

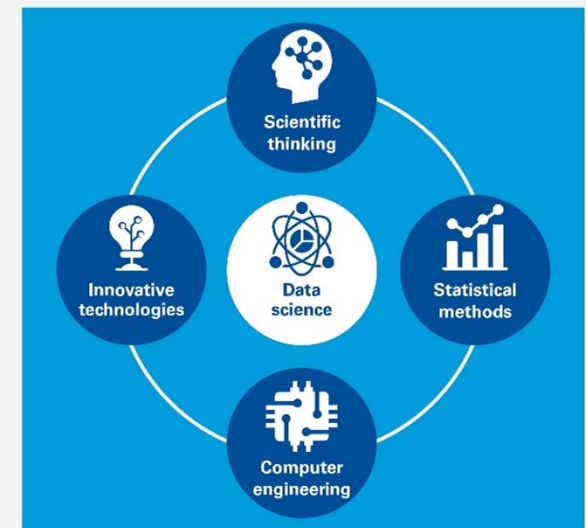
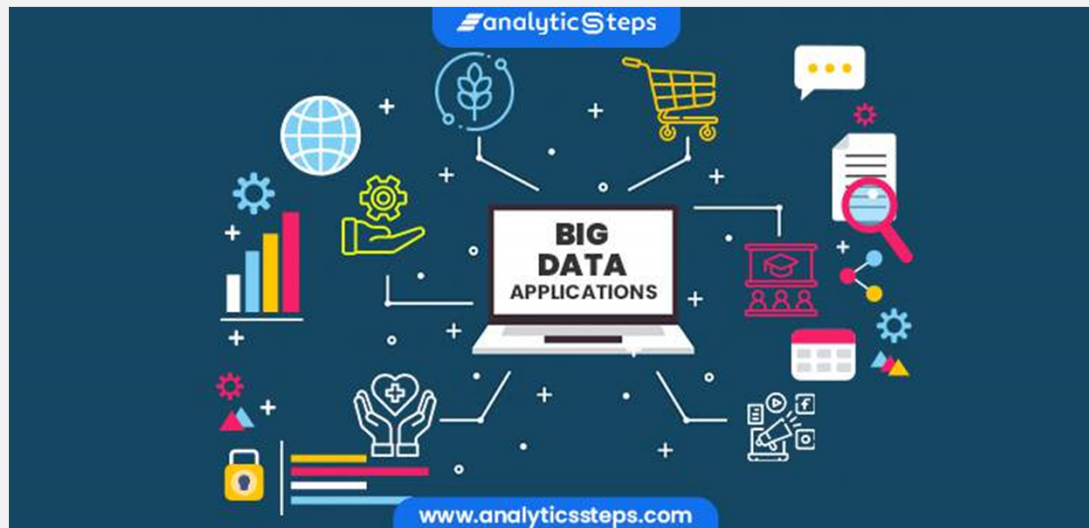
# NCSU Statistics Graduate Program Review

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## Why Consider a Statistics Graduate Program

- It's a great time to be doing graduate studies in statistics!
- The era of “big data” and “data science” is very exciting for statisticians. Statistical skills are more than ever in demand.



## NCSU Statistics Graduate Program

- **Founded by renowned statistician, Gertrude Cox in 1941**
- **One of the nation's oldest and prestigious departments**
- **Statistics Graduate Program ranks #16 nationally** <https://www.usnews.com/best-graduate-schools>



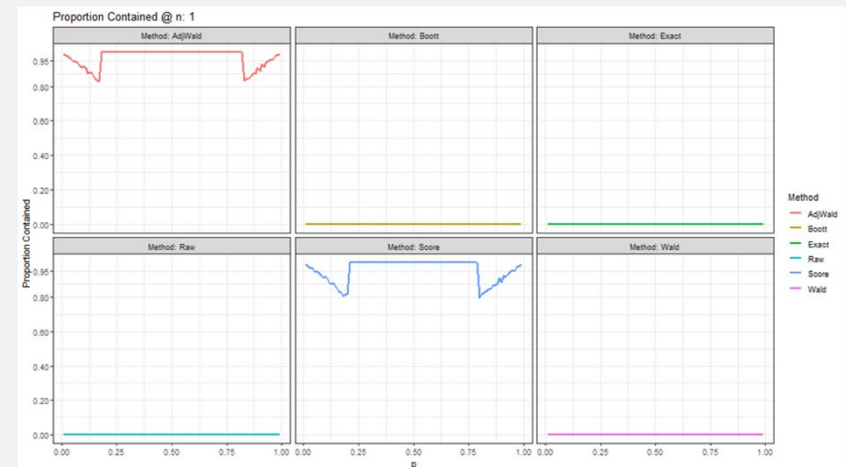
## NCSU Statistics Graduate Program

- **Consists of:**
  - **PhD program**
  - **In-person master's program with various concentrations**
  - **Online master's program**
  - **Graduate Certificate in Applied Statistics and Data Management**
- **PhD program takes about five years and a master's degree can be earned along the way**
- **Master's programs (generally non-thesis):**
  - **In-person can be done in one year**
  - **Online can take anywhere from one to four years**



## Why Consider Our Graduate Program

- Receive comprehensive and rigorous training in foundational and cutting-edge statistical theory, methodology, and applications
- Learn state-of-the-art computing skills for conducting high-quality interdisciplinary research



### Linear Regression

#### Cross Validation Results

RMSE	Rsquared	MAE
260.69	0.64	177.02

#### ANOVA output for selected model

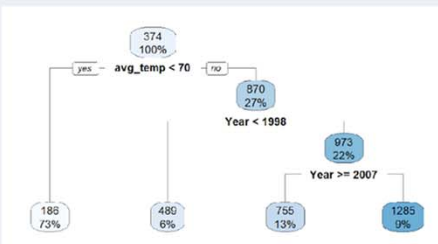
	Df	Sum.Sq	Mean.Sq	F.value	Pr..F.
avg_temp	1	26311822.78	26311822.78	433.82	0.00
drought_severity	1	34358.95	34358.95	0.57	0.45
avg_precip	1	42112.92	42112.92	0.69	0.41
Year	1	117277.21	117277.21	1.93	0.17
Month	11	2429368.93	220851.72	3.64	0.00
Residuals	243	14738238.53	60651.19	NA	NA

### Regression Tree

#### Cross Validation Results

cp	RMSE	Rsquared	MAE
0.07	263.22	0.62	183.98

#### Regression Tree Plot

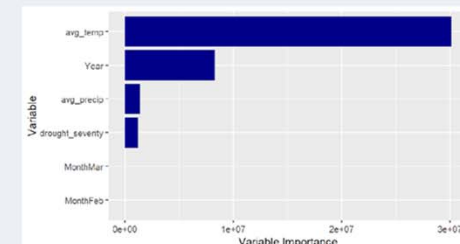


### Random Forests

#### Cross Validation Results

mtry	RMSE	Rsquared	MAE
25.00	179.24	0.81	122.53

#### Variable Importance Plot



## Why Consider Our Graduate Program

- **Our students are prepared for a very wide set of careers in statistics, biostatistics, data science, etc.**
- **We have industry partners that provide many graduate industrial traineeships (GITs)**
- **A huge alumni network (over 1000 alumni!)**
- **Friendly and supportive department & staff that wants you to succeed!**
  - **Student mentors**
  - **Active student clubs, government, reading groups, and intramural sports**
  - **Department socials**



**Alison McCoy**  
Department Receptionist



**Lanakila Alexander**  
Graduate Program  
Coordinator



**Donna Barton**  
Online Program  
Coordinator

## Career Placement

**Graduates have excellent job placement!**

- **Academic (faculty positions, post-doc)**
- **Federal Government (FDA, EPA, Census Bureau, etc.)**
- **Financial Industries (BOA, Wells Fargo, etc.)**
- **IT Industries (Google, Facebook, Amazon, Apple, etc.)**
- **Pharmaceutical Industries (Novartis, Merck, Pfizer, Lilly, etc.)**
- **Clinical/Contract Research Organizations (IQVIA, PPD, etc.)**
- **Software Companies (SAS, RStudio, RedHat, etc.)**
- **Sports (USA Baseball, LA Dodgers, Philadelphia Eagles)**

## Program Prerequisites

**All programs are competitive!**

- **Multivariate calculus (calculus III) & linear algebra are required for the master's and PhD**
- **For PhD applicants, real analysis (MA425) is highly recommended but not required**
- **Graduate certificate only requires an undergraduate degree (GPA > 3.0)**
- **GRE is NOT required for any program**





## Master's Program Information

- **Geared toward preparing graduates for industry**
- **Applied program with computing infused in every course**
- **30 credit hours required (10 courses) – no thesis**
- **Core courses:**
  - **Fundamentals of Statistical Inference I & II**
  - **Fundamentals of Linear Models**
  - **Applied Statistical Methods I & II**
- **Other required courses:**
  - **An in-depth statistical computing course (R, SAS, or Python options)**
  - **Statistical practice (capstone course)**
- **Many electives to choose from to suit your interests**

## Online Master's Program Information

- **Same degree as the in-person master's**
- **Courses are all taught by our full-time faculty**
- **Online students have access to the same professors, lectures, and assessments as our on-campus students**
  
- **Courses follow semester calendars but are asynchronous as to provide flexibility for work and family obligations**
  - **Instructor and teaching assistant office hours & problem sessions via zoom**
  - **Discussion boards**
  - **Slack channels**
- **Access to all NC State resources**
- **Enroll in any semester**



## **In-Person Master's Program**

- **Summer enrollment (domestic students only) & Fall enrollment (domestic & international students)**
- **Can complete in one year (May-to-May or Aug-to-Aug)**
- **Generally, no financial support**
- **If your goal is to pursue PhD eventually, you should apply for PhD program or consider the PhD track master's program!**

## PhD Program

- **Fall enrollment only**
- **GSSP benefits (4 years for students with a master in statistics; 5 years for students without a master in statistics):**
  - Covers tuition and health benefits
- **Funding support:**
  - Teaching Assistantships (TAs)
  - Research Assistantships (RAs)
  - Fellowships (SAS, SAMSI, Provost, training grant, etc.)
  - Graduate Industrial Traineeships (GITs)

## Diverse Faculty Research

- **Bayesian Inference**
- **Bioinformatics and Statistical Genetics**
- **Biostatistics**
- **Computational Statistics**
- **Functional Data Analysis**
- **High-Dimensional Data**
- **Machine Learning**
- **Precision Medicine and Causal Inference**
- **Sports Statistics**
- ...
- **No need to choose right away!**

Limiting coverage

Theorem

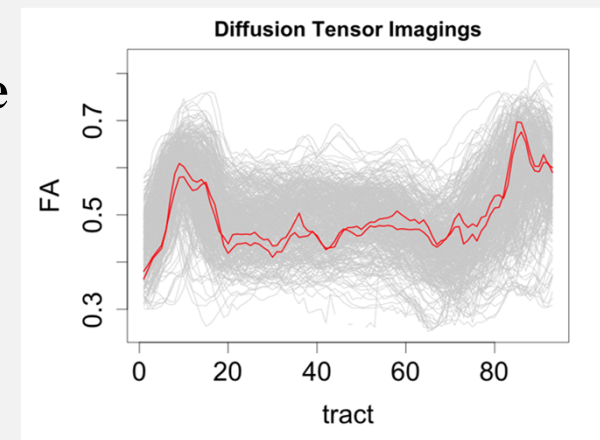
(a) for every  $z \in \mathbb{R}$ ,  $F_n^*(z|D_n) \rightsquigarrow F_{a,b}^*(z|W_1)$ ;

(b) the distribution of  $F_{a,b}^*(0|W_1)$  is symmetric about  $1/2$ ;

(c) the limiting coverage of  $I_{n,\gamma}$  is characterized as follows:

$$P_0(f_0(x_0) \in I_{n,\gamma}) \rightarrow P\left(\frac{\gamma}{2} \leq P(\Delta_{W_1, W_2}^* \geq 0 | W_1) \leq 1 - \frac{\gamma}{2}\right).$$

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## Milestones

- **PhD Qualify Exam**
- **Written Prelim Exam**
- **Oral Prelim Exam**
- **Final Oral Exam (PhD Defense)**



## **Graduate Student Experiences**

**Kera Whitley - Recent online Master's program graduate. Looking to enter the bio-manufacturing/analytics area.**

**Sergio Mora - Current online Master's program student and Senior CX Data Analyst at Vanguard.**

**Grace Rhodes - 4th year PhD student. Working with Drs. Marie Davidian and Wenbin Lu in developing advanced machine learning tools for dynamic prediction of mean residual lifetime using electronic medical records (EMR) data.**

**Jimmy Hickey - 3rd year PhD student. Working with Drs. Jon William and Emily Hector in transfer learning with applications in hospital intensive care units (ICU).**

## Application Logistics

- **Online application:**  
<https://statistics.sciences.ncsu.edu/graduate/application-process/>
  - ✓ **Personal statement**
  - ✓ **Transcripts**
  - ✓ **Three letters of recommendation**
  - ✓ **Resume or CV**
- **PhD application deadline: December 15 (priority)**
  - Decisions will be made in early Jan. to late March
- **In-person master's application deadline: January 15 (priority); March 25 (final)**
  - Decisions will be made in March to May
- **Online master's application deadline: Fall semester – July 30; Spring semester – December 15; Summer semester – April 30**
  - Applicants can begin any semester



# Questions?

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