lasting contributions to the quality of information the National Agricultural Statistics Service collects and its mission of providing timely, accurate, and useful statistics in service to US agriculture. The Hall of Fame recognizes the talent, vision, and energy of individuals whose contributions to NASS and to agricultural statistics transcend time and continue to have impact. Individuals honored in the Hall of Fame exemplify integrity, honesty, innovation, and commitment to public service.

## NISS-NASS TEAM RESEARCH

NASS conducts research in cross-disciplinary teams assembled to meet the specific goals for each project. NISS Research Associates contribute technical statistical and computational expertise, developing models and methodology, designing and conducting simulation and data-based experiments. NISS Senior Fellows mentor NASS and NISS researchers and guide the development of statistical innovations from vision through development and validation. Each of the projects that follow currently involves NISS Research Associates and/or Senior Fellows as key technical personnel or leaders.

### Small Area Estimation – Models and Implementation

#### *Model Development*

Small area models for integrating survey estimates with auxiliary information and historical data can provide more reliable official estimates and simultaneously quantify the associated uncertainties. At the same time statistics for national, state and local agriculture data must satisfy both certain constraints and also bounds (inequality constraints) based on administrative data. Several Bayesian hierarchical models have been developed for estimates of different quantities NASS publishes on a scheduled basis. Sub-area hierarchical Bayesian models allow for inequalities as well as fixed constraints while a full Bayesian approach presents serious computational challenges. Administrative data may provide inequality constraints (lower or upper bounds) while the nested sub-area totals must sum exactly to the next level of hierarchy (i.e., county totals to state totals to national numbers).

Once a model is created, the transition from model development to implementation begins with simulation, testing and validation, before moving into implementation. This final transition step also requires cleaning and revision of all code including data processing, modeling and aggregating and multi-level documentation in order to transfer from research mode to operational model for production teams to employ.

NISS and NASS initiated this project as part of the *NISS-NASS Cross-Sector Research Program* in 2009, with Professor **Balgobin Nandram** (Worcester Polytechnic Institute/NISS Senior Mentor) leading the technical work that he continues to the present, now also involving **Lu Chen**, NISS Research Associate.

## NATIONAL AGRICULTURAL STATISTICS SERVICE CONT.

### *County Crops Estimates*

The first small area estimates to move into implementation were the county crops estimates that were introduced into production for NASS 2020 publication. NASS-USDA annually publishes county-level estimates of planted acreage, harvested acreage, yield, and production. These official statistics are important to farmers, ranchers, and also to other Federal agencies for planning and decision making. NASS responded to the recommendations from the National Academies of Sciences, Engineering and Medicine expert panel by focusing effort on development of small area models that integrate multiple sources of information to produce more precise county-level estimates. The major challenge for a model-based approach is to provide these sub-area individual crop estimates and associated measures of uncertainty that are reliable and coherent, satisfying the important relationships nested among them and across crops. Several Bayesian sub-area hierarchical models were tested using 2014 data for corn (planted acres). The clear winner incorporated both fixed and inequality constraints and simultaneously improved precision NASS transitioned from the traditional Agricultural Statistics Board Review process to model-based approach for the first time in 2020 when the small grains county estimates were released in December 2020. Row crops county estimates followed in January 2021; publication will next include the other 11 crops that are regularly reported.

**Lu Chen** and the *County Estimates Modeling Implementation Team* were recognized in April 2021 with a NASS *Circle Award*.

### *Farm Labor Estimates*

Small area estimates also moved into implementation in 2020 for farm labor estimates of number of workers, durations of workweek, and wage rates. USDA-NASS annually conducts the Farm Labor Survey on the status of the agricultural workforce. The small area Bayesian model for these estimates (like those for crops) incorporates relevant exogenous variables with the survey data. In addition, temporal dynamics, derived from previous years' data and official values, are introduced into the model. By adopting integer calibration methodology (previously developed for Census of Agriculture data) to reduce the value of inflated unit-level-survey weights, this model has achieved three important goals: improving precision, satisfying constraints, reducing outliers' impact.

As part of validation, a case study also demonstrated improvement over the direct survey estimates for areas with small sample sizes. This methodology incorporates auxiliary information by borrowing information across geographic areas and subareas. The resulting framework provides a complete set of coherent estimates for all required geographic levels.

**Lu Chen** and **Luca Sartore** and the *Farm Labor Team* were recognized in April 2021 with a NASS *Circle Award* for Implementing new Farm Labor statistics requested by the Secretary of Agriculture.

### *Cash Rental Rate*

Agricultural cash rental rates at state and county levels have taken on increased importance due to their application in rental agreement formulation, federal farm program administration and related activities. Previous estimates modeled on two years' historical data have suffered from problems with missing data, and severe outliers; in consequence the estimates do not always meet the constraint of non-negativity.

Small area models are in development/testing to solve those problems and provide reliable model-based estimates, incorporating detection and reweighting of influential records.

## New Directions in Survey Design

### *Web-Scraped Sampling Frame*

NASS is investing research resources to explore ways to improve estimates and to lower costs by leveraging new statistical methods and technologies. The annual USDA June Area Survey (JAS) that produces comprehensive estimates of land uses and agricultural activities takes a significant portion of the NASS budget. At the same time under-coverage remains a problem. If viable, a web-scraped sampling frame would reduce costs dramatically for a

national-scale survey by decreasing or eliminating the expensive in-person sampling. However, viability of using a web-scraped frame depends upon producing estimates of equal or higher quality and improved precision as well as lower cost. The non-trivial differences both in coverage and in sampling probabilities for unit selection between a web-scraped frame and the current list frame also carry implications for estimation methodology.

NASS designed this project to assess the viability of replacing (or reducing) the JAS area-frame by a web-scraped frame. Based on pilot experiments, the strengths, weaknesses and differences of the two types of sampling frame were evaluated. These results suggested optimizing with a combination frame. Theoretical development of a dual-frame model leading to establishing the statistical properties of estimators is required, with simulation to follow and finally validation with existing fine-scale data.

### *Propensity Scoring for Sample Selection*

Survey costs are driven up by follow-ups to initial non-response. Selectivity in returning to non-responders could reduce data collection costs and would be attractive IF integrity of resulting estimates would not be compromised. Propensity scores are used in other federal statistics contexts (including NCES surveys) in sample selection and the data collection process to achieve such selectivity. NASS is reexamining propensity and impact scoring to consider application in the agricultural survey context. With development of new methodology, the analysis of properties of the resultant estimators and the demonstration of performance of the estimates follows. Evaluation of estimates and the estimates of their associated uncertainties will be done first via a simulation study, then followed by validation using fine-grained (recent) historical data. For successful implementation, practicalities will also require computational scalability without loss of statistical properties.

### *Dual System Estimation*

The United States Census of Agriculture is conducted every five years to provide a complete enumeration of US farms and ranches. However, because the Census is survey-based, survey weights are computed using a DSE (Dual-System Estimation) methodology based on logistics models. Since these models do not accommodate nonlinear effects, which can impact calibration performance, and uncertainty estimation, alternatives are being studied. DSE methodology and its effects on calibrated estimates and related uncertainties. Fitting power transformations on logistic-model covariates seems to stabilize fitting algorithms, potentially reducing bias but with as yet undetermined effects on calibration, estimates and uncertainties. Thus far, a fitting algorithm that deals with nonlinear effects has been developed, documented and prepared for the initial testing.

### *Respondent Burden Analysis and Reduction*

A project spanning several surveys that are conducted on a regular basis examines the value to respondents of automatically pre-filling surveys with respondents' own unedited answers from previous occasions. Some questions do not frequently have changes to previous answers, for example: total cropland. The risk of prefilling is the potential sacrifice of accuracy and/or precision due to the ease for a respondent to skim over prefilled questions, rapidly clicking to confirm answers that should be updated. This study involved an experiment to examine the frequencies and the accuracies for updates and edits. It also included paradata to assess the respondent burden and to detect response speeds (times from survey request to submission of completed survey).

**Zach Terner** received a *NASS Achievement Award* for his work in analyzing the complex data for this project together with his work on the June Area Survey study of web-scraping.

## Combining Heterogeneous Sources of Information

### *Integrated Modeling and Geospatial Estimation Modeling System*

The continuing pressure to provide estimates and predictions at ever-finer geographic scales and ever shorter and more frequent time intervals has demanded new approaches. Chief amongst these is the development of a modeling framework that utilizes all available data, e.g., satellite imagery data, historical cropland and pricing data, weather

## NATIONAL AGRICULTURAL STATISTICS SERVICE CONT.

data, soil data and survey data. In an ambitious research project, NASS is seeking to develop a field-level model or system of models capable of predicting crop production, i.e., acreage and yield, from preseason baseline prediction to harvest, with frequent prediction refinements as crops are planted, emerge and grow through various stages, and continuing further to predict the next crop rotation. The rationale for such a system of models is to compensate for the declining survey response rate and simultaneously to improve predictive performance.

Development and pilot testing of a benchmark trend model for preseason prediction (for corn and soy) has been completed using historic data for 2007 through 2020. Simultaneously statistical methodology for a system of models is being developed to leverage machine learning algorithms to combine remote sensing data, administrative and survey data. Computational challenges (e.g., code for high-resolution maps) have been met using cloud-based technologies. Also a Markov chain model has been developed, capable of predicting the next crop rotation at fine-scale spatial resolution for 48 states. Uncertainty layers (based on empirical entropy), and the acreage assessment (with related uncertainties) have been produced from this model for over 100 crops.

This Integrated Modeling and Geospatial Estimation System Project is one of the "USDA Top Ten" research projects. NISS Research Associates, **Luca Sartore** and **Zach Terner**, respectively, are leading the development of an innovative comprehensive model/system and the development of a conventional methodology benchmark model.

## NATIONAL CENTER FOR EDUCATION STATISTICS (US DEPT. OF EDUCATION)

### NISS-NCES EXPERT PANELS

#### The Panels

Each year NISS convenes several panels of technical experts on high priority topics for the National Center for Education Statistics (NCES) within the Institute for Education Sciences (IES) at the US Department of Education. Topics range from technical *statistical issues* such as survey design, assessment design, non-response bias adjustment and data visualization to *data issues* such as release of keystroke process data and building data foundations for policy-making to *survey methodology* such as recruitment and data collection monitoring to *quantitative methodology* such as definition/metrics for effect size and computer-adaptive mode.

The purpose of each panel is to provide NCES with timely expert input on issues of concern to NCES and/or information on which to base decisions. Therefore, panels meet in intensive brief sessions and are not required to reach unanimity but are asked to fully reflect the arguments when there are alternative views.

The pandemic changed the pattern of a two-day in-person "think tank" to a series of (usually five) 2-hour sessions. The first one or two sessions have been technical working sessions with NCES staff to frame the problem, establish constraints and further define the focus for the experts. The final session, also with NCES staff, is a debriefing with presentation of the panel's findings and further discussion to clarify deliberations and sometimes leading to modulation or expansion of the panel's recommendations. Once approved by the panel, a full written report is submitted to NCES. This report is published on the NISS website as part of the NCES Report Library at NISS after NCES review.

#### NCES Report Library at NISS

Each year NISS convenes several panels of technical experts of high priority topics for the National Center for Education Statistics (NCES) within the Institute for Education Sciences (IES) at the US Department of Education. Following review of the panels' reports, these are included in the NCES Library on the NISS website where they are publicly available.

Topics include contemporary technical statistical issues in survey design and estimation, data issues from data definitions to file structure, foundational information for policy-making, and quantitative methodology. The Library currently contains 34 panel reports (Appendix E); 24 of these panels met within the last decade. NCES REPORT LIBRARY.

## NATIONAL CENTER FOR EDUCATION STATISTICS CONT.

# IES/NCES 2020-2021 EXPERT PANELS

## Post-Covid Surveys

NCES undertakes complex and extensive cross-sectional and longitudinal surveys on a national scale. The pandemic has dramatically disrupted the survey process and some adaptations have already been made for the closure of in-person schools. However, looking to the future not only must the survey process accommodate change, the purposes and content for surveys will change. Even more questions will focus on the changes in education and the impact of lost learning opportunities. Therefore in December 2020 NISS convened an expert panel to focus on the survey context and methodology.

Charge to Panel on *Post-COVID Surveys:*

The ramifications of the COVID-19 pandemic include a more technologically savvy populace, increasing unwillingness to participate in governmental efforts, as well as the obvious and enormous shift to virtual mode for education at all levels. At NCES the readily apparent necessity for change is accompanied by the opportunity to redesign data collection practices, also incorporating changes that are overdue. The panel is asked to take a *tabula rasa* approach to two inextricably related aspects of future NCES data collections and to provide recommendations about the most fruitful avenues to pursue.

- Engagement of participants, whether establishments (school, governmental education office, etc.) or individuals (education administrator, teacher, student, parent)
- Sampling design and data description/estimation methodology

The Principal Finding from this panel, taken from the Executive Summary of the panel's report, is for IES/NCES to implement a recognized functionally coherent and transparent structure to replace/reorganize loosely connected collection of separate surveys and assessments. LINK TO REPORT EXECUTIVE SUMMARY.

Specific additional findings addressed

- Recognition and Trust
- Relationships
- Opportunities

## Setting Priorities for Federal Data Access to Expand the Context for Education Data

Integration of federal data from other federal agencies with NCES data has become feasible via direct linkage of through GIS linkage. Such sharing can allow new cross-domain investigations (e.g., relationships of proximal environmental hazards to absenteeism and to student performance); they can provide the benchmarking to improve precision or bias estimation and adjustment; also they can reduce respondent burden when information is already available. Actuating linkages incurs personnel (and/or financial) costs for technical expertise and time. Priorities or principles for determining priorities must be set for NCES efforts to access and utilize data outside of the Department of Education, and also for NCES support of external objectives that require education data. The panel was asked to consider meeting the information needs of NCES stakeholders and to highlight particular areas in which integration of data from other sources is vital.

Charge to Panel on *Priorities for Federal Data Access*

Education policy and education research often depend on a richer context than just education data in NCES data collections. The Evidence Act establishes a presumption of accessibility for Federal statistical agencies such as NCES to have access to any Federal data collections where access is not specifically prohibited by law. This panel is charged with setting priorities for enabling integrated perspectives that combine NCES education data with data from other federal data collections. Priorities will be viewed from the view of enhancing primary education information and also from the view of external objectives that require education information for analysis or decision-making (e.g., child health/welfare, juvenile justice, labor force/labor market analysis, environmental/hazards data).

## NATIONAL CENTER FOR EDUCATION STATISTICS CONT.

The panel report identified several domains of national interest to serve as examples. FULL REPORT

Two case studies

- federal tax system data
- geographic information

Five use cases

- school and student safety;
- pollution, health, and long-term student outcomes;
- economic value of industry recognized and/or non-degree credentials for work;
- education careers and labor markets; and
- effects of disruptions.

### Innovative Graphics for NCES Online Reports

With national attention now on the computer screen, it is more urgent than ever before for NCES to move from the current static graphics used in their on-line images of paper reports to dynamic custom graphics. The panel of statistical graphics experts was assembled to address specifically the core issues of technology, information, and form/design, and to outline a way forward.

Charge to Panel on *Innovative Graphics*

Well-designed statistical graphics grab the attention of the viewer and invite curiosity while providing statistically accurate, relevant information, suitably detailed. NCES seeks to move from static maps and graphs to "Living Graphics" that will encourage viewer engagement and navigation for its online reports, with special emphasis on accessibility for the full spectrum of its audiences.

The panel is asked to address four aspects to this transition:

- Technology, Information, Form/Design
- What technology decisions are needed for implementation of a system with a 5-10-year lifespan?
- What kinds of statistical graphics will make increased, relevant and interesting information accessible to viewers?
- What are the design opportunities for interactive graphics and maps to engage viewers?

The panel is charged with identifying key decisions and a program for the transition.

The panel report provided immediate, medium-term, and long-term targets, and appendices with examples (LINK TO FULL REPORT) with detailed sections on:

- knowing the audience
- working with contractors
- creating engaging graphics
- showing uncertainty
- technology
- ethical principles.

# NATIONAL CENTER FOR EDUCATION STATISTICS CONT.

## NCES-NISS RESEARCH PROJECTS

### Statistical Basis for a New GIS-based Socio-Economic Status Indicator

For decades, the primary surrogate economic indicator used for most education (and other childhood) research was FRL: eligibility for free/reduced price lunch (FRL). Redefinitions of eligibility that now vary from state to state have rendered FRL unworkable as an SES index. The potential to use geo-locations (via GIS linking) to incorporate socioeconomic information gathered by other federal agencies, opened the possibility for creation of an entirely new index that could be scaled. Following an NISS-NCES Technical Working Session, the panel of experts made specific suggestions for information to be incorporated. The panel also recommended that to be successful such a new SES measure - not just a poverty index –would need to be robust enough to be stable and reliable as populations shift over time and would need to have a stated uncertainty. LINK TO FULL REPORT.

NCES now has a candidate geographically-based SES index that uses GIS locations for schools and the outlines for their districts. Access to other federally available GIS-linked data, enables coupling of NCES data on schools with economic information from the American Community Survey and also other geographically-based federal data. In general, kriging methodology assumes a homogeneous sample design while NCES data is (spatially) non-homogeneous. New methodology estimation and especially for estimation of variance is needed for this new index.

Phase I of this project is coming to completion with the development and investigation of kriging variance adjustments under the highly restricted conditions that sample data are obtained from known (Gaussian) populations and variogram parameters are known. Even for this case, kriging variance estimates are biased. Sensitivity of variogram estimation as a function of the sampling design has been investigated and a weighted likelihood approach has led to two approaches to variogram parameter estimation. Methodological development and results of simulation studies have been submitted for publication in a refereed journal.

Phase II of this project will continue, again using the Income-to-Poverty Ratio (IPR) for the testing and validation, anticipating further methodological development when the artificial constraints (above) are weakened or dropped. Phase III will be data-based performance testing of preferred algorithms.

Senior NISS Fellow, **Chris Wikle**, and NISS Research Fellow, **Erin Schliep**, at University of Missouri, are providing the technical, statistical and computational expertise for this project.

### Standards and Models for Non-Response Bias Analysis and Adjustment

Increasing levels of non-response to NCES (and other federal agency) data collections have highlighted the need for attention to methodology for non-response bias analysis and adjustment (NRBA). The need for clear understanding of best practices is acute across the range of assessments and surveys undertaken by both agencies and contractors. The goal for implementing advances in NRBA methodology is to yield more complete information and decreased uncertainty.

The first objective was to understand how the pattern and the mechanism of missing data affect the bias due to unit non-response in actual practice as well as in theory. That understanding then enabled development of a statistically sound strategy incorporating new theory and/or methodology as the foundation for best practices for NRBA reflecting advances in statistical methodology.

Phase I of this project examined NRBA in a cross-sectional study context, using the actual (raw, time-stamped) data from the first phase of ECLS-K:2011. The primary conclusion is that the degree of detail possible in NRBA depends on the probability basis for the data collection, i.e., sampling design, the design variables, and other covariates. Expanded auxiliary information, especially from external sources could have great potential for improving the predictors in the adjustment modeling. Detailed results of the principles of NRBA as applied to a cross-sectional study have been submitted for publication in a refereed journal. This article provides the analysis of the ECLS-K:2011 data as a detailed exemplar, and specifies a ten-step process for implementation during ka cross-sectional survey.

## NATIONAL CENTER FOR EDUCATION STATISTICS CONT.

Phase II will examine NRBA in a longitudinal study context, including later phases of ECLS-K:2011 as the test bed.

NISS Senior Fellow, **Rod Little**, and NISS Research Fellow, **Yajuan Si** at University of Michigan and **Ya Mo**, NISS Research Fellow at Boise State and NISS are serving as the statistical resource for this project.

- Engagement of participants, whether establishments (school, governmental education office, etc.) or individuals (education administrator, teacher, student, parent)
- Sampling design and data description/estimation methodology

### Statistical Prediction of Students' Writing Performance

Most U.S. students do not meet grade-level expectations. This prompts the need to ascertain the characterizing variables and contextual variables for students who do not meet expectations. The writing data and the demographic information from the 2011 National Assessment of Educational Progress (NAEP) provide a basis for getting a clear picture of students' writing performance. The challenge is to examine the complex of factors that drive students' writing abilities. Cluster structures are typically modeled using Hierarchical Linear Modeling (HLM) at student and school levels and Hierarchical Cross-Classified Modeling (HCM) at student, school, and subgroup levels. However, non-hierarchical subgroup structures require a different approach such as the data-driven Classification and Regression Trees (CRT).

As expected, based on analysis using both approaches, main effects estimates are similar since both approaches rely on linear model methodology. Also, it is not surprising that students' free or reduced-price lunch (FRPL) eligibility and Individual Educational Plan (IEP) status are the most critical single demographic variables for classification into subgroups of students. Of the variables directly related to writing, students' writing experience and experience with computer use in writing affect performance on the NAEP computer-based writing test, as both analyses show. However, only the CRT illuminates differences among subgroups in the relative impact of each variable and even more importantly the relative importance of the various interactions. Comparison of the two statistical approaches demonstrates that correct identification of students at risk for poor writing performance is improved by enabling modeling with non-linear, non- hierarchical structures. In direct consequence, prediction precision improves and overall and between-school variances are reduced.

**Ya Mo** and **Nell Sedransk** are preparing a second manuscript describing this research for submission to a refereed professional journal.

# FOCUS ON EARLY CAREER STATISTICIANS

## GRADUATE STUDENT NETWORK

In October, NISS launched the NISS Graduate Student Network (GSN) for students at NISS Affiliates. The goals of NISS GSN are to create connections among graduate students from different institutions and to devise programs to meet their contemporary needs. Under this network, activities are organized to help students tackle challenges of graduate programs and to help with planning their future careers. Social (virtual) networking opportunities and webinars on career advice allow graduate students to share experiences regarding their programs, internships they have held and concerns they have in searching for their first positions when they graduate. NISS GSN has already organized successful committee meetings and webinars with assistance from mentors, **Esra Kurum** (UC-Riverside), **Sumanta Basu** (Cornell), **Kevin Lee** (Western Michigan University), and **Piaomu Liu** (Bentley University) who are Associate Liaisons for their NISS Affiliate universities. The GSN has grown to over 45 members in their first year running.

## GRADUATE STUDENT NETWORK CONT.

### NISS Graduate Student Research Conference

The NISS Graduate Student Conference took take place June 12-13, 2021.

The goal of this conference was for graduate students to present either an oral presentation or a poster presentation within 3 categories: Original Research (their own research work), Literature Research (presentation of a published paper that is not authored by the presenter), or Literature Review (presentation on recent developments in an area; giving students a chance to present a couple of papers to highlight recent developments in an area of interest.) In addition to presentations by graduate students, and two invited speakers discussed "How to present your research?" with a social networking hour at conclusion of the conference.

**Dr. John Bailer**, Distinguished Professor and Chair Department of Statistics at Miami U, gave his talk on getting ready to tell the statistics behind the stories and the stories behind the statistics. **Dr. Regina Nuzzo**, Senior Advisor for Statistics Communication and Media Innovation of the American Statistical Association presented on "Making your research make sense: quick tips for talking to non-experts." Eighteen presentations were given from the student's research. The complete list of presenters, their institutions, and titles and abstracts are at Event Link / News Link.

### GSN Co-Sponsored Webinars!

| | |
|---|---|
| 30 November | **NISS Academic Affiliate Meetup: How to Present Your Research**<br>Speakers: **John Bailer,** Miami University<br>**James Booth**, Cornell University<br>**Susan Ellenberg**, University of Pennsylvania<br>**Regina Nuzzo**, American Statistical Association<br>Moderator: **Kate Crespi**, University of California, Los Angeles |
| 18 March | **How to Negotiate a Job Offer (NISS & GSN)**<br>Speakers: **Richard De Veaux**, Williams College<br>**Galin Jones**, University of Minnesota<br>**Bhramar Mukherjee**, University of Michigan<br>Moderator: **Esra Kurum**, University of California, Riverside |
| 30 March | **Toolkit for the Modern Statistician, NISS-GSN**<br>Speakers: **Irina Gaynanova**, Texas A&M University<br>**Brani Vidakovic**, Texas A&M University<br>**Robert Krafty**, Emory University<br>**Martin Wells**, Cornell University<br>Moderator: **Jessica Li**, University of California, Los Angeles |


**Committee Members:**

**Esra Kurum**, Chair, Univ of California, Riverside
**Sumanta Basu**, Cornell University
**Rebecca Kurtz-Garcia**, Univ of California, Riverside
**Xinjun Wang**, University of Pittsburgh
**David Kent**, Cornell University
**Piaomu Liu**, Bentley University
**Kevin Lee**, Western Michigan University
**Hannah Waddel**, Emory University

### GSN Socials!

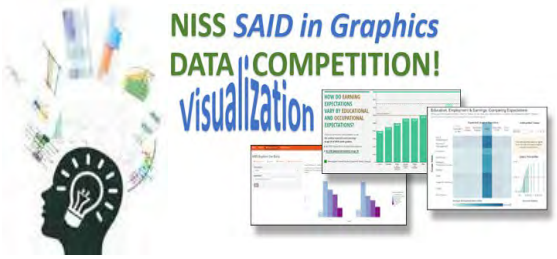
| | |
|---|---|
| 30 October | Fall Social |
| 19 November | Meeting with Alumni |
| 18 December | Holiday Social |
| 15 January | Meeting with Alumni |
| 12 February | Winter Social |
| 19 March | NISS Graduate Student Network Social |

## EARLY CAREER VIRTUAL SERIES

Panels, presentations and webinars for early career statisticians combine to form a series devoted to career fairs, to finding the first post-degree position, and to early experiences as a full-fledged member of the statistic's professional community. Attendance ranged from 55 to 100 (combined Career Fairs).

| | | Participants |
|---|---|---|
| 27 August | **Teaching Statistics Online: Approaches, Strategies & Technologies**<br>◆ Speakers: **John Haubrick,** Penn State University<br>◆ **Kristin Lynn Sainani**, Stanford University<br>◆ **Melinda Clardy**, South Louisiana Community College<br>◆ Moderator: **Esra Kurum**, University of California, Riverside | 100 |
| 11 November | **Academic Career Fair: Finding a Position During the Pandemic, Part 1**<br>◆ Speakers: **Kate Calder**, University of Texas, Austin<br>◆ **Abel Rodriguez**, University of Washington<br>◆ **Jiayang Sun**, George Mason University<br>◆ Moderator: **Lingzhou Xue**, Penn State University | 82 |
| 09 December | **Academic Career Fair: Finding a Position During the Pandemic, Part 2**<br>◆ Speakers: **Irina Gaynanova** and **Brani Vidakovic**, Texas A&M University<br>◆ **Robert Krafty**, Emory University<br>◆ **Martin Wells**, Cornell University<br>◆ Moderator: **Jessica Li** , University of California, Los Angeles | 48 |
| 12 March | **Government Career Fair - Spring 2021**<br>◆ Speakers: **Mika Cross**, Strategy@Work, LLC<br>◆ **Chris Haffer**, US Equal Employment Opportunity Commission<br>◆ **Lex Levin**, LexLevin, LLC<br>◆ Moderator: **Michael Jadoo**, Bureau of Labor Statistics | 55 |

## DATA VISUALIZATION COMPETITION




### Statistically Accurate Interactive Displays,...*In Graphics!*

In November 2020 NISS opened a competition for statistics and data science graduate students and quantitative methodology and socials science students to create innovative graphics for education data reports. Competitors aimed to demonstrate how interactive visualization can stimulate curiosity and prompt readers of various backgrounds to investigate substantive education questions more deeply.

| | | |
|---|---|---|
| **1st Place Individual:** | **Jingyi An** | Department of Data Science, Columbia University |
| **1st Place Team:** | **Kevin Bryant** | Department of Statistics, Penn State University |
| | **Dannielle Moriondo** | Department of Communications, Westminster College |
| **Judges Choice Award:** | **Aria Haji-Georgi** | Dept of Educational & Counseling Psychology, State Univ of NY, Albany |
| | **Oxana Rosca** | Dept of Educational & Counseling Psychology, State Univ of NY, Albany |
| | **Ching-Yen (Elie) Yu** | Dept of Educational & Counseling Psychology, State Univ of NY, Albany |
| | **Xinyun Xu** | Dept of Educational & Counseling Psychology, State Univ of NY, Albany |
| | **Falon Treis** | Department of Geography and Planning, SUNY Albany |

For each report, data were extracted to create an associated test data set. Graphics needed to be intuitively accurate and explicitly represent uncertainty. Submissions also included interpretation of graphics, and indicated how graphic expands data interpretation beyond graphic originally published in the selected report. Prizes were awarded in three categories: cross- disciplinary team, individual submission, and remarkable for creativity. The winning graphics were presented during JSM 2020 NISS Panel. Submissions were received from 11 cross-disciplinary teams and 68

## DATA VISUALIZATION COMPETITION CONT.

individuals. Industry experts served as judges, constructive comments were sent to each entrant, and three winners were identified and announced in May 2021. Students used applications such as R-Shiny, Tableau, and Python to display a variety of interactive graphics. Judges for the competition were drawn from expert panelists for the upcoming IES/NCES Expert Panel on *Innovative Graphics for Online NCES Reports*.

**Lee Wilkinson,** H2O and University Illinois at Chicago

**Dan Carr,** George Mason University

**Nola du Toit,** NORC and University of Chicago

**Jonathan Schwabish,** Urban Institute

## NISS 2020 WRITING WORKSHOP

### 7 & 14 August | 2020 NISS Writing Workshop for Junior Researchers NISS WW LINK

This year was special as the workshop was held virtually and included international participants who might not have been able to attend JSM in person. These two day-long sessions were held on August 7 and 14 following JSM to avoid conflict with the JSM program. The Writing Workshop provided instruction for writing journal articles and grant proposals. Each of the 27 participants submitted a recent writing sample, usually an early draft manuscript for an article or grant proposal. The senior mentor, a current or recent journal editor or program officer, was paired with the participant and provided a critique of the writing sample. Following a Virtual Group Lunch, each participant and personal mentor met to discuss the mentor's comments and to analyze writing habits and techniques to help the participant improve future writing. Four professional societies co-sponsored the 2020 Writing Workshop: ASA, ICSA, IMS, WNAR. A grateful *thank you* goes out to those who assisted in the Writing Workshop:

| | |
|---|---|
| **Naomi S. Altman**, PhD | Pennsylvania State University |
| **Emma K. T. Benn**, DrPH, MPH | Icahn School of Medicine at Mount Sinai |
| **Keith N. Crank**, PhD | NSF Program Director (retired) |
| **Cheryl L. Eavey**, PhD | National Science Foundation |
| **Susan S. Ellenberg**, PhD | University of Pennsylvania PSM |
| **Tim Hesterberg**, PhD | Google, Senior Statistician |
| **Xuming He**, PhD | University of Michigan |
| **Peter B. Imrey**, PhD | Cleveland Clinic |
| **Nicholas P. Jewell**, PhD | University of California, Berkeley |
| **Nicole Lazar**, PhD | University of Georgia |
| **Tyler H. McCormick**, PhD | University of Washington |
| **Karen Messer**, PhD | University of California, San Diego |
| **Edsel A. Peña**, PhD | University of South Carolina |
| **David M. Rocke**, PhD | University of California, Davis |
| **Hal S. Stern**, PhD | University of California, Irvine |
| **Huixia Judy Wang**, PhD | George Washington University |
| **Leland Wilkinson**, PhD | $H_2O$.ai & University of Chicago |
| **Jose Gabriel Huerta**, PhD | Sandia National Laboratories |
| **James H. Albert**, PhD | Bowling Green State University |
| **Roger L. Berger**, PhD | Arizona State University |
| **Ali Shojaie**, PhD | University of Washington |
| **Aleksandra B. Slavković**, PhD | Pennsylvania State University |
| **John Stufken**, PhD | University of North Carolina at Greensboro |

## NISS AFFILIATES

NISS Affiliates programming through the Affiliate Committee, chaired by **Dan Jeske** (Professor of Statistics and Vice Provost, UC Riverside), was an entirely virtual but comprehensive with a portfolio of conferences, workshops, town halls, and debates plus virtual events series. The NISS-Merck webinar series continued with more than 200 participants at each session. Other webinars drew in excess of 500 with international as well as national participation.

The Affiliates Committee developed two new virtual series to focus on important issues for statistics and data science. After partnering with ASA and ISI for two Town Halls on the data science challenges posed by COVID-19, NISS, with ASA, quickly followed with a Tutorial on epidemiological data modeling (SIR analysis). NISS co-organized the "COVID-19 Data Science" webinars with COPSS (Committee of Presidents of Statistical Societies) and its five charter member societies (ASA, ENAR, IMS, SSC, WNAR). These became a 13-part series on issues surrounding the epidemic, and the latest research in statistics, epidemiology and bioinformatics directed toward understanding the pandemic and its dynamics. Individual seminars presented data-driven research, information analysis and modeling as the basis for decision making in the efforts to combat COVID-19.

In a different direction, NISS created "Essential Data Science for Business," an 11-part webinar series in response to the question, "What do you think are the Top 10 key and practical data analytics methods that are in use in the business world today?" In the initial webinar, Victor Lo (Fidelity Investments and Member of NISS Board of Trustees) laid out the informed and authoritative foundations for the series, covering three categories: descriptive, predictive and prescriptive analytics. Each of the ten intensive three-hour tutorials considered a specific technology and included examples, projects and code-sharing. The debate format was continued for a broad professional audience with a further webinar discussion of p-values, their uses and misuses. A second lively debate argued the merits and roles of statistics versus data science for K-12.

The first CANSSI-NISS (Canada-US) Combined Institutes' Research Conference, was held in virtual mode in 2021.

NISS welcomed Auburn University, Department of Mathematics and Statistics, as a new NISS Affiliate. This brings the membership to a total of 37 Academic Affiliates, 6 Government Affiliates and 6 Industry Affiliates.

Affiliate Liaisons and Associate Liaisons (early career statisticians and researchers) have taken on many active roles in NISS, joining NISS committees, helping to organize NISS events, and leading NISS webinars and virtual conferences.

Membership allows Academic Affiliates to set aside half of the annual fee each year to support travel and conference funds for NISS-sponsored and co-sponsored Affiliate events. Academic Affiliates use these funds at their discretion to reimburse registration and travel expenses for conferences.

NISS co-sponsorship of Affiliate events allows these discretionary funds to be used to help defray conference costs. NISS advertises Affiliates co-sponsored conferences and includes follow-on reports on the NISS website and in the NISS Parameters Newsletters and Affiliate Updates. Affiliates Programs during this year were all virtual events and included topical series, conferences and career fairs with intended audiences at every career stage from student to seasoned researcher and experienced consulting statistician.

Highlights of Affiliates Programs follow.

## NISS BY THE NUMBERS

The past fiscal year saw the pace of our webinar's quicken, with well over 7,350+ participants active in the last 55 NISS-sponsored and 56 NISS-hosted events. 2020 saw NISS support 53 events and 2021 with 58. The reach of NISS continues to grow as the NISS Parameters Newsletter & Affiliates Update boasts an over 7,000-person circulation!

**LinkedIn**: The past fiscal year saw well over 80 posts help NISS to building 480+ connections and 490+ followers. NISS accumulated over 17K views, averaging around 200 views per post!

**Twitter**: From Jun. 1, 2020 to Dec. 31, 2020, NISS actively posted 128 tweets! Our NISS Twitter reached 320.54K total impressions (number of times a tweet is viewed) and gained 180 new followers!

**Facebook**: Activity on Facebook culminated in 58 posts and well over 3000 followers.

**YouTube**: NISS has accumulated quite a repository of recordings of NISS Events. Nearly all of the NISS videos are publicly available either through the NISS website / News, or more recently organized into Playlists on the NISS Communications YouTube Channel. The NISS YouTube channel contains 96 videos organized into 8 categories or playlists:

| | |
|---|---|
| 15 | COPSS-NISS COVID-19 Data Science Webinar Series |
| 16 | NISS Academic and Research Webinars |
| 11 | NISS-Merck Meet-Ups |
| 23 | Ingram Olkin Forum: Statistics Serving Society |
| 8 | Essentials Data Science for Business |
| 7 | Government Career Fairs |
| 7 | Industry Career Fairs |
| 7 | Academic Career Fairs |
| 13 | NISS-Merck Meet-Ups |

## ESSENTIAL DATA SCIENCE FOR BUSINESS SERIES

### *What are the Top 10 key & practical data analytics methods that are in use in the business world today?*

**Victor Lo**, Fidelity Investments & NISS Board of Trustee's member, opened the series with a comprehensive overview of ten topics that are proving to be essential methods in business. This "Top Ten" list is divided into three major categories: descriptive, predictive, and prescriptive analytics. While some of these topics are familiar in Statistics and Data Science graduate curricula, others are not regularly covered in most programs. The overview gave an informed and authoritative presentation of the major components for the tutorials to follow. Each tutorial in the series is presented as a 3-hour online tutorial. The first five topics were covered during sessions presented in 2020; the series continues in 2021 with the remaining five. All tutorials become part of the NISS library of video events, workshops and tutorials and remain accessible via the NISS website.

| | | Participants |
|---|---|---|
| 29 July | **Overview of Essential Data Science for Business** | 141 |
| 7 October | **Data Science Workflows** | 87 |
| 21 October | **Descriptive Analytics, Exploratory Data Analysis, & Data Visualization** | 107 |
| 4 November | **Predictive Analytics & Machine Learning** | 51 |
| 18 November | **Causal Inference & Uplift Modeling** | 43 |
| 2 December | **Deep Learning** | 37 |
| 10 February | **Unstructured Data Analysis - Text Mining with Tidy Data Principles** | 128 |
| 24 February | **Ethical Practice of Statistics and Data Science in the Social Sciences** | 33 |
| 10 March | **Domain Knowledge and Application Areas** | 28 |
| 24 March | **Non-Analytic Skills for Analytic Consulting Success** | 36 |
| 12 May | **Prescriptive Analytics and Optimization** | 23 |

## FIRST NISS-CANSSI HEALTH DATA SCIENCE WORKSHOP

The First CANSSI-NISS Health Data Science Workshop was virtually hosted by NISS on Zoom May 7 through 8, 2021. There were 248 statisticians and health data scientists from the U.S. and Canada that participated in a variety of thought- provoking and cutting-edge sessions on topics relating to exploring current approaches and new challenges being worked on for integrating Big Data in Health Data Science. The first day of this workshop started with the presentation of four short courses:

Short Course 1: **Yeying Zhu**, University of Waterloo, *An Introduction to Causal Inference*

Short Course 2: **Eric Laber**, Duke University, *Introduction to Reinforcement Learning in Precision Medicine*

Short Course 3: **Ming Li**, Amazon, *Deep Learning*

Short Course 4: **Rob Deardon**, University of Calgary, *Introduction to Disease Modeling*

The following two days of the workshop had distinguished Plenary Speakers. **Xiao-Li Meng** (Harvard University) focused on personalization of medicine and **Mary Thompson** (University of Waterloo) examined the interface of health data science and survey methods. Four well-known speakers gave presentations during the first invited session regarding their work on the statistical issues with COVID-19. The second invited session focused on causal inference for big health data. It was also announced that **Yujia Pan** a graduate student from the University of Michigan won the Poster Competition for Students and New Researchers.

| | | Participants |
|---|---|---|
| 6-8 May | **First CANSSI-NISS Health Data Science Workshop** | 248 |

## COPSS-NISS COVID-19 DATA SCIENCE WEBINAR SERIES


The COPSS-NISS COVID-19 Data Science webinar series is co-organized by the Committee of the Presidents of Statistical Societies (COPSS) and its five charter member societies (ASA, ENAR, IMS, SSC, and WNAR), as well as NISS. This bi-weekly seminar featured the latest research that is positioned on the cusp of new understanding and analysis of COVID-19 pandemic data, and promotes data-driven research and decision making to combat COVID-19.

With diverse topics and an outstanding lineup of speakers, this webinar series is one of the largest series NISS has co-sponsored producing 14 successful webinars which were heavily attended by participants coming from industry, academia and governmental sectors. This series in particular gained interest from the industry sector more than any other NISS event thus far. Participants ranged from over 40-1,000+ during this fiscal year.

| | | Participants |
|---|---|---|
| 3 December | **Inaugural COPSS-NISS Webinar on the Statistics of COVID-19 Vaccine Trials** | 1,034 |
| 17 December | **An Ecosystem for Tracking and Forecasting the Pandemic** | 284 |
| 7 January | **Using Epidemiologic Models to Reveal the Nature of Disease Transmission and Inform Decision-making** | 557 |
| 21 January | **Transmission Dynamics of SARS-CoV-2: Inference and Projection** | 203 |
| 4 February | **Host and Viral Genetics of SARS-CoV-2 to Enable Epidemiologic Surveillance, Clinical Insight and Pathobiology** | 118 |
| 18 February | **Misinformation and Attitude Formation Among the Canadian Public** | 78 |
| 4 March | **Predictions, Role of Interventions & the Crisis of Virus in India: A Data Science Call to Arms** | 72 |
| 1 April | **Pandemics, Poverty and Public Health** | 241 |

## COPSS-NISS COVID-19 DATA SCIENCE WEBINAR SERIES CONT.

| | | |
|---|---|---|
| 15 April | **Flying the Plane While Improving It - Learning from COVID Patient Data in Close to Real Time** | 115 |
| 29 April | **Communicating Statistics to Media: Highs and Lows During the Pandemic (so far)** | 155 |
| 13 May | **Communication of Statistical and Epidemiologic Concepts to Broad Audiences** | 189 |
| 27 May | **A Seat at the Table: The Key Role of Biostatistics and Data Science in the Pandemic** | 99 |
| 10 June | **Insights on Vaccine Hesitancy and Healthcare Inequity from a Survey of Millions of Individuals in the US and Worldwide** | 64 |

## NISS-MERCK VIRTUAL MEET-UP SERIES

| | | Participants |
|---|---|---|
| 16 September | **NISS-Merck Virtual Meet-up on Issues in Vaccine Development**<br>Speakers: **Ivan Chan**, AbbVie, Inc.<br>**Joshua Chen**, Sanofi Pasteur<br>**Marc Lipsitch**, Harvard University<br>Moderator: **Dan Holder**, Merck | 207 |
| 13 January | **NISS-Merck Meet-up on SARS-COV2 Vaccine Development**<br>Speakers: **Natalie Dean**, University Florida<br>**Jonathan Hartzel**, Merck<br>**Kert Viele**, Berry Consultants<br>Moderator: **Dan Holder**, Merck | 289 |
| 21 April | **NISS-Merck Meet-Up on Open Source Software in Pharma**<br>Speakers: **Andy Nicholls**, R Validation Hub, GSK<br>**Paul Schuette**, FDA-CDER<br>**Ted Lystig** and **Tarek Haddad**, Medtronic<br>Moderator: **Dan Holder**, Merck | 337 |

## NISS-ISI-ASA TOWN HALLS

American Statistical Association (ASA), International Statistical Institute (ISI), and the National Institute of Statistical Sciences (NISS) organized two town hall discussions to understand the breadth of the statistics community involvement at their local, state or national level in COVID-19 public health efforts. The town halls were an opportunity for participantsto share their work, find new connections, and ask questions. Additional Town Halls will be scheduled during 2021-2022. The final town halls will focus on modeling and contributions to public health.

| | | Participants |
|---|---|---|
| 17 July | **Town Hall - *Sampling & Registries***<br>**Kathy Ensor**, ASA President-Elect; Rice University<br>**John Bailer**, ISI President; Miami University | 102* |
| 24 July | **Town Hall - *Clinical Trials***<br>**Lisa LaVange**, University of North Carolina, Chapel Hill | 88* |

*Registrations

## NISS SPONSORED EVENTS

NISS Affiliates, through the Affiliates Committee planned one meet-up, 2 workshops, 2 debates, 3 forums, 5 tutorials, 3 career fairs, and 5 series of virtual events hosted by NISS. NISS also co-sponsored 53 events hosted by NISS Affiliates.

### 28 August | Data Science Conference on COVID-19 (230)

The conference showcased open-source technology and code used to model and analyze the COVID-19 pandemic and high- lighted best practices in replicable and reproducible science. Presentations explored epidemic models of the virus and the pandemics effect on the economy, transportation, the environment, the society and beyond.

NISS brought together three participants for this session who have extensive experience in statistics education, **Anna Bargagliotti**, (Loyola Marymount University), **Christine Franklin** (ASA and University of Georgia), and **Rob Gould** (UCLA). All three are members of the writing team of the GAISE Pre-K – 12 Guidelines for Assessment and Instruction in Statistics Education II Report, Bargagliotti and Franklin serving as co-chairs of this committee.

**Adam Grigg**
**Ajjit Narayanan**, **Vivian (Sihan) Zheng,** Urban Institute
**Alex Reinhart**, **Ryan Tibshirani**, Delphi Research Group
**Benjamin Ortiz Ulloa**, **Jesse Patsolic, Katherine Schulz, Kevin Kiernan**, **Margini Williner, Sophia Lam**, **Trevor G. Kent**, Accenture Federal Services
**Bennet Sakelaris**, **Laura Albrecht**, American Institute of Mathematics
**Caitlin Brown**, University of Manchester
**Caitlin Gorback**, National Bureau of Economic Research
**Catlin Power**, Labormatics, Inc.
**Changrong Ji**, A3
**Christian Morgenstern**, IPM Informed Portfolio Management
**Corbin Quick**, Harvard University
**David Corliss**, Peace-Work
**Dominic Russel**, New York University
**Eric Baron**, **Jun Yan, Nalini Ravishanker**, University of Connecticut
**Guannan Wang**, College of William & Mary
**Heping Zhang**, Yale University
**Jeff Morris**, **Jing Huang** University of Pennsylvania
**Jon Fintzi**, National Institute of Allergy & Infectious Diseases
**Jorge Romeu**, SUNY Cortland
**Joseph Friedman**, **Patrick Liu**, University of California, Los Angeles
**Julie Goulet**, Universität München
**Kwan-Yuet Ho**, **Robert Dunlap**, George Mason University
**Lee DeCola**, University of Maryland, Baltimore County
**Michael Baron**, American University
**Michael Falkenheim**, Congressional Budget Office
**Michael Jadoo**, Bureau of Labor Statistics
**Naomi Brownstein**, Moffitt Cancer Center
**Petra Zika**
**Philip Waggoner**, University of Chicago
**Qinxia Wang**, **Shanghong Xie**, **Szymon Sacher**, **Yuanjia Wang**, Columbia University
**Rebekah D. Jones**, Geographer
**Shirley Wang**, Bringham Hospital Harvard Medical School
**Shuang Jiang**, Southern Methodist University
**Sumedh Kaul**, Larkin Community Hospital
**Tejasv Bedi**, University of Texas, Dallas
**Tiffany Tang**, University of California, Berkeley
**Tom Shafer**, Elder Research, Inc.
**Varlam Kutateladze**, University of California, Riverside
**Yihui Xie**, R Studio
**Yilun Sun**, St. Jude Children's Research Hospital
**Yu Wang**, University of California, Berkeley

## DEEP LEARNING METHODS AND THEORY

PURDUE UNIVERSITY | Department of Statistics

NISS partnered with Purdue University's Department of Statistics for their *Distinguished Theme Seminar Series*:

| | |
|---|---|
| 28 August | **Lawrence Carin**, Duke University, *On Demystifying Adversarial Learning* |
| 4 September | **Heng Huang**, University of Pittsburgh, *Distributed Machine Learning* |
| 11 September | **Ying Nian Wu**, UC Los Angeles, *A Representational Model of Grid Cells Based on Matrix Lie Algebras* |
| 18 September | **Ruslan Salakhutdinov**, Carnegie Mellon, *Integrating Domain-Knowledge into Deep Learning* |

## DATA SCIENCE IN ACTION IN RESPONSE TO THE OUTBREAK OF COVID-19

In July, NISS wrapped up their sponsorship of the 14 ASA Section on Statistical Learning and Data Science and the Journal of Data Science's "Data Science in Action in Response to the Outbreak of COVID-19" webinar series, with the final 3 sessions in July.

## NISS SPONSORED EVENTS CONT.

### 15 October | The Statistics Debate! Part I: Shedding Light on the p-Value Controversies (760)

***Statisticians Debate Issues Central to Inference and Estimation***

**Jim Berger**, Duke University ♦ **Deborah Mayo**, Virginia Tech ♦ **David Trafimow**, New Mexico State University ♦ Moderator, **Dan Jeske**, University of California, Riverside

### 19 May | The Statistics Debate! Part II: Teaching Statistics vs. Data Science in Grades K-12? (167)

***Teaching Statistics vs. Data Science in Grades K-12?***

**Anna Bargagliotti**, Loyola Marymount University ♦ **Christine Franklin**, University of Georgia ♦ **Rob Gould**, University of California, Los Angeles ♦ Moderator, **Piaomu Liu**, Bentley University

## DATA SCIENCE CONFERENCE ON COVID-19


The Data Science Conference on COVID-19 showcased open source technology and code used to model and analyze the COVID-19 pandemic and highlighted best practices in replicable and reproducible science. Presentations explored epidemic models of the virus and the pandemics affect on the economy, transportation, the environment, the society and beyond.

This conference provided an opportunity for researchers to have their work reviewed and validated by their peers. In a push to encourage transparency, all presentations provided a link to the projects source code. Over 230 participants went.

## MATHEMATICAL FOUNDATIONS OF DATA SCIENCE


NISS co-sponsored a weekly online seminar on random topics on mathematical foundations of machine learning, statistics and optimization. Sponsored by Two Sigma, ETH Zurich, Georgia Institute of Technology, Harvard University, Northwestern University, Princeton University, Pennsylvania State University - Department of Statistics, ORAI China, Synced, and the National Institute of Statistical Sciences.

## ORANGE COUNTY ASA BIOSTATISTICS SYMPOSIUM SERIES

**23 October & 6 November |** NISS co-sponsored the ASA's Biostatistics Symposium webinar series that focused on applications of data science techniques and tools to statistical inference making. The webinar focused on various techniques such as machine learning methods, predictive biomarker algorithms, etc. in the area of biomedical sciences.

**Beth A. Lopour**, University of California, Irvine, *Translational Neuroscience: Data, Methods and Potential Impact for Statistical Analysis* ♦ **Alice Chen**, Edwards Lifesciences, *Using R-Shiny in Navigating THV Studies* ♦ **Sophia Yang**, AbbVie, *VBA Macro Utility to Facilitate Creating ADaM Specification and Define.xml*

## MYLES HOLLANDER DISTINGUISHED LECTURESHIP


**30 November |** The Department of Statistics at Florida State University opened their new lecture series with inaugural speaker **Nancy Reid, PhD**, University Professor, Canada Research Chair, Statistical Methodology, University of Toronto. "*Three R's - Reliability, Replicability, Reproducibility: The Interplay between Statistical Science and Data Science*."

# STATISTICS SERVING SOCIETY ($S^3$) FORUMS

NISS organized the Ingram Olkin Forum series on the theme Statistics Serving Society focusing on current societal issues that might benefit from new or renewed attention from the statistical community. These forums aim to introduce the latest innovations in statistical methodology and data science into new research and public policy collaborations, working to accelerate the development of innovative approaches that impact societal problems. During this year, forums addressed the consequences of COVID-19 on medical research and on schools and learning, examined the role of AI in social equity, and research directions to inform understanding and remediation of excessive use of force by police.

## Unplanned Clinical Trial Disruptions IOF Series

The IOF Committee developed a six-part virtual series on the impact of COVID-19 via unanticipated disruption of clinical medical research, the final two parts to be held in 2021. These online forums brought together statistical leaders from government agencies, clinical trial practitioners, and expert methodological statisticians to define the statistical issues presented by each aspect of trial disruption. Speakers from the regulatory agencies opened the initial two events. Following each session, working groups formed to collaborate on white papers or manuscripts for publication.

LINK TO IOF SERIES WEBSITE

| | | Participants |
|---|---|---|
| 21 July | **NIH Perspectives** | 171 |
| 28 July | **CDC, FDA, and EMA Perspectives** | 149 |
| 1 September | **Estimands & Missing Data** | 26 |
| 15 September | **Randomization Tests** | 34 |
| 23 March | **Coping with Information Loss and the Use of Auxiliary Sources of Data** | 31 |
| 27 April | **Bayesian and Frequentist Approaches to Rescuing Disrupted Trials** | 47 |

### 25 September | Algorithmic Fairness & Social Justice LINK (158)

**Kush Varshney**, IBM, *Trustworthy Machine Learning and Artificial Intelligence*
**Kristian Lum**, UPenn, *Fairness, Accountability & Transparency: (Counter)-examples from Predictive Models in Criminal Justice*
**Alexandra Chouldechova**, CMU, *Affected Community Perspectives on Algorithmic Decision-Making in Child Welfare Services*

### 16 December | COVID and the Schools: Modeling Openings, Closings, and Learning Loss LINK (156)

**Stephen Sawchuk**, Education Week, *Schools, COVID 19, and Instructional Plans*
**Brian Gill & Ravi Goyal**, Mathematica, *Operating Schools in a Pandemic: Predicted Effects of Opening, Quarantining, and Closure Strategies*
**Cliff Kerr & Dina Mistry**, IDM, *Time to Go Back to School? Using Agent-Based Modeling to Inform COVID 19 Decision Making*
**Megan Kuhfeld**, NW Evaluation Assoc., *Impact of Missing Data: Our Understanding of Academic Progress During COVID-19 Pandemic*
**Julia Kaufman & Claude Messan Setodji**, RAND, *American Educator Panels: Providing K 12 Educator Perspectives on COVID-19*

### 4 June | Police Use of Force LINK (113)

**Dean Knox**, University of Pennsylvania, *The Need for a General Causal Framework to Study Police Violence*
**Robin Engel**, University of Cincinnati, *Understanding the Impact of De-Escalation During Police-Civilian Interactions: Developing a Comprehensive Research Framework for Police Reform*
**Travis Riddle**, National Police Foundation, *Why Don't We Know More About Officer-Involved Shootings?*

### IOF Committee Members:

| | | | | |
|---|---|---|---|---|
| **Nancy Flournoy** (Chair) | **David Banks** | **Betsy Becker** | **Michael Brundage** | **Megan Glenn** |
| **Claire Kelling** | **James Rosenberger** | **Jerry Sacks** | **Christopher Schmid** | **Lingzhou Xue** |

# NISS AT THE 2020 JOINT STATISTICAL MEETINGS (JSM)

## 3 August | Statistical Issues of Gun Safety and Opioid Epidemic — Invited Panel

Panelists: **Stephanie Lanza**, Penn State University
**Sally Morton**, Virginia Tech
**James Rosenberger**, National Institute of Statistical Sciences & PSU
**Erica Smith**, Bureau of Justice Statistics

Chair: **Nancy Flournoy**, University of Missouri, Columbia • Organizer: **Lingzhou Xue**, NISS & PSU

## 4 August | Data and Challenges for Unraveling Gun Violence

**Elizabeth Stuart** Johns Hopkins BSPH, *An Overview of Statistical Issues (and Opportunities) in Studying Gun Violence*
**Greg Ridgeway** Univ of Pennsylvania, *The Role of Individual Officer Characteristics in Police Shootings Presentation*
**Yifan Zhang** Stanford University, *Which Handgun Owners are at Highest Risk of Suicide*
**John MacDonald** Univ of Pennsylvania, *Place-Based Field Experiments to Test Gun Violence Reduction Strategies*

Chair: **James Rosenberger**, NISS & PSU • Organizer: **Jana Lynn Asher**, Slippery Rock University

## 6 August | Session in Honor of Jerome Sacks

**Alan F. Karr** AFK Analytics, LLC, *Jerry Sacks' Role at NISS*
**Max Morris** Iowa State University, *Creation of a New Area of Statistics: Computer Experiments*
**William Welch** University of British Columbia, *The Early Years: Paving the Way for Computer Experiments*

Discussant: **Jerome Sacks**, National Institute of Statistical Sciences

Organizer: **Clifford H. Spiegelman**, Texas A&M University • Chair: **Doug G Simpson**, University of Illinois, Urbana Champaign

## 8 August | NISS at 30: Highlights from the Early Years and Emerging Trends

NISS at 30: Highlights from the Early Years and Emerging Trends (JSM Session 271 NISS News)

Panelists: **David Banks**, Duke University & SAMSI, *The Workshop that Started It All and, Later, the SAMSI-NISS Nexus*

**Nancy Flournoy**, University of Missouri, *1984-2018: From Ingram Olkin's first vision to the NSF Cross-Disciplinary Report to NISS to the Ingram Olkin Fund*

**Daniel Jeske**, University of California, Riverside, *The NISS Affiliates and the Affiliates Program Highlights*

**Nell Sedransk**, National Institute of Statistical Sciences, *NISS at 30, From Past to Future*

**Jerome Sacks**, National Institute of Statistical Sciences

Chair: **Jim Rosenberger**, NISS & PSU; Organizer: **Lingzhou Xue**, NISS & PSU

The history of NISS from its beginnings to 2000 and the establishment of SAMSI is recounted in the NISS Timeline and the *NISS: From Vision to National Institute* historical article.

Link to the Ingram Olkin Fund

# NISS AT THE 2020 JOINT STATISTICAL MEETINGS (JSM) CONT.

## NISS Presentations

*Empirical Data-Fusion Approaches to Generate Model Covariates*
**Sartore, L.**, Abernethy, J., Boryan, C., **Chen, L.**, Hunt, K., **Spiegelman, C.**, Young, L. J.

*Early Season Planted Acreage Estimates using Machine Learning*
Abernethy, J., Boryan, C., Hunt, K., **Sartore, L.**

*Classifying Evolving Data Streams*
Toppin, K., **Sartore, L.**

*The Impact of Writing Prompts on the Writing Performance of English Language Learners*
**Mo, Y.**, Deng, Q., Wright, K., & **Sedransk, N.**

*Hierarchical Bayesian Model with Inequality Constraints for Planted Acreage Estimates*
**Chen, L.**

*Crop Classification and Uncertainty Assessment at 10-M Resolution using Google Earth Engine*
**Sartore, L.**, Boryan, C.

*Early Season Planted Acreage Estimates using Machine Learning*
Abernethy, J., Boryan, C., Hunt, K., **Sartore, L.**

*Hierarchical Bayesian Model with Inequality Constraints for County-Level Estimates.*
**Chen, L.**, NASS, NISS; Nandram, B., Worcester Polytechnic Institute; Cruze, N.B., NASS, USDA

*Faster Computation for Hierarchical Bayesian Models with RCPP Packages*
**Chen, L.**

*Dancing Distributions: Developing a Better Understanding of County-Level Crop Yield from Posterior Summaries*
Cruze, N.B., NASS, USDA; **Chen, L.**, USDA, NISS; Nandram, B., Worcester Polytechnic Institute; Guindin, N., USDA National Agricultural Statistics Service

*With the COVID-19 Pandemic making the 2020 JSM virtual, the traditional annual NISS/SAMSI Reception and the NISS Affiliates Luncheon at JSM were sidelined until we can safely meet in-person again.*

## SENIOR FELLOWS AND SENIOR MENTORS

**Jerome Sacks**
Director Emeritus
NISS 1991-2000

**Alan F. Karr**
Director Emeritus
NISS 2000-2014

**Jay Breidt**
Senior Fellow
Colorado State U

**Bruce Craig**
Senior Fellow
Purdue

**Steven Glazerman**
Senior Fellow
Mathematica

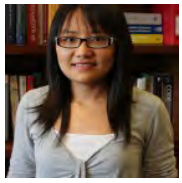
**Rod Little**
Senior Fellow
U Michigan

**Peter Meyer**
Senior Fellow
NORC U Chicago

**Jean Opsomer**
Senior Fellow
Colorado State U

**Nathaniel Schenker**
Senior Fellow
Retired (NCHS)

**Erin Schliep**
Research Fellow
U Missouri



**Yajuan Si**
Research Fellow
U Michigan

**Jim Harner**
(1945 – 2021)
Senior Fellow
West Virginia U

**S. Lynne Stokes**
Senior Fellow
S. Methodist U

**Xia Wang**
Research Fellow
U Cincinnati

**Christopher Wikle**
Senior Fellow
U Missouri

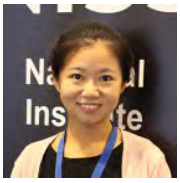
**Recai M. Yucel**
Senior Fellow
U at Albany

## RESEARCH ASSOCIATES AND FELLOWS

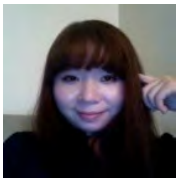
*"A different perspective of what type of problems to tackle and how to tackle them. In that sense it had a profound long-term effect on my career."*

**Alexi Albert**

**Alexandra Brown**



**Lu Chen**



**Ya Mo**

**Luca Sartore**

**Zach Turner**

*"Be part of an interdisciplinary team . . . team-based research makes the statistician an equal player at the table and recognizes the intellectual contributions."*

## FUNDING SOURCES

- NASS
- NCES
- NSF
- Affiliates - Fees
- Workshops
- NC Building Rental

## DONATIONS

https://www.niss.org/about/contribute-niss

- Cash donations were received and often matched by corporations and organizations with matching policies.
- Donations in kind were also received in the form of software and services from organizations and individuals.

## INGRAM OLKIN FUND (IOF) DONATIONS

The Ingram Olkin Fund accepts donations to be used for IOF events. In addition to donations during 2019-2020, a grant to support Impact of the Opioid Epidemic was deferred until 2021 when the conference was postponed due to COVID-19.

## AUDIT

In the second half of each fiscal year, **Mark S. Danes**, auditor who specializes in non-profit organizations, conducts a formal audit of NISS financial activities. The audit then passes to the Finance Committee and on to the full Board of Trustees and Members of the Corporation at the annual meeting in November. NISS received a completely clean audit of 2019-2020 in the fall of 2020 and again a completely clean audit of 2020-2021 (NISS Financial Statement on page 33 & 34) was received in fall of 2021.

## PARTNERS

Professional societies, universities, industry and other groups co-sponsored and provided partial support for NISS events and workshops.

### Professional Societies

ASA ◆ ENAR ◆ ICSA ◆ IISA ◆ IMS ◆ KISS ◆ SSC ◆ WNAR ◆ ASA Statistics in Epidemiology Section

### Industry and Government Partners

Merck ◆ BLS ◆ Google ◆ SAS

### Academic Organizations

Pennsylvania State University ◆ University of Connecticut

### Institutes

SAMSI ◆ CANSSI

## STATEMENT OF ASSETS, LIABILITIES AND NET ASSETS

# National Institute of Statistical Sciences
## Statement of Activities
## June 30, 2021 and 2020

| | 2021 | 2020 |
|---|---|---|
| **Without donor restrictions** | | |
| Support and Revenue | | |
| Contracts and grants | $ 1,559,170 | 1,227,936 |
| Rental income | 471,012 | 351,154 |
| Affiliates program | 89,840 | 84,465 |
| Donations | - | 288,000 |
| Workshops revenue | 41,663 | 47,069 |
| Miscellaneous income | 618 | 607 |
| Total support and revenue | 2,162,303 | 1,999,231 |
| Net assets released from restriction | | |
| Expiration of purpose restrictions- Sacks Award | 1000 | 1000 |
| Expiration of time restrictions- Affiliates | 34,000 | 50,500 |
| Total support, revenue and reclassifications | 2,197,303 | 2,050,731 |
| Expenses | | |
| Program Services | 1,138,809 | 1,053,407 |
| Management and general | 452,481 | 522,683 |
| Cost of rental income | 445,654 | 305,806 |
| Total Expenses | 2,036,944 | 1,881,896 |
| Change in net assets with donor restrictions | 160,359 | 168,835 |
| **With donor restrictions** | | |
| Affiliates program | 23,500 | 32,500 |
| Net assets released from restrictions | | |
| Expiration of purpose restrictions- Sacks Award | (1,000) | (1,000) |
| Expiration of time restrictions- Affiliates | (34,000) | (50,500) |
| Change in net assets with donor restrictions | (11,500) | (19,000) |
| Change in net assets | 148,859 | 149,835 |
| Net assets at beginning of year | 3,739,640 | 3,589,805 |
| Net assets at end of year | $ 3,888,499 | $ 3,739,640 |

## STATEMENT OF ASSETS, LIABILITIES AND NET ASSETS CONT.

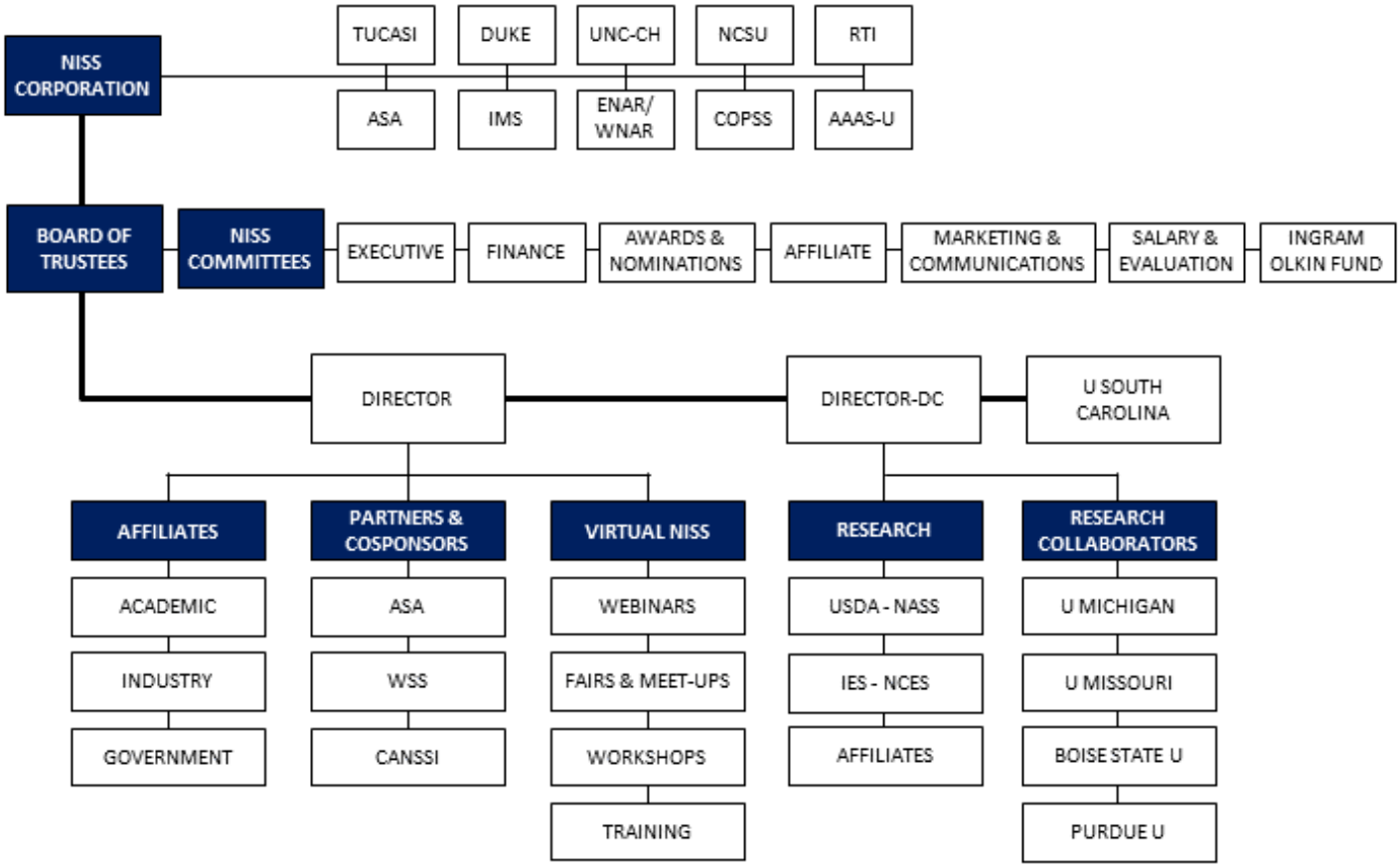
# National Institute of Statistical Sciences
## Statement of Financial Position
## June 30, 2021 and 2020

| | 2021 | 2020 |
|---|---|---|
| Assets | | |
| Cash and cash equivalents | $ 579,718 | $ 369,219 |
| Contracts and grants receivable | 312,308 | 188,007 |
| Other receivables | 100 | 1,000 |
| Rent receivable | 163,421 | 161,254 |
| Prepaid expenses | 21,769 | 12,347 |
| Security deposits | 5,400 | 5,400 |
| Lease closing costs, net | 153,094 | 174,109 |
| Property and equipment, net | 5,382,191 | 5,564,939 |
| Total assets | $ 6,618,001 | $ 6,476,275 |
| Liabilities and Net Assets | | |
| Accounts payable | $ 137,132 | $ 58,987 |
| Accrued expenses | 48,666 | 18,649 |
| Deferred revenue | 124,149 | 115,061 |
| Long-term debt | 2,419,555 | 2,543,938 |
| Total liabilities | $ 2,729,502 | $ 2,736,635 |
| Net Assets | | |
| Without donor restrictions | $ 2,499,985 | $ 2,339,626 |
| With donor restrictions | 1,388,514 | 1,400,014 |
| Total net assets | $ 3,888,499 | $ 3,739,640 |
| Total liabilities and net assets | $ 6,618,001 | $ 6,476,275 |

# APPENDICES

## APPENDIX A

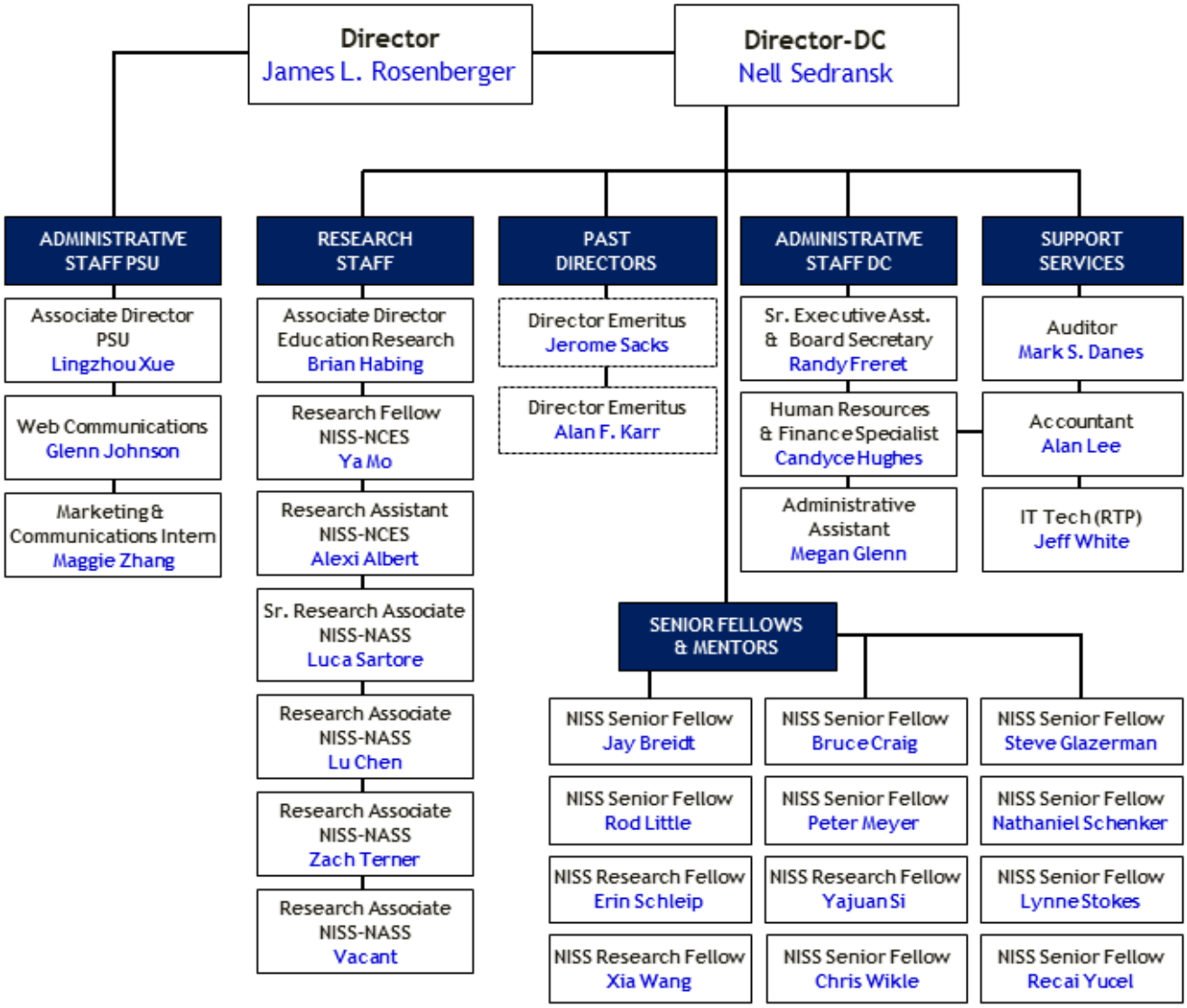
# NISS ORGANIZATION CHART




**Structural Chart**
As of June 30, 2021
**National Institute of Statistical Sciences**

## APPENDIX A

# NISS ORGANIZATION CHART




Organizational Chart

As of June 30, 2021

National Institute of Statistical Sciences

## APPENDIX B

# NISS GOVERNANCE

https://www.niss.org/people/board-of-trustees

| Members of the Corporation | Members of the NISS Board | Elected Members of the NISS Board of Trustees |
|---|---|---|
| AAAS Section U | **Nicholas Jewell**, UC, Berkeley | **Raymond P. Bain**, Chair, Merck |
| ASA | **Ronald L. Wasserstein**, ASA | **Christy Chuang-Stein**, Vice Chair |
| COPSS | **Mimi Kim**, Albert Einstein | **Tim Hesterberg**, Google |
| Duke University | **Jerry Reiter**, Duke | **Gabriel Huerta**, Sandia |
| IMS | **James Booth**, Cornell | **Phil Kott**, RTI |
| NCSU | **Alyson Wilson**, NCSU | **Victor S.Y. Lo**, Fidelity |
| RTI International | **Steve Cohen**, RTI | **Bhramar Mukherjee**, U Michigan |
| TUCASI | **Scott Levitan**, RTF | **Victoria Stodden**, U Illinois, U-C |
| UNC-CH | **Jan Hannig**, UNC-CH | **Leland Wilkinson**, H2O.ai |
| ENAR/WNAR | **Kate Crespi**, UCLA | **Sam Woolford**, Bentley |
| | | **Tommy Wright**, Census Bureau |

# NISS BOARD OF TRUSTEES COMMITTEES FOR 2020-2021

**EXECUTIVE**: **Raymond Bain** (Chair), **Christy Chuang-Stein** (Vice-Chair), **Mary Batcher**, **James Booth**, **Tim Hesterberg**, **Gabriel Huerta**, **Bhramar Mukherjee**, **Hal Stern**, **Leland Wilkinson**, **James Rosenberger** (Ex-Officio), **Nell Sedransk** (Ex- Officio)

**AFFILIATES**: **Christy Chuang-Stein** (Chair), **Nathan Cruze**, **Joel Dubin**, **Harold Gomes**, **Dan Holder**, **Dan Jeske**, **Glenn Johnson**, **Mimi Kim**, **Phil Kott**, **Esra Kurum**, **Victor Lo**, **Sam Woolford**, **Lingzhou Xue**, **James Rosenberger** (Ex-Officio)

**AFFILIATES - RECRUITING & RETENTION**: **Sam Woolford** (Chair), **Lingzhou Xue**, **James Rosenberger** (Ex-Officio)

**AWARDS & NOMINATIONS**: **James Booth** (Chair), **Christy Chuang-Stein**, **Tim Hesterberg**, **Hal Stern**, **James Rosenberger** (Ex-Officio)

**COMMUNICATIONS & MARKETING**: **Tim Hesterberg** (Chair), **Richard Zink**, **Jan Hannig**, **Dan Holder**, **Nell Sedransk**, **Ron Wasserstein**, **Randy Freret**, **Glenn Johnson** (Ex-Officio)

**FINANCE**: **Mary Batcher** (Chair), **Ray Bain**, **Ed Cohen**, **Ron Wasserstein**, **Alyson Wilson**, **James Rosenberger** (Ex-Officio), **Candyce Hughes** (Ex-Officio), **Nell Sedransk** (Ex-Officio), **Alan Lee** (Consultant)

**INGRAM OLKIN FUND**: **Nancy Flournoy** (Chair), **David L. Banks**, **Larry Hedges**, **Tim Hesterberg**, **Claire Kelling**, **Sally Morton**, **James Rosenberger**, **Jerry Sacks**, **Allan Sampson***, **Christopher Schmid**, **Lingzhou Xue, Megan Glenn**

**SALARY & EVALUATION**: **Raymond Bain** (Chair)

* In Memoriam

## APPENDIX C

# NISS AFFILIATES

### ACADEMIC

Albert Einstein College of Medicine, Division of Biostatistics
Arizona State University, School of Mathematics and Statistical Sciences
Auburn University, Department of Mathematics and Statistics
Baylor University, Department of Statistical Science
Bentley University, Department of Mathematical Sciences
Clemson University, School of Mathematical and Statistical Sciences
Columbia University, Department of Statistics
Cornell University, Department of Statistics and Data Science
Duke University, Department of Statistical Science
Emory University, Department of Biostatistics and Bioinformatics
Florida State University, Department of Statistics
George Mason University, Department of Statistics
Georgetown University, Department of Biostatistics, Bioinformatics and Biomathematics
Iowa State University, Department of Statistics
Ohio State University, Department of Statistics
Pennsylvania State University, Department of Statistics
Purdue University, Department of Statistics
Rice University, Department of Statistics
Southern Methodist University, Department of Statistical Science
Texas A&M University, Department of Statistics
University of California, Riverside, Department of Statistics
University of California at Los Angeles, Department of Biostatistics
University of California at Los Angeles, Department of Statistics
University of Georgia, Department of Statistics
University of Illinois Urbana-Champaign, Department of Statistics
University of Kentucky, Department of Statistics
University of Minnesota-Twin Cities, Department of Statistics
University of Michigan, Department of Biostatistics
University of North Carolina at Chapel Hill, Department of Statistics and Operations Research
University of North Carolina in Greensboro, Department of Mathematics and Statistics
University of Pennsylvania, Wharton School, Department of Statistics
University of Pennsylvania, PSM, Department of Biostatistics, Epidemiology & Informatics
University of Pittsburgh, Department of Statistics
University of South Carolina, Department of Statistics
University of Texas at Austin, Department of Statistics and Data Sciences
Western Michigan University, Department of Statistics

### GOVERNMENT AGENCIES & NATIONAL LABORATORIES

Bureau of Labor Statistics
Energy Information Administration
National Agricultural Statistics Service
National Center for Education Statistics
National Security Agency
U.S. Census Bureau

### INDUSTRY

Google
Merck & Co., Inc.
Minitab, Inc.
RTI International
SAS Institute, Inc.

## APPENDIX D

# NISS HOSTED EVENTS

## 2020

| | | Participants |
|---|---|---|
| 21 July | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions Day 1 | 171 |
| 28 July | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions Day 2 | 149 |
| 29 July | Essential Data Science for Business – Overview | 141 |
| 7 & 14 August | NISS Writing Workshop for Junior Researchers (at JSM) | 27 |
| 27 August | Teaching Statistics Online: Approaches, Strategies & Technologies | 100 |
| 1 September | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions - Estimands & Missing Data | 26 |
| 15 September | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions - Randomization Tests | 34 |
| 16 September | NISS-Merck Virtual Meet-up on Issues in Vaccine Development | 307 |
| 25 September | Ingram Olkin Forum: Algorithmic Fairness & Social Justice | 158 |
| 7 October | Essential Data Science for Business: Data Science Workflows | 87 |
| 15 October | The Statistics Debate! | 760 |
| 21 October | Essential Data Science for Business: Descriptive Analytics, Exploratory Data Analysis, & Data Visualization | 107 |
| 30 October | NISS Affiliate Graduate Student Networking Event: Fall Social | |
| 4 November | Essential Data Science for Business: Predictive Analytics & Machine Learning | 51 |
| 11 November | Fall 2020 Virtual Academic Career Fair - Finding a Position During the Pandemic | 82 |
| 18 November | Essential Data Science for Business: Causal Inference & Uplift Modeling | 43 |
| 19 November | NISS Affiliate Graduate Student Networking Event: Meeting with Alumni | |
| 30 November | NISS Academic Affiliate Meetup: How to Present Your Research | 76 |
| 2 December | Essential Data Science for Business: Deep Learning | 37 |
| 3 December | COPSS-NISS COVID-19 Data Science Webinar Series | 1,034 |
| 9 December | Fall 2020 Virtual Academic Career Fair: Finding a Position During the Pandemic, Part 2 | 48 |
| 16 December | NISS Ingram Olkin Forum: COVID & the Schools: Modeling Openings, Closings, and Learning Loss | 156 |
| 17 December | COPSS-NISS COVID-19 Data Science Webinar Series | 284 |
| 18 December | NISS Affiliate Graduate Student Networking Event: December Social | |

## APPENDIX D

# NISS HOSTED EVENTS

## 2021

| | | Participants |
|---|---|---|
| 7 January | COPSS-NISS COVID-19 Data Science Webinar Series: Using Epidemiologic Models to Reveal the Nature of Disease Transmission and Inform Decision-making | 557 |
| 13 January | NISS-Merck Meet-up on SARS-COV2 Vaccine Development | 289 |
| 15 January | NISS Graduate Student Network Event: Meeting with Alumni | |
| 21 January | COPSS-NISS COVID-19 Data Science Webinar Series: Transmission Dynamics of SARS-CoV-2: Inference and Projection | 203 |
| 4 February | COPSS-NISS COVID-19 Data Science Webinar Series: Host and Viral Genetics of SARS-CoV-2 to Enable Epidemiologic Surveillance, Clinical Insight and Pathobiology | 118 |
| 10 February | Essential Data Science for Business: Unstructured Data Analysis - Text Mining with Tidy Data Principles | 128 |
| 12 February | NISS Graduate Student Network Event: Winter Social | |
| 18 February | Government Career Fair - Spring 2021 | 78 |
| 24 February | Essential Data Science for Business: Ethical Practice of Statistics and Data Science in the Social Sciences | 33 |
| 4 March | COPSS-NISS COVID-19 Data Science Webinar Series: Predictions, Role of Interventions and the Crisis of Virus in India: A Data Science Call to Arms | 72 |
| 10 March | Essential Data Science for Business: Domain Knowledge and Application Areas | 28 |
| 12 March | Government Career Fair - Spring 2021 | 55 |
| 18 March | How to Negotiate a Job Offer (NISS & GSN) | 142 |
| 19 March | NISS Graduate Student Network - Social | |
| 23 March | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions | 31 |
| 24 March | Essential Data Science for Business: Non-Analytic Skills for Analytic Consulting Success | 36 |
| 30 March | Toolkit for the Modern Statistician, NISS-GSN | 115 |
| 1 April | COPSS-NISS COVID-19 Data Science Webinar Series: Pandemics, Poverty and Public Health | 241 |
| 15 April | COPSS-NISS COVID-19 Data Science Webinar Series: Flying the Plane While Improving It – Learning from COVID Patient Data in Close to Real Time | 115 |
| 21 April | NISS-Merck Meet-Up on Open Source Software in Pharma | 337 |
| 27 April | Ingram Olkin Forum Series: Unplanned Clinical Trial Disruptions - Day 6 | 47 |
| 29 April | COPSS-NISS COVID-19 Data Science Webinar Series: Communicating Statistics to the Media: Highs and Lows During the Pandemic (so far) | 155 |
| 6-8 May | First CANSSI-NISS Health Data Science Workshop | 248 |
| 12 May | Essential Data Science for Business: Prescriptive Analytics and Optimization | 23 |
| 13 May | COPSS-NISS COVID-19 Data Science Webinar Series: Communication of Statistical and Epidemiologic Concepts to Broad Audiences | 189 |
| 19 May | The Statistics Debate II: Teaching Statistics vs. Data Science in Grades K-12? | 167 |
| 27 May | COPSS-NISS COVID-19 Data Science Webinar Series: A Seat at the Table: The Key Role of Biostatistics and Data Science in the Pandemic | 99 |
| 4 June | Ingram Olkin Forum: Police Use of Force | 113 |
| 10 June | COPSS-NISS COVID-19 Data Science Webinar Series: Insights on Vaccine Hesitancy and Healthcare Inequity from a Survey of Millions of Individuals in the US and Worldwide | 64 |
| 12-13 June | NISS Graduate Student Research Conference | 34 |
| 24 June | COPSS-NISS COVID-19 Data Science Webinar Series: Airborne Transmission of the Virus SARS-CoV-2 | 44 |

## APPENDIX D

# NISS CO-SPONSORED EVENTS

## 2020

| | |
|---|---|
| 2 July | Webinar Series: Mathematical Foundations of Data Science |
| 7 July | Webinar Series: Mathematical Foundations of Data Science |
| 10 July | Webinar Series: Data Science in Action in Response to the Outbreak of COVID19 |
| 17-24 July | ASA, ISI, & NISS Town Halls on COVID-19 |
| 17 July | Webinar Series: Data Science in Action in Response to the Outbreak of COVID19 |
| 24 July | Webinar Series: Data Science in Action in Response to the Outbreak of COVID19 |
| 11 August | Webinar Series: Deep Learning Methods & Theory |
| 18 August | Webinar Series: Deep Learning Methods & Theory |
| 25 August | Webinar Series: Deep Learning Methods & Theory |
| 28 August | Data Science Conference on COVID-19 [DSCC-19] |
| 28 August | Webinar Series: Deep Learning Methods & Theory |
| 1 September | Webinar Series: Mathematical Foundations of Data Science |
| 4 September | Webinar Series: Deep Learning Methods & Theory |
| 11 September | Webinar Series: Deep Learning Methods & Theory |
| 11 September | Webinar Series: Mathematical Foundations of Data Science |
| 15 September | Webinar Series: Mathematical Foundations of Data Science |
| 18 September | Webinar Series: Deep Learning Methods & Theory |
| 18 September | Webinar Series: Mathematical Foundations of Data Science |
| 2 October | Webinar Series: Mathematical Foundations of Data Science |
| 9 October | Webinar Series: Mathematical Foundations of Data Science |
| 16 October | Webinar Series: Mathematical Foundations of Data Science |
| 23 October | 2020 Orange County ASA Biostatistics Symposium Series |
| 23 October | Webinar Series: Mathematical Foundations of Data Science |
| 30 October | Myles Hollander Inaugural Distinguished Lecturer Series |
| 30 October | Webinar Series: Mathematical Foundations of Data Science |
| 6 November | Webinar Series: Mathematical Foundations of Data Science |
| 13 November | Webinar Series: Mathematical Foundations of Data Science |
| 17 November | Webinar Series: Mathematical Foundations of Data Science |
| 4 December | Webinar Series: Mathematical Foundations of Data Science |

## APPENDIX D

# NISS CO-SPONSORED EVENTS

## 2021

| | |
|---|---|
| 15 January | Webinar Series: Mathematical Foundations of Data Science |
| 22 January | Webinar Series: Mathematical Foundations of Data Science |
| 29 January | Webinar Series: Mathematical Foundations of Data Science |
| 5 February | Webinar Series: Mathematical Foundations of Data Science |
| 12 February | Webinar Series: Mathematical Foundations of Data Science |
| 26 February | Webinar Series: Mathematical Foundations of Data Science |
| 5 March | Webinar Series: Mathematical Foundations of Data Science |
| 19 March | Webinar Series: Mathematical Foundations of Data Science |
| 26 March | Analytics Without Borders Conference 2021 |
| 26 March | Webinar Series: Mathematical Foundations of Data Science |
| 2 April | Webinar Series: Mathematical Foundations of Data Science |
| 9 April | Webinar Series: Mathematical Foundations of Data Science |
| 12 April | 13th Annual Conference on Statistical Issues in Clinical Trials: Cluster Randomized Clinical Trials (CRTs): Challenges and Opportunities |
| 14 April | Virtual Career Fair for Non-Clinical Biostatistics (NCB) |
| 16 April | Webinar Series: Mathematical Foundations of Data Science |
| 23 April | Webinar Series: Mathematical Foundations of Data Science |
| 29 April | ASA Virtual Mentoring Round Table |
| 30 April | Webinar Series: Mathematical Foundations of Data Science |
| 8 May | Women in Data Science Initiative - Regional Event |
| 17-19 May | The Statistical Methods in Imaging Conference 2021 |
| 21 May | Webinar Series: Mathematical Foundations of Data Science |
| 4 June | Webinar Series: Mathematical Foundations of Data Science |
| 11 June | Webinar Series: Mathematical Foundations of Data Science |
| 18 June | Webinar Series: Mathematical Foundations of Data Science |
| 21-24 June | 2021 Nonclinical Biostatistics Conference: Nonclinical Statistics in the Age of Data Science |
| 28 June - 1 July | USCOTS 2021: Expanding Opportunities |

## APPENDIX E

# NISS NCES REPORT LIBRARY

| YEAR | DATE | TITLE |
|---|---|---|
| 2021 | March | Setting Priorities for Federal Data Access to Expand the Context for Education Data |
| 2021 | January | Innovative Graphics for NCES Online Reports |
| 2020 | December | Post COVID Surveys |
| 2020 | March | Release of Process Data to Researchers |
| 2019 | October | Making NCES Process Data Available |
| 2019 | March | Improving SES Estimators |
| 2018 | June | Taking a Longitudinal View of Administrative Education Data |
| 2018 | March | Clear Data Descriptions in NCES Reports |
| 2018 | January | Study and Survey Recruitment Planning and Materials |
| 2018 | January | Roundtable on Imputation in Government Surveys |
| 2017 | January | Study Design for Postsecondary Sample Surveys |
| 2017 | March | New Approach for Sampling Education Surveys |
| 2016 | December | Integrity, Independence, and Innovation: The Future of NCES |
| 2014 | August | Secure Statistical Analysis of Distributed Data |
| 2012 | January | Comparable Wage Index |
| 2011 | March | Configuration and Data Integration for Longitudinal Studies |
| 2011 | February | Confidentiality - Data Swapping |
| 2010 | December | Emerging Issues in Postsecondary Access and Choice |
| 2009 | July | Full Population Estimates for NAEP |
| 2008 | January | Capturing the Conditions and the Impacts of Technology on US K-12 Education |
| 2008 | January | Effect Size |
| 2008 | January | Non-Response Bias Analysis |
| 2008 | January | Computer Adaptive Testing for Longitudinal Studies |
| 2001 | December | Disclosure Risk vs. Data Utility: The R-U Confidentiality Map |
| 1999 | February | Accounting for Missing Data in Educational Surveys |

## APPENDIX F

# PUBLICATIONS

## 2021

Chan, A., Okolo, C. T., **Terner, Z.**, Wang, A. (2021). "The Limits of Global Inclusion in AI Development." *AAAI 2021 Workshop* - Reframing Diversity in AI: Representation, Inclusion and Power.

**Chen, L.**, Nandram, B., Cruze, N. B. (2021). "Hierarchical Bayesian Model with Inequality Constraints for US County Estimates". *Journal of Official Statistics*. To appear.

**Chen, L.**, Nandram, B. (2021). "A Hierarchical Bayesian Beta-Binomial Model for Sub-Areas." Book: *Modern Age Statistics to Recent Advances in Applied Statistics*. Springer Nature. To appear.

**Mo, Y.**, Carney, M., Cavey, L. & Totorica, T. (2021). "Using Think-Alouds for Response Process Evidence of Teacher Attentiveness." *Journal of Applied Measurement in Education, 34* (1), 10-26.

Young, L., **Rodhouse, J.**, **Terner, Z.**, Corral, G. (2021, June 14-17). "Adopting Previously Reported Data into the 2022 Census of Agriculture: Lessons Learned from the 2020 September Agricultural Survey." [Book chapter]. *Sixth International Conference on Establishment Statistics 2021*, Virtual Conference.

Williams, N., Beauchemin, J., Giuntini, G., Griffis, J., **Mo, Y.** (2021). "Psychometric Evaluation of a Pragmatic Measure for Assessing Adherence to System of Care Principles in Behavioral Health Service Interactions." To appear.

## 2020

**Sartore, L.**, **Wei, Y.**, Abayomi, E., Riggins, S., Corral, G., Bejleri, V., **Spiegelman, C.** (2020). "Modeling Swine Population Dynamics at a Finer Temporal Resolution." *Applied Stochastic Models in Business and Industry*, 36(6), 1060-1079.

**Terner, Z.**, Franks, A. (2020). "Modeling Player and Team Performance in Basketball." *Annual Review of Statistics and Its Application 8*.

**Terner, Z.**, et al. (2020). "Seasonal and Secular Trends of Cardiovascular, Nutritional, and Inflammatory Markers in Hemodialysis Patients." *Kidney 360*. 10-34067.

### SUBMITTED MANUSCRIPTS

Abernathy, J., Boryan, C., Hunt K., **Sartore, L.** (2021). "Preseason Planted Acreage Estimates Using Cost Sensitive Machine Learning." Manuscript under review.

**Mo, Y.**, **Sedransk, N.**, **Albert, A.** (2021). "Getting a Clear Picture of Students' Writing Performance." Manuscript under review.

**Mo, Y.**, **Sedransk, N.**, **Habing, B.** (2021). "Tree-based Methods: A Tool for Modeling Nonlinear Complex Relationships and Generating New Insights from Data." Manuscript under review.

**Sartore, L.**, Boryan, C., Johnson, D. M., **Chen, L.**, Seiffrin, R. (2021). "Combining Remote Sensing and Survey Data for Enhancing Early Season Crop Acreage Estimates." Manuscript under review.

**Si, Y.**, **Little, R.**, **Mo, Y.**, **Sedransk, N.** (2021). "Nonresponse Bias Analysis in Cross-sectional Studies: A Case Study with the ECLS-K 2011 Study. Manuscript under review.

# APPENDIX F

# PRESENTATIONS

## PRESENTATIONS

**Chen, L.** (2020, August). Hierarchical Bayesian Model with Inequality Constraints for Planted Acreage Estimates.Presentation at the meeting of the virtual JSM 2020.

**Sartore, L.**, Abernethy, J., Boryan, C., **Chen, L.**, Hunt, K., **Spiegelman, C.**, Young, L. J. (2020, August). Empirical data-fusion approaches to generate model covariates. Presentation at the meeting of the virtual JSM 2020.

Cruze, N.B., **Chen, L.**, Guindin, N. and Nandram, B. (2020, August) Dancing Distributions: Developing a Better Understanding of County-Level Crop Yield from Posterior Summaries. Presentation at the meeting of the virtualJSM 2020.

**Chen, L.** (2020, September). Hierarchical Bayesian Model with Inequality Constraints for County-Level Estimates.Presentation at the GSS/SSS/ASA Practicum on Blended Data.

**Chen, L.** (2020, October). Faster Computation for Hierarchical Bayesian Models with Rcpp Packages. Presentationat Virtual Seminar for ASA-WPI Student Chapter.

Cruze, N. B., **Chen, L.** (2021, May) Implementation of model-based estimates in support of the USDA NASS cropscounty estimates program. Presentation at the University of Maryland Research Interaction Team on Small Area Estimation.

Cruze, N. B., **Chen, L.,** Johanson, J., Pordugal, T. (2021, May) Implementation of model-based estimates in supportof the USDA NASS crops county estimates program. Presentation at 2021 Conference on Applied Statistics in Agriculture and Natural Resources.

**Chen, L.** (2021, June). Transitioning to Model-Based Official Statistics: The Case of Crops County Estimates.Presentation at the Sixth International Conference on Establishment Statistics (ICES VI).

**Sartore, L.**, Boryan, C. 2020. Crop classification and uncertainty assessment at 10-m resolution using Google Earth Engine(GASP) Virtual conference. USA.

Abernethy, J., Boryan, C., Hunt, K., **Sartore, L.** (2020). Early season planted acreage estimates using machine learning (JSM) Virtual conference. USA.

Toppin, K., **Sartore, L.** (2020). Classifying evolving data streams (JSM) Virtual conference. USA.

Rodhouse, J., Ridolfo, H., **Terner, Z.**, McGovern, P. (2021). *Interview Length, Rest Period, and Response Likelihood in Establishment Surveys.* [Conference presentation]. Sixth International Conference on Establishment Statistics (ICES VI) 2021, Virtual Conference.

# APPENDIX F

# AWARDS

## NASS PROJECTS

### Lu Chen:

**RDD SPOT Award, 7/2020**
Citation: For incorporating calibration approach into the estimation process of the Farm Labor project.

**NASS Collaborator of the Year Award, 4/2021**
Citation: For outstanding contribution on improving the estimation processes for Farm Labor and Crops County Estimates programs, producing more efficient and transparent crops county estimates with CVs, and reducing the burden of the field office review.

***Farm Labor Team* Circle Award, 4/2021**
Citation: For implementing new Farm Labor statistics requested by the Secretary of Agriculture.

***County Estimates Modeling Implementation Team* Circle Award, 4/2021**
Citation: For implementing modeling approaches into production of official county estimates while demonstrating a high level of customer service from multiple divisions. This translates into the cost savings in terms of staff hours, improves the efficiency and quality of NASS products, and positively affects data users both within and outside the government.

### Luca Sartore:

***Farm Labor Team* Circle Award, 4/2021**
Citation: For implementing new Farm Labor statistics requested by the Secretary of Agriculture.

### Zach Turner:

***Achievement Award*, 6/6021**
Citation: For exceptional efforts on the Non-Edited Respondent Data team the June Area ResearchProject, and the Sigma projects, furthering important ongoing research, while exhibiting teamwork and creativity.

## NCES RESEARCH

### Ya Mo:

**Boise State University E-Campus Online Research Fellowship**
**NISS Research Fellow:** *Using Reflection as a Self-Assessment Tool for Online Learning*.

## APPENDIX G

# SPEAKERS GALLERY

## NISS VIRTUAL CAREER FAIRS

November 11, 2020
**Finding a Position During the Pandemic, Part 1**

**Lingzhou Xue** Moderator | **Kate Calder** | **Abel Rodriguez** | **Jiayang Sun**

December 9, 2020
**Finding a Position During the Pandemic, Part 2**

**Jessica Li** Moderator | **Irina Gaynanova** | **Brani Vidakovic** | **Robert Krafty** | **Martin Wells**

March 18, 2021
**How to Negotiate a Job Offer**

**Esra Kurum** Moderator | **Richard De Veaux** | **Galin Jones** | **Bhramar Mukherjee**

March 31, 2021
**Toolkit for the Modern Statistician**

**Analisa Flores** Moderator | **Mine Cetinkaya-Rundel**

March 12, 2021
**Securing a Position in the Federal Government**

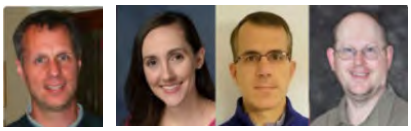
**Michael Jadoo** Moderator | **Mika Cross** | **Chris Haffer** | **Lex Levin**

## NISS-MERCK VIRTUAL MEET-UP SERIES

September 16, 2020
**Issues in Vaccine Development**

**Dan Holder** Moderator | **Ivan Chan** | **Joshua Chen** | **Marc Lipsitch**

January 13, 2021
**SARS-COV2 Vaccine Development**



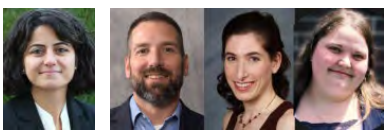
**Dan Holder** Moderator | **Natalie Dean** | **Jonathan Hartzel** | **Kert Viele**

January 13, 2021
**Open Source Software in Pharma**

**Dan Holder** Moderator | **Andy Nicholls** | **Paul Schuette** | **Ted Lystig** | **Tarek Haddad**

## NISS RESEARCH WEBINAR SERIES

August 27, 2020
**Teaching Statistics Online: Approaches, Strategies and Technologies**



**Esra Kurum** Moderator | **John Haubrick** | **Kristin Lynn Sainani** | **Melinda Clardy**

## APPENDIX H

# NISS STAFFING

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