



North Carolina  
School of Science  
and Mathematics



# NCSSM Economic & Social Contribution

White Paper | 2020



# Table of Contents

- 1 Executive Summary**
- 3 Introduction**
  - 3 About NCSSM
  - 4 Economic and Social Contribution Study
- 4 NCSSM Alumni as Contributors to NC Economy and Communities**
  - 5 Alumni Survey Response Overview
  - 6 Demographics of Survey Participants
  - 7 Educational Attainment and University Attendance
  - 10 Careers, Earnings, and Innovation
  - 12 Community Contributions
- 13 NCSSM's Operational and Capital Expenditures  
IMPLAN Analysis**
  - 13 NCSSM-Durham IMPLAN Method
  - 13 NCSSM-Durham IMPLAN Results
- 14 NCSSM-Morganton Construction and Projected  
Operating Contribution**
- 16 References & Acknowledgements**
  - 16 Contact



## Executive Summary

### NCSSM Graduates Show High Levels of Educational Attainment of Bachelor's and Graduate Degrees

- 98% of graduates earn a bachelor's degree, and about 65% of NCSSM college graduates earn a degree in a STEM field, nearly three times the national average.
- **74% of all NCSSM graduates report that they have earned or are currently seeking a master's or doctorate degree**, which is over five times the national average for adults in the United States and nearly twice that of those who have earned a bachelor's degree.

### Most NCSSM Graduates Remain in NC for College and the Majority Remain in the UNC System

- 69% of NCSSM graduates earned a bachelor's degree from a UNC System school, with a majority attending NC State and UNC-Chapel Hill.
- **78% of NCSSM graduates earned their degree at either a public or private institution in North Carolina, retaining these talented students in the state.**

### NCSSM Alumni Earn STEM Degrees at a High Rate and in High-Wage and High-Demand Fields

- An analysis of alumni degree fields shows that, **about 64% of NCSSM college graduates earn a bachelor's degree in a STEM field** and 67% earn at least one bachelor's or graduate degree in a STEM field, over three times the national average.
- Over half of NCSSM STEM degrees are earned in the fields of engineering (24%) and biological sciences (28%) followed by physical sciences (15%), computer and information sciences (11%), health professions (10%), and mathematics and statistics (9%).

### Most NCSSM Alumni are High-Wage Earners and Over Half are Employed in North Carolina

- **With an average annual personal income of \$110,000, the 54% of NCSSM alumni who remain** in-state stand to earn over \$653 million each year.
- Applying an economic multiplier effect to the estimated annual in-state alumni earnings of over \$653 million, indicates the potential for NCSSM alumni to contribute over \$1.3 billion of economic activity in earnings and spending in North Carolina each year.

## NCSSM Alumni are Employed in High-Wage and High-Demand Fields with Wide Responsibility and Leadership

- The top five fields in which alumni are employed include the sectors of computer and information sciences, business and management, education, medicine, and engineering. Several of these fields are both high-wage and high-demand jobs in North Carolina and nationally.
- 55% of alumni are employed in STEM related fields which is nearly four times the national average.
- Of the NCSSM alumni who participated in the survey and are currently working full-time, **67% reported that they have wide or total responsibility at their jobs, which indicates that alumni take on important leadership roles in organizations.**

## NCSSM Students and Alumni Provide Leadership and Important Contributions to their Communities

- Over the last forty years, NCSSM students have contributed over 660,000 hours in service to North Carolina communities.
- **68% of alumni reported that they have served in a leadership role in their community**, including serving as an officer or on a committee for a local club, organization or place of worship, serving on a local government board or commission, running for political office, working on a political campaign for a candidate or cause, or serving on the board of a non-profit organization.
- 40% agreed that their community service experience at NCSSM directly inspired them to improve their community as an adult.
- 30% of NCSSM alumni have taught or plan to teach in STEM fields, passing on knowledge and experiences gained at NCSSM and beyond to the next generation.

## NCSSM's Expansion and Operating Expenditures Contribute to Economic Activity in North Carolina and the Unifour Region

- The total NCSSM-Durham annual operating expenditure and economic contribution is about \$46 million and supports about 420 jobs in North Carolina.
- More than \$81 million will be invested during the design and construction of the Morganton campus.
- Annual operating spending in Burke County will be roughly \$11.5 million and **this number would be estimated to double to roughly \$23 million of statewide impact including direct, indirect, and induced effects.**
- Opening the Morganton campus will support nearly 400 construction jobs and create nearly 100 permanent staff and faculty jobs in Western NC.
- While the NCSSM-Morganton construction and operating contributions will impact the state as well as the Unifour region, **perhaps the greatest contribution of this investment over time will be in supporting an initial increase of 300 NCSSM residential students as well as increased distance learning and summer program/enrichment opportunities** as an investment in leaders and skilled workforce contributing to the state of North Carolina, the nation, and the world.

# Introduction

## About NCSSM

[North Carolina School of Science and Mathematics \(NCSSM\)](#) challenges academically talented students from across the state with a comprehensive curriculum including highly specialized courses in science, technology, engineering/computer science, and mathematics. NCSSM opened in 1980 as something of an academic experiment: Would something excellent happen if we gathered together a highly motivated and diverse student body with a critical mass of equally motivated, accomplished, credentialed, and diverse faculty within a space dedicated to the power of the scientific method? Four decades later, NCSSM has built a firmly rooted reputation as an academic powerhouse, educating intellectually gifted students from every corner of the state, representing rural and urban communities, and all socioeconomic and ethnic backgrounds. **Eleven states and several countries worldwide have since used NCSSM as the model for their own programs.**

Today, as in 1980, the mission of NCSSM, an intellectually stimulating, diverse, inclusive, and collaborative community, is to:

- educate and nurture academically talented students to become state, national, and global leaders,
- increase access to high quality public education in North Carolina, and
- cultivate engaged citizens who will work for the betterment of the world,

through challenging programs, with an emphasis on STEM, driven by the pursuit of excellence and innovation.

**Altogether, nearly 1,500 North Carolina students from all 13 congressional districts and nearly all 100 counties are enrolled in one of our three signature programs:** our residential diploma program, our online certificate program or our Open Enrollment Distance Education program. Our Open Enrollment courses, taught via interactive video conferencing, expand local offerings to include enrichments and advanced coursework otherwise unavailable in students' home communities. NCSSM instructors teach live to classrooms statewide daily, broadcasting more synchronous video than any other public provider in the state. By 2022, NCSSM will expand to an additional campus in Morganton, NC. Funded primarily by the Connect NC Bond, the campus will initially accommodate 300 additional residential diploma program students as well as increased distance education enrollment.

Though a UNC constituent institution, NCSSM operates as a free public high school open to qualified NC students, regardless of financial means. We generate nearly 10 percent of our institutional budget from private sources, a ratio that will likely increase during our next comprehensive fundraising campaign. **NCSSM has over 11,000 alumni who continue to serve as leaders in the state, nation, and world.** Our school's three founders — former North Carolina Governor James B. Hunt Jr., senator and Duke University President Terry Sanford; and academician and author John Ehle — envisioned an institution that would invest in the state's human and intellectual capital to build leadership and economic progress.

## Economic and Social Contribution Study

In this study we sought to further understand the contribution of NCSSM and its alumni to North Carolina and beyond. The study addressed the following research questions:

- 1 What educational and career paths do NCSSM alumni follow?
- 2 What are the average earnings of NCSSM alumni, and to what extent do their earnings contribute to economic activity in North Carolina?
- 3 What contributions do NCSSM alumni make in terms of entrepreneurship and innovation?
- 4 What social and community contributions do NCSSM alumni make both within and outside their local communities?
- 5 How do operating expenditures and campus expansion of the North Carolina School of Science and Mathematics contribute to the economy of North Carolina?

The methods and data that have been used to address these purposes and overall research questions included an economic contribution analysis of the school's existing operating budget and Morganton expansion on the North Carolina economy using an IMPLAN input-output model and current construction budgets and job creation figures. We also conducted a survey in spring of 2019 of all NCSSM alumni who attended the school between the opening of the school in 1980 and 2018. The survey included questions related to:

- Alumni commitment to STEM (degrees and employment);
- Alumni earnings, entrepreneurship and innovation;
- Alumni commitment to North Carolina;
- Social impact of NCSSM alumni; and
- The NCSSM Experience

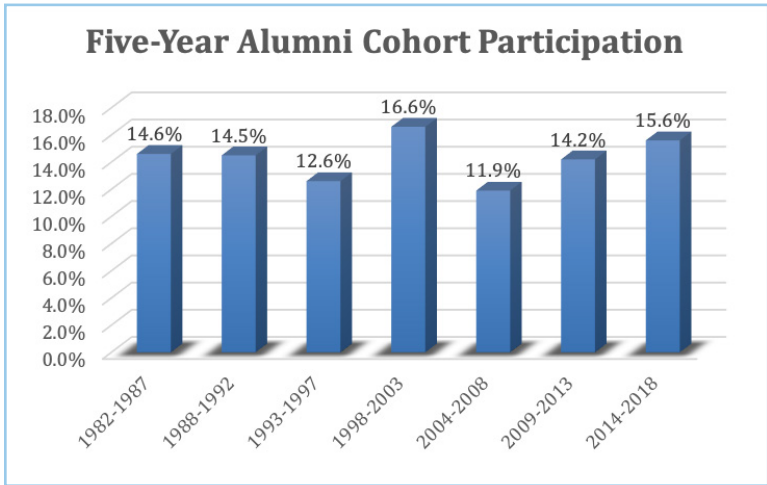
Statistics on degrees and educational attainment were obtained from analyzing longitudinal student data from the National Student Clearinghouse, a national database of student-level records of attendance and degrees awarded from most of the colleges and universities in the United States as well as through survey data. Comparisons are made to national or state-level data where possible in this paper to provide a sense of scale, while also acknowledging that NCSSM has a unique model and therefore appropriate comparison schools or numbers are at times very limited. This study focuses on the description of school and alumni contributions and does not attempt to address the counterfactual as in an evaluation or impact study. We recognize this as a limitation in generalizing overall impact, but with a robust sampling of alumni and combining data from multiple sources, **this study offers important insights into the return on investment made by the State of North Carolina in the development of leadership and human capital to promote social and economic impact.**

# NCSSM Alumni as Contributors to NC Economy and Communities

## Alumni Survey Response Overview

While we surveyed both residential and online program alumni, the differences in the alumni databases, size of the classes, and age of the residential program compared to the online program meant that 95% of our responses were from residential alumni. It is due to these differences that unless otherwise noted in the data, we provide data mostly regarding NCSSM-Durham residential classes. A further report will explore online program outcomes in further detail.

The number of total alumni from the classes of 1982-2018 included 10,689. Of that total, the NCSSM Foundation had active emails for 7,690 alumni. Of those with active emails, 1,741 residential alumni participated in the survey (22.6%). Breaking down the respondents across five-year cohorts shows an equal distribution across the years.



**1,741**  
alumni participated  
in the survey with a  
**– 22.6% –**  
response rate from  
residential alumni



## Demographics of Survey Participants

The demographics of the survey participants show a diversity of respondents that are generally representative of the alumni pool overall. The most recent demographics are provided for the Class of 2019 as well as from national data from 2015 for general comparison only. Alumni survey participants included classes spanning 40 years, so the data for certain race/ethnicity categories may not be reflective of current demographics of North Carolina or NCSSM classes from the most recent years as population shifts have occurred both in NC and nationally with college attendance.

Survey Participant Demographics	NCSSM Alumni Survey Participants	NCSSM Class of 2019	First-Year College Students Nationally <sup>1,2</sup>
<b>Male</b>	41%	47%	45%
<b>Female</b>	57%	53%	55%
<b>Other/Transgender</b>	1%	Not reported	Not reported
<b>Race/Ethnicity</b>			
African American/Black	11%	9%	9%
American Indian or Alaska Native	1%	<1%	<1%
Asian	14%	28%	10%
Hispanic/Latino	3%	4%	10%
White	71%	49%	58%
Two or More Races	3%	5%	13%
Unknown	2%	5%	Not reported
<b>Underrepresented Minority</b>			
Yes	15%	17%	34%
No	83%	78%	66%
Unknown	2%	5%	Not reported
<b>First Generation</b>			
Yes	18%	Not reported	35%
No	82%	Not reported	65%

1. <https://www.heri.ucla.edu/monographs/50YearTrendsMonograph2016.pdf>

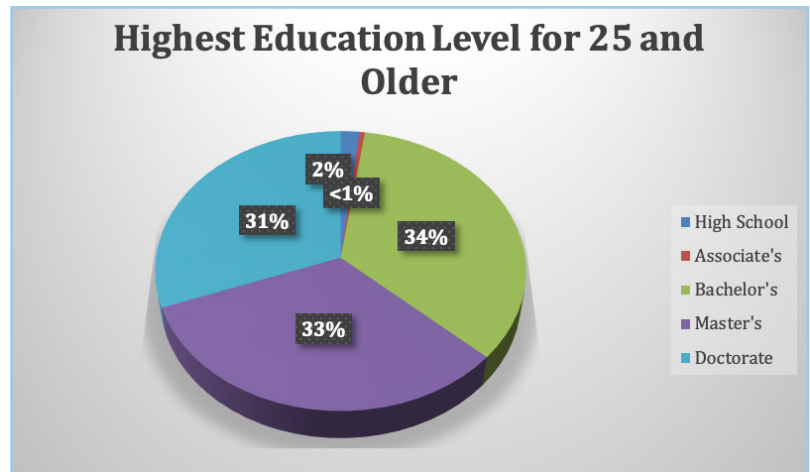
2. <https://www.rochester.edu/college/academics/assets/pdf/College-Student-Diversity-Report.pdf>



## Educational Attainment and University Attendance

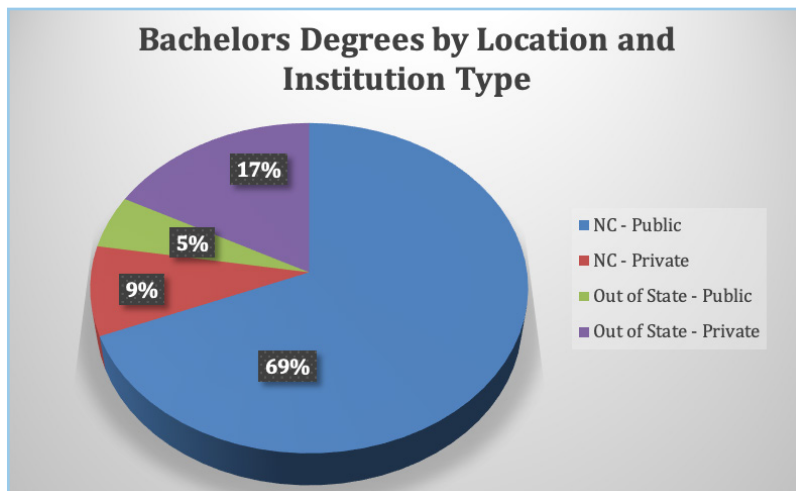
### *NCSSM Graduates Show High Levels of Educational Attainment of Bachelor's and Graduate Degrees*

There is a strong association with education level and success later in life, financially as well as personally.<sup>1</sup> In this study, we tracked educational outcomes of NCSSM graduates both with survey responses from alumni and by analyzing data provided by the National Student Clearinghouse, that provides direct records of matriculation and degrees from higher education institutions throughout the country. Both sources indicate that **98% of NCSSM graduates earn at least a bachelor's degree. While 65% of current alumni 25 and older report that they have also earned at least one graduate degree, 74% of all NCSSM graduates report holding or seeking a master's or doctorate degree.** This can be compared to the overall adult population where only 12% hold an advanced degree as well as bachelor's degree earners in general, of whom about 37% go on to earn a graduate degree. The proportion of NCSSM graduates holding advanced degrees is over five times the national average for adults in the United States and nearly twice that of those who have earned a bachelor's degree.<sup>1</sup> These trends from self-report on the NCSSM alumni survey are confirmed by direct records from National Student Clearinghouse.



Source: [NCSSM alumni survey data from graduates between 1982-2018](#)

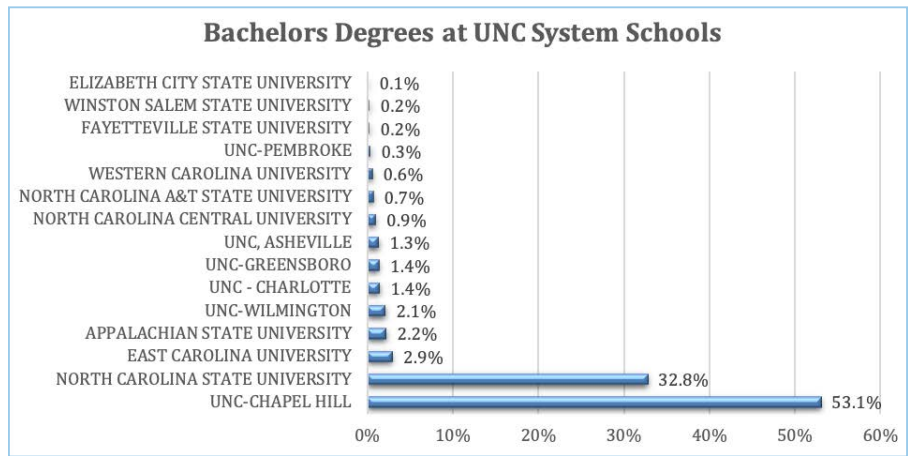
### *Most NCSSM Graduates Remain in NC for College and the Majority Remain in the UNC System*



Source: National Student Clearinghouse records for a sample of graduating NCSSM classes between 2002-2015.

Investments have been made in the education of NCSSM students by the State of North Carolina both for operations of the school to provide a unique and rigorous high school experience, as well as in granting differing levels of tuition-waiver assistance for NCSSM graduates who attend UNC System schools. The tuition waiver program has varied across graduating classes in terms of how many years the waiver covers and the number of students participating, but data from National Student Clearinghouse records show

that **69% of NCSSM graduates earned a bachelor's degree from a UNC System school** with a majority attending NC State and UNC-Chapel Hill. **78% of NCSSM graduates earned their degree at either a public or private institution in North Carolina, retaining these talented students in the state.** A recent study completed by researchers at the University of Rochester and Stanford comparing applicants who stayed in their home high schools to graduates from NCSSM showed a significant increase for both URM graduates and those from rural communities or low-resourced schools in the number of applications and acceptances to highly selective colleges.<sup>2</sup>

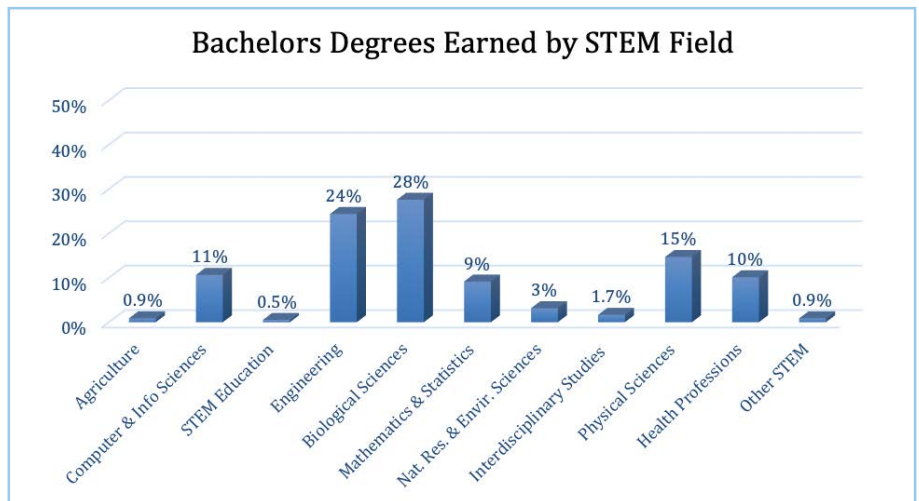


Source: National Student Clearinghouse records for a sample of graduating NCSSM classes between 2002-2015.

### *NCSSM Alumni Earn STEM Degrees at a High Rate and in High-Wage and High-Demand Fields*

While NCSSM provides a comprehensive education including strong programs in the humanities, fine arts, and interdisciplinary coursework, the curriculum and experiences emphasize strong preparation in and exploration of STEM fields. Graduates with a STEM degree have higher median incomes and more positive economic outcomes generally than those without STEM degrees.<sup>3</sup>

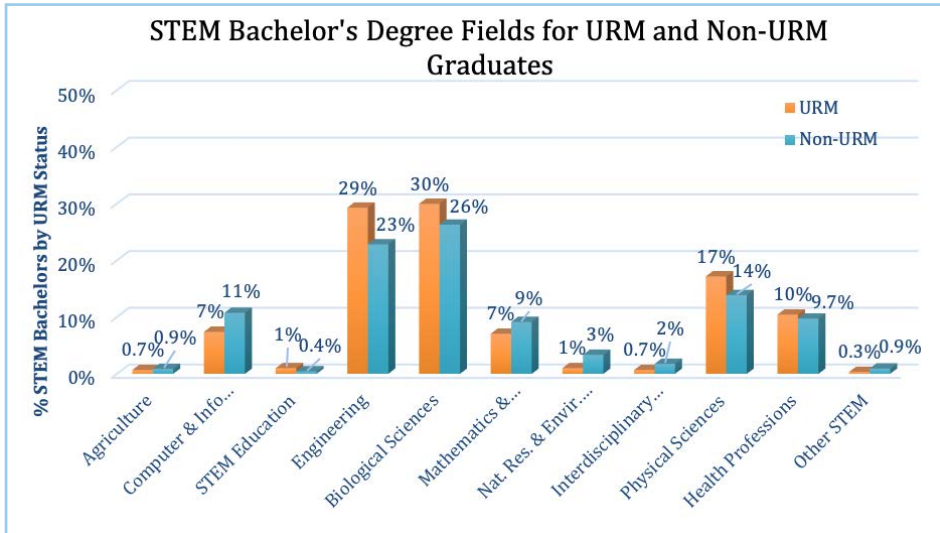
**An analysis of alumni degree fields shows that, about 64% of NCSSM college graduates earn a bachelor's degree in a STEM field and 67% earn at least one bachelor's or graduate degree in a STEM field.** The national average of high school graduates earning bachelor's degrees in STEM fields is about 19%<sup>4</sup> which indicates that NCSSM graduates are earning STEM degrees at over three times the national average.<sup>5</sup> Over half of NCSSM STEM degrees are earned in the fields of engineering (24%) and biological sciences (28%) followed by physical sciences (15%), computer and information sciences (11%), health professions (10%), and mathematics and statistics (9%).



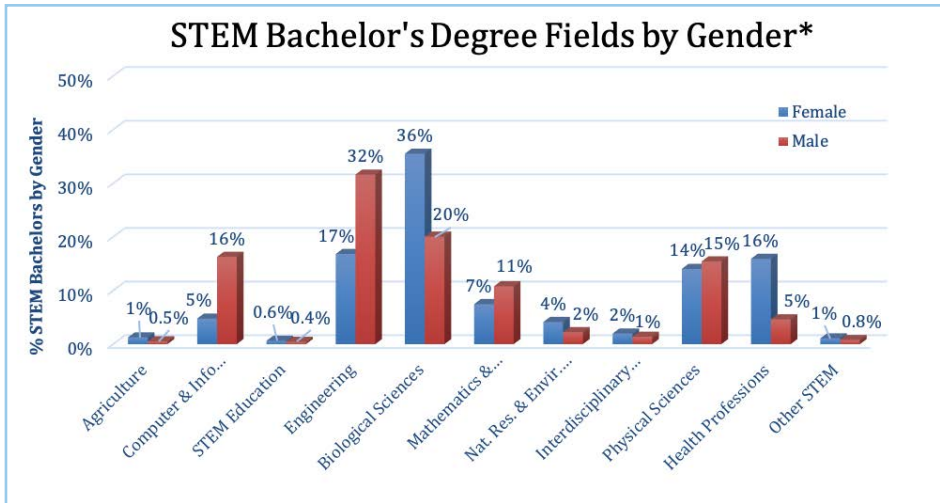
Source: National Student Clearinghouse records for a sample of graduating NCSSM classes between 2002-2015.

Given national trends of underrepresentation of women and some racial/ethnic groups in certain STEM degree programs and careers, we explored the degree fields as well as overall STEM degree attainment for these groups. We found that 58% of NCSSM underrepresented minority (URM)

graduates earned STEM degrees. This is nearly four times the national average, as about 15% of STEM bachelor's degrees conferred by institutions of higher education are completed by URM students.<sup>6</sup> As indicated by National Student Clearinghouse records, NCSSM URM graduates earn their STEM degrees primarily in the fields of engineering and the biological and physical sciences. NCSSM enrolls equal numbers of male and female students and 63% of female graduates earn degrees in STEM fields. Many female graduates major in the biological sciences, a trend that is similar nationally, but also in engineering (17%), health professions (16%), and physical sciences (14%). Women remain underrepresented in the fields of engineering and physical sciences as are URM students. These data show that female and URM graduates of NCSSM persist and complete degrees in fields where they are underrepresented.



Source: National Student Clearinghouse records for a sample of graduating NCSSM classes between 2000-2015.



Source: National Student Clearinghouse records for a sample of graduating NCSSM classes between 2000-2015. \*Note: While we did collect non-binary gender identities in the alumni survey, this information is not available in National Student Clearinghouse records.

NCSSM graduates earn STEM degrees at over **3** times the national average

More than **1/2** of NCSSM STEM degrees are earned in the fields of engineering and biological sciences.

**58%** of NCSSM underrepresented minority (URM) graduates earned STEM degrees.

Nearly **4** times the national average

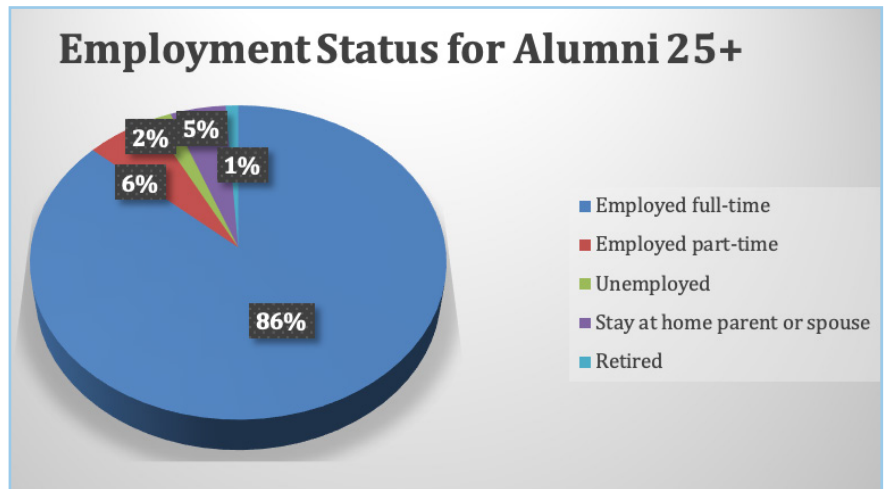
## Careers, Earnings, and Innovation

### *Most NCSSM Alumni are High-Wage Earners and Over Half are Employed in North Carolina*

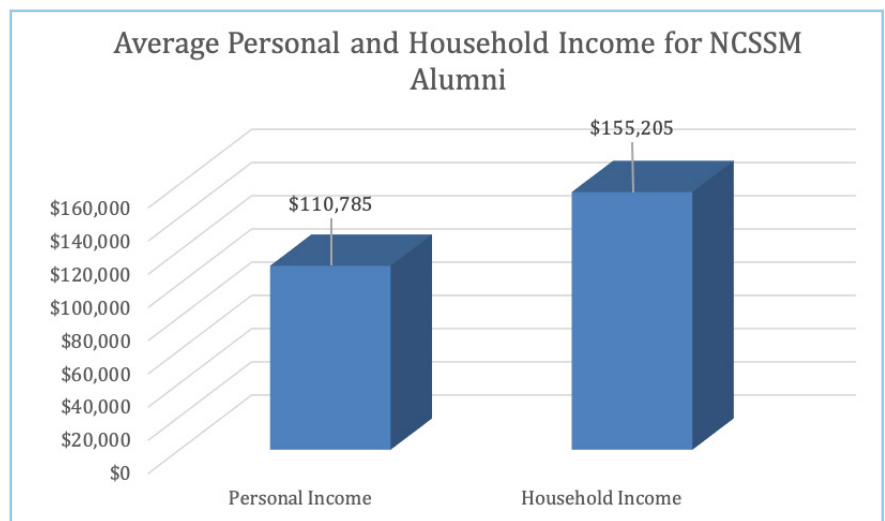
NCSSM is a product of a strong state-level investment in nurturing a talented pipeline of students who contribute to the state, nation, and the world. The majority of alumni (86%) who are not in school reported being employed full-time.

The average annual personal income of NCSSM alumni is more than \$110,785 and household income is more than \$155,205 as reported by alumni participating in the survey. This can be compared to a recent UNC System alumni survey that showed an average annual personal income of \$86,291 and household income of \$124,512. These results are consistent with national trends for income for graduates with a high percentage of advanced degrees as well as studying and working in STEM fields.<sup>1</sup>

More than half of NCSSM's 11,000+ alumni live in and pay taxes in North Carolina (54%). As previously identified by degree completion data, the majority of NCSSM alumni remain in the state for college. Results indicate that some then go on to work or complete graduate degrees in other states but some that leave the state return later on in their careers.

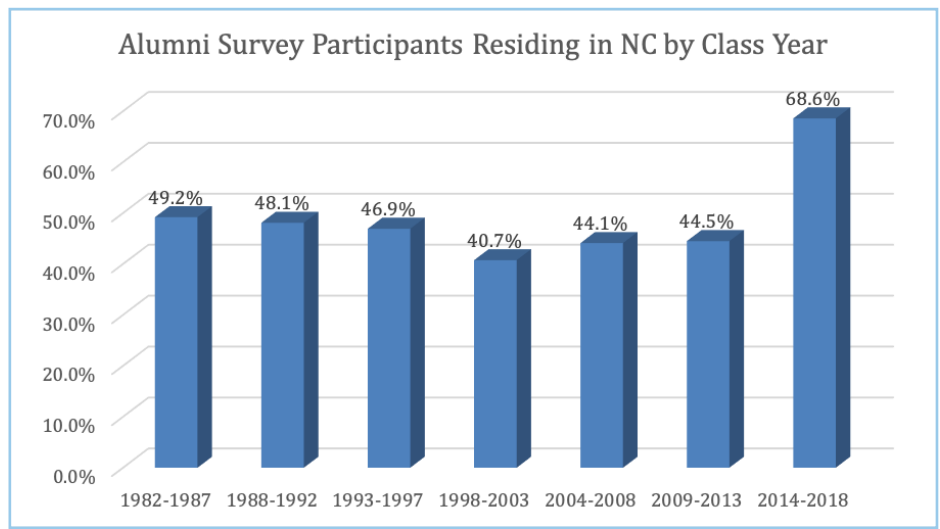


Source: NCSSM alumni survey data from graduates between 1982-2018. Includes alumni 25 years or older who are not currently in school full-time.



Source: NCSSM alumni survey data from graduates between 1982-2018. Average was calculated from all respondents to a survey question on income by taking the median of the income ranges selected and includes alumni 24+ to account for time to graduate from college. The top income bracket denoted \$200,000+ without probing into higher-level incomes, so averages are conservative estimates as many alumni may be making much more than the top amount on the survey.

With an average annual personal income of \$110,000, the 54% of NCSSM alumni who remain in-state stand to earn over \$653 million each year, contributing to state-level spending and economic activity. Following Keynesian macroeconomic theory, in-state spending on goods and services generates state-level economic activity that has a “multiplier effect” on overall state spending and economic output.<sup>7</sup> This multiplier is a factor that is determined by the fraction of spending versus saving activity of a consumer, or the marginal propensity to consume (MPC). This multiplier which can be represented as  $1/(1-MPC)$ .<sup>7</sup> While MPCs for in-state spending vary based on income-level and economic situations, such as recession or expansion, an MPC of .50 and therefore a multiplier of 2.0 has been used in state economic models and other economic contribution studies.<sup>8</sup> **Applying this multiplier effect to the estimated annual in-state alumni earnings of over \$653 million, indicates the potential for NCSSM alumni to contribute over \$1.3 billion of economic activity in earnings and spending in North Carolina each year.**

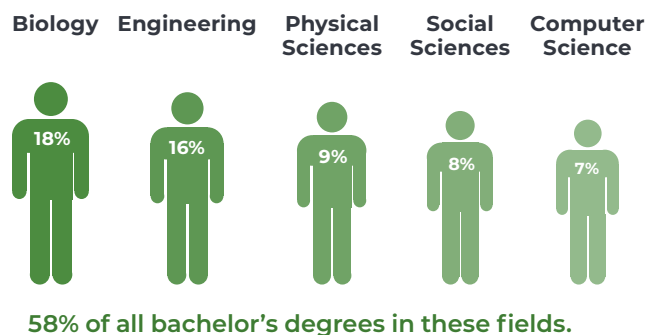


Source: NCSSM alumni survey data from graduates between 1982-2018.

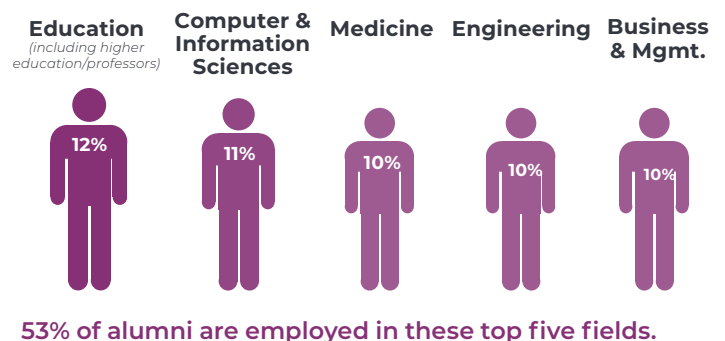
### NCSSM Alumni are Employed in High-Wage and High-Demand Fields with Wide Responsibility and Leadership

The top five fields in which alumni are employed include the sectors of computer and information sciences, business and management, education, medicine, and engineering. Several of these fields are both high-wage and high-demand jobs in North Carolina and nationally. 55% of alumni are employed in STEM related fields, which is nearly four times the national average.<sup>9</sup>

#### Top 5 Degree Fields



#### Top 5 Employment Fields



NCSSM strives to foster a spirit of innovation and creativity along with rigorous academic preparation, and the school's alumni have shown to be creators and innovators. **9% of NCSSM alumni report holding patents and 13% have been a founder, investor, early employee or board member of an entrepreneurial start-up company.** One can compare these results to a similar survey of MIT alumni of which 22% engage in these activities and 31% hold patents.<sup>10</sup> Given the age of MIT alumni in their study and survey responses with their first class in 1940 and the first class of NCSSM being in 1982, **NCSSM graduates are on a path with innovation numbers to be similar to top institutions in the U.S. in innovation and entrepreneurship activities.** For example, the average age of a patent holder is 47 years old and less than one quarter of NCSSM classes have reached this age. 11% of NCSSM alumni own or have founded a company. Again, this can be compared to MIT alumni of which 25% of alumni own companies. Of the NCSSM alumni who participated in the survey and are currently working full-time, **67% reported that they have wide or total responsibility at their jobs, which indicates that alumni take on important leadership roles in organizations.**



Carl A. Ryden '89 is the Founder and currently the EVP of the fintech startup PrecisionLender based in Charlotte, NC. PrecisionLender is one of the fastest growing enterprise SaaS providers of data-driven sales enablement, pricing and portfolio management solutions for financial institutions (FI) globally. Carl also served as chair of the NCSSM Foundation Board of Directors for nearly 10 years. Carl holds a BS in Electrical Engineering from NC State University, a master's degree in Electrical Engineering from MIT, and an MBA from MIT Sloan School of Management.

## Community Contributions

Each and every NCSSM student participates in service in their home communities and contributes to the school's community as a way of giving back for the opportunities that have been afforded to them through the NCSSM experience and state investment in their education. Each class of residential students contributes more than 25,000 hours of volunteer service to North Carolina communities. **Over the last forty years, NCSSM students have contributed over 660,000 hours in service to North Carolina communities.** In addition to giving back to their communities as NCSSM students, the school strives to instill a community mindset through service experiences. 40% agreed that their community service experience at NCSSM inspired them to improve their community as an adult. The survey asked alumni about their activities in service as adults, and **68% of alumni reported that they have served in a leadership role in their community,** including serving as an officer or on a committee for a local club, organization or place of worship, serving on a local government board or commission, running for political office, working on a political campaign for a candidate or cause, or serving on the board of a non-profit organization. 40% agreed that their community service experience at NCSSM directly inspired them to improve their community as an adult. In addition to serving their communities, many NCSSM alumni have taught or plan to teach in STEM fields (30%), passing on knowledge and experiences gained at NCSSM and beyond to the next generation.

# NCSSM's Operational and Capital Expenditures

## IMPLAN Analysis

### *NCSSM-Durham IMPLAN Method*

The contribution made by NCSSM's Durham campus to the economy of North Carolina through its operating expenditures has been estimated using IMPLAN economic modeling software<sup>1</sup>. We used this methodology to provide more detail into the contributions of operating budgets. IMPLAN allows users to estimate the direct, indirect and induced effects of an industry on a specified region. As we are not measuring the impact of a new education institution, but rather the effects of an existing institution (operating costs of NCSSM-Durham campus) on the State of North Carolina, our study constitutes an economic 'contribution' analysis rather than an economic 'impact' analysis<sup>2</sup>. NCSSM does not fit neatly within the 536 sectors available in the IMPLAN software and is expected for several reasons, not least that it is a two-year residential high school, to have a different institutional spending pattern than other state/local government education institutions.

As a result, we have chosen to build our own model by compiling information on NCSSM's 2017-2018 expenditures and mapping each expenditure to one of IMPLAN's 536 sectors<sup>3</sup>. This line item spending pattern approach is a version of a process called 'analysis-by-parts'<sup>4</sup>. In our analysis-by-parts we have modeled full-time, part-time and temporary employee compensation as a labor income event and modeled the remainder of NCSSM's 2017-2018 expenditures as commodity output events. We have chosen to model expenditures as commodity outputs rather than industry outputs as we have limited information about which industries produce the products that we purchase. In addition to employee compensation, we entered 82 commodity output events into the software before running our analysis<sup>5</sup>. Since we do not know the Local Purchase Percentage (LPP) for most of the commodities, LPP has been set to the Social Accounting Matrix (SAM) model value<sup>6</sup> unless we know that the

### *NCSSM-Durham IMPLAN Results*

The table below provides an overview of the results of our analysis.

#### **IMPLAN's employment includes full-time, part-time, and temporary positions.<sup>7</sup>**

Effect	Employment	Labor Income	Value Added	Output
<b>1 - Direct</b>	240.00	\$18,550,906.46	\$18,550,906.46	\$23,776,708.00
<b>2 - Indirect</b>	58.91	\$2,404,242.83	\$3,171,772.89	\$5,513,538.11
<b>3 - Induced</b>	122.52	\$5,447,421.03	\$9,998,715.41	\$17,361,481.63
<b>Total Effect</b>	421.43	\$26,402,570.32	\$31,721,394.76	\$46,651,727.73

### **Employment:**

Our model estimates that NCSSM-Durham creates and maintains 421.4 jobs including 240 direct, 59.9 indirect and 123.5 induced jobs.

### **Labor income:**

From the table above, these jobs will earn \$26,402,570.32 in labor income, including \$18,550,906.46 in direct employee compensation (including wages, salaries and benefits), \$2,404,242.83 of indirect labor income and \$5,447,421.03 of induced labor income.

### **Value added:**

Since NCSSM is a public institution and there are no “Other Property Type Income or Taxes” on production and imports, direct added value is the same as labor income. Added to indirect and induced added value, this gives a total added value of \$31,721,394.76.

### **Output:**

From the model, total output is estimated at \$46,651,727.73. Direct output is equal to value added plus intermediate expenditures. The total that we modeled for employee compensation and intermediate expenditures on commodities in 2017-2018 was \$23,776,708. Indirect output was estimated by the model at \$5,513,538.11 and induced output was estimated at \$17,361,481.63.

## **NCSSM-Morganton Construction and Projected Operating Contribution**

In 2016, North Carolina voters passed the Connect NC bond package which included \$58 million to grow a second campus of the North Carolina School of Science and Mathematics in Morganton (NCSSM). Planning commenced in late 2016 with the hiring of an architectural firm, educational program design consultants, and a planning director. NCSSM will open its second campus in 2022 with an initial enrollment of 300 students in the residential program.

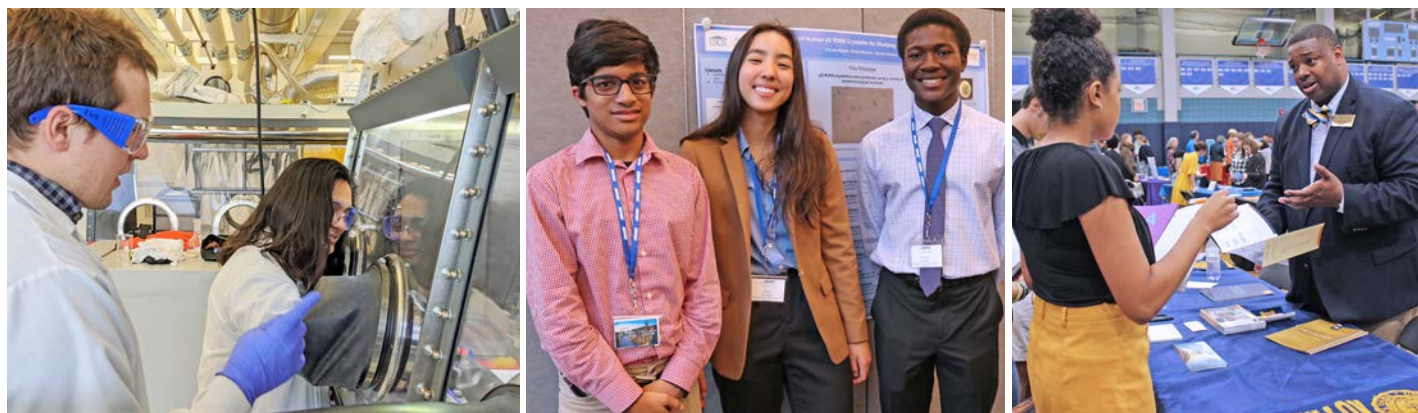




During initial concept phases, an economic impact study was conducted by Dr. Michael Walden, a professor at NC State University, where the IMPLAN model was used to provide projections of costs and impacts of construction and operations specific to Burke County and the state. This report concluded that during the construction period the project would add \$32.8 million of economic impact to Burke County and a total of \$52.6 million of economic impact to North Carolina. Projections indicated that employment would increase by 207 positions in Burke County and by 380 positions in North Carolina during construction.

NCSSM construction of the Morganton campus is now in a phase of construction to provide the actual costs and employment impacts with the understanding of some construction cost fluctuation given the market. There is currently \$81 million invested into the design and construction of the Morganton campus. Current estimates indicate that the construction and opening the Morganton campus will support at least 400 construction jobs in the state of NC and 100 permanent staff and faculty. The annual operating budget is expected to be about \$11.5 million.

As shown from the operating impact of NCSSM-Durham, this number would be estimated to double to roughly \$23 million of statewide impact including direct, indirect, and induced effects. While the construction and operating impacts will impact the state as well as the Unifour region, perhaps the greatest contribution of this investment over time, as shown previously of NCSSM-Durham alumni, will be in supporting an initial increase of 300 NCSSM residential students as well as increased distance learning and summer program/enrichment opportunities as an investment in leaders and skilled workforce contributing to the state of North Carolina, the nation, and the world.



# References

- <sup>1</sup> Baum, Sandy, and Patricia Steele. "[Who goes to graduate school and who succeeds?](#)" AccessLex Institute Research Paper 17-01 (2017).
- <sup>2</sup> Shi, Ying. [Who Benefits from Selective Schools? Evidence from High-Achieving Math and Science Students in North Carolina Working Paper](#). Disponível em: <http://www.sole-jole.org/17461.pdf>, 2016.
- <sup>3</sup> de Brey, Cristobal, Lauren Musu, Joel McFarland, Sidney Wilkinson-Flicker, Melissa Diliberti, Anlan Zhang, Claire Branstetter, and Xiaolei Wang. "[Status and Trends in the Education of Racial and Ethnic Groups 2018. NCES 2019-038](#)." National Center for Education Statistics (2019).
- <sup>4</sup> Snyder, Thomas D., Cristobal De Brey, and Sally A. Dillow. "[Digest of Education Statistics 2017, NCES 2018-070](#)." National Center for Education Statistics (2019).
- <sup>5</sup> Hope, Joan. "[Degree growth in hard sciences outpaces other disciplines](#)." The Successful Registrar 17, no. 4 (2017): 8-8.
- <sup>6</sup> Estrada, Mica, Myra Burnett, Andrew G. Campbell, Patricia B. Campbell, Wilfred F. Denetclaw, Carlos G. Gutiérrez, Sylvia Hurtado et al. "[Improving underrepresented minority student persistence in STEM](#)." CBE—Life Sciences Education 15, no. 3 (2016): es5.
- <sup>7</sup> Bartik, Timothy. "New evidence on state fiscal multipliers: Implications for state policies." (2017).
- <sup>8</sup> Suárez Serrato, Juan Carlos, and Philippe Wingender. [Estimating local fiscal multipliers](#). No. w22425. National Bureau of Economic Research, 2016.
- <sup>9</sup> Funk, C., and K. Parker. "Diversity in the STEM workforce varies widely across jobs." Pew Research Center, Washington DC, January 9 (2018): 2018.
- <sup>10</sup> Roberts, Edward B., Fiona Murray, and J. Daniel Kim. "[Entrepreneurship and Innovation at MIT: Continuing global growth and impact](#)." Edward B. Roberts, Fiona Murray and J. Daniel Kim (2019), "Entrepreneurship and Innovation at MIT: Continuing Global Growth and Impact—An Updated Report", Foundations and Trends in Entrepreneurship 15, no. 1 (2019): 1-55.

# Acknowledgements

We would like to thank the following for their support and contributions to this report and the larger study: Dr. Caroline Courtney for her research and analysis on alumni survey data and Implan analysis; Dajer Fernandez, Elizabeth Reilly, and Cameron Howell from the UNC System Strategy and Policy team for consultation and technical implementation of the alumni survey instrument; Dr. Steven Ha (Western Carolina University College of Business), Dr. Larry Chavis (UNC-Chapel Hill Kenan-Flagler Business School), and Dr. Billy Pizer (Duke University Sanford School of Public Policy and Nicholas Institute for Environmental Policy Solutions) for their expert consultation and review; Dr. Michael Walden at NC State University for an Implan analysis of NCSSM-Morganton construction and operation; NCSSM team members Paul Namaste and Lacy Kelly Ramos for report data, graphics, and layout support; and the NCSSM Foundation for financial support.

**Primary author:** Krissi Hewitt, Ph.D., NCSSM Director of Institutional Research and Strategic Initiatives

**Primary contact:** Brock Winslow, Vice Chancellor for External Relations | (919) 416-2864 or [winslow@ncssm.edu](mailto:winslow@ncssm.edu)





**NCSSM**

North Carolina School of Science and Mathematics  
1219 Broad Street, Durham, NC 27705 • [ncssm.edu](http://ncssm.edu)

*Igniting innovation, cultivating community.*