Unity College

New Program Opportunity Assessment

presented by

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About Stamats

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- Image and perception studies
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Strategic Creative
- Recruiting and advancement campaigns
- Institutional and advancement websites
- Mobile and social media solutions
- Strategic digital experience
- Full-media advertising campaigns
Key Study Objectives

Objectives of Analysis and Full Report:
Provide research-based insight into the student enrollment potential of specified new undergraduate environmental or sustainability science program offerings nationally where there appears to be sizable or growing demand.

- The primary objective of this first phase is to help Unity College identify possible undergraduate academic programs from the taxonomy of 1,159 possible disciplines in the Integrated Postsecondary Education Data System (IPEDS) as of the 2014–2015 reporting year.

- The initial program review centers on all undergraduate programs with an “environmental or sustainability science” orientation. However, due to the classification system in IPEDS, it is nearly impossible to isolate academic programs specifically geared toward sustainability and/or environmental science, especially programs like those currently offered by Unity wherein sustainability and environmental science are infused across the curriculum.

- Therefore, this initial review will be used to isolate the natural-science-related programs that present the largest opportunity for enrollment based on several factors (following slides).

- Analysis focuses on identification of apparent gaps in the market reflecting each program’s share of the core recruitment market relative to the share for the national market, the scale of demand for each program (number of students enrolled), trends in program growth or decline, and the incidence/demand demonstrated by institutions in similar settings.
Statement Regarding This Report

- The New Program Opportunity Assessment specified for this study includes two parts. Findings provided in this report (Part One) identify the results of an initial review of program opportunities.

- This report is intended to inform the decision-making process in the selection of up to five (5) “semifinalist” programs demonstrating the greatest enrollment growth potential (based on student demand via IPEDS) to be explored through further analysis.

- Subsequently, Part Two of this study will focus on the selected five programs and will provide deeper analysis on market trends, online job-posting data/trends, identification of highly successful programs, and opportunities related to environmental or sustainability science for each discipline. After a critical review of Part Two, two programs will be selected for further analysis.

- The final two programs selected for review will be profiled in greater depth, including full competitor/comparator reviews, comparisons on cost, program modality, and key program features.

- With the key intention of informing which programs to select for deeper analysis in Part Two, it is important to provide as much summary data from our initial analysis as possible. You will find that much of the data provided in this reporting component are highly tabular in nature.
Methodology – Part One Initial Review

- Secondary data were collected from IPEDS and were used to analyze the most recent national and regional (New England states including Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont) degree conferment for a five-year period (2011 to 2015). Analysis included:
  - Incidence—exploration of national and regional program share
  - Scale—total number and average number of degrees conferred each year
  - Trend—recent trends in program demand (expressed in terms of total growth, percentage growth, and standardized trends)
  - Gap—using national data as a model estimate projected to the regional market, an indicator of likely unmet demand (degree deficit) or likely market saturation (degree surplus)

- As a point of reference, statistical definitions, as well as regional/local market definitions used in this report are provided on the following slides.
Unity-Like-School Comparison Group

- One of the methods we used to identify program potential is “like-school” incidence. Like-school incidence looks at the schools that are similar to Unity in a variety of ways (noted below). Stamats then looked at the incidence of degrees conferred to identify gaps in incidence compared to the regional market (New England). This is one measure of unmet demand we used.

- To determine the like-school list, the following factors were combined to identify schools:
  - Total undergraduate enrollment between 300 and 1,500 students
  - Private not-for-profit institution
  - Association for the Advancement of Sustainability in Higher Education (AASHE) member institution
  - Offers on-campus housing
  - Offers at least one program (by CIP code designation) similar to Unity College
  - Ninety percent or more of their institutional enrollment is from the undergraduate market.

- A total of 37 institutions were identified using the above criteria. A full listing of like-schools can be found in appendix A.
  - Green Mountain and Prescott College were not included in the like-school list because each institution had greater than 10% of their total enrollment from graduate students.
Scale, Trends, and Gap Analysis

- **Share of Bachelor’s Degrees**: Represents the percentage of all bachelor’s degrees conferred nationally (US) or regionally (New England, in this case) for a given CIP code over a five-year period. For example, there were 344,864 bachelor’s degrees conferred in biology (26.0101) at the national level; 344,864 represents 3.57% (incidence) of all bachelor’s degrees awarded in the US across all CIP codes in the IPEDS universe. Likewise, 19,335 were conferred in New England, representing a share of 3.16%.

- **Raw Deficit or Surplus**: Using the national distribution of degrees conferred as the framework, and modeling that distribution at the regional level (New England, in this example), we calculate how many degrees were under awarded (deficit) or over awarded (surplus) at the regional level. Using this approach, there are 2,533 fewer bachelor’s in biology degrees awarded in New England than expected. The illustration above is ranked by raw deficit, in descending order.
Maximum Incidence

- The last method we use to estimate program potential is maximum incidence. Using the same concept of incidence as defined on the previous slide, maximum incidence is calculated using the mean and standard deviation for each of the Classification of Instructional Programs (CIP) in the IPEDS universe.

- Looking at incidence of degree conferment at the Combined Statistical Area (CSA), and comparing the incidence levels across all 162 CSAs that make up the IPEDS universe, a distribution by CIP code was calculated for each of the 1,159 CIP codes in the IPEDS universe.

- Therefore, a maximum incidence for a CSA would equal the mean incidence plus one standard deviation. For example, CIP code 01.0000 (agriculture, general) has a mean incidence level of .001671 and a standard deviation of .007562. Therefore, adding the mean and standard deviation, we have a maximum incidence of .009234 or .9234%.

- Applying what we know about a normal distribution, we know that an incidence level greater than one standard deviation from the mean would incorporate nearly 85% of all possible incidence levels. Incidence levels greater than one standard deviation would be considered outliers and, barring any significant market factors (access to a nuclear reactor for the nuclear engineering program for example), offering a new program in that market would be unadvisable, regardless of the competitive pressure.
Environmental Sciences

- Borrowing language from the contract, “trend analysis to identify undergraduate environmental science/sustainability-related academic programs nationally where there appears to be sizable or growing demand,” a definition for the environmental sciences was developed.

- After our on-campus visit and speaking with Dr. Melik Khoury in January 2017, programs outside of the Unity College mission of environmental science were removed from the analysis due to issues of mission fit. Although opportunities for sustainability issues exist outside of the hard-science realm (sustainable business for example), for this report at least an initial emphasis was given to programs that fell into one of the seven CIP families listed below.
  - 01-Agriculture
  - 03-Natural Resources and Conservation
  - 14-Engineering
  - 15-Engineering Technologies and Engineering-Related Fields
  - 26-Biological and Biomedical Sciences
  - 30-Multi-Indersciplinary Studies (sustainability studies, marine sciences, human biology, to name a few)
  - 40-Physical Sciences

- A total of 318 CIP codes were identified. The following slides represent all the programs with at least unmet need being greater than 25 degrees (more than five degrees per year on average).
Statistical Definitions

- **Five-year total**: A sum of all degrees awarded between 2011 and 2015.

- **# Change from 2011**: The difference in degrees conferred in 2015 from 2011, represented as a whole number. If an institution did not award a degree in 2011, the increase is equal to the number of degrees awarded in 2015.

- **% Change from 2011**: The difference in degrees conferred in 2015 from 2011, represented as a percentage. If an institution did not award a degree in 2011, the percentage increase was not calculated.

- **Slope**: The ratio of the amount that degrees conferred (y) increased (or decreased) on average between 2011 and 2015 (x), represented as an integer. The increase is averaged out over the entire time period. If an institution did not award a degree in one or more years, that is accounted for in the slope statistic.

- **Median**: The midpoint value in a series of values.

- **Mean**: The average number of degrees awarded annually over the 2011 to 2015 time period by an institution, represented as a whole number.

- **Slope/Mean**: A statistic that Stamats uses to normalize the slope coefficient. The slope coefficient does not account for scale. By dividing the slope statistic by the corresponding mean value for the same period, we can compare growth among institutions (or disciplines) regardless of scale. The slope/mean statistic is represented as a percentage.
Environmental Science Deficit Programs – 1

- Undergraduate programs are sorted descending by greatest potential unmet need for the New England market.
- Undergraduate programs with above-average slope/mean values (strong positive growth) compared to the national average (2.6%) are indicated in green.
- Undergraduate programs with like-school incidence values greater than the New England market are indicated in green as well.
Environmental Science Deficit Programs – 2

- Undergraduate programs are sorted descending by greatest potential unmet need for the New England market.
- Undergraduate programs with above-average slope/mean values (strong positive growth) compared to the national average (2.6%) are indicated in green.
- Undergraduate programs with like-school incidence values greater than the New England market are indicated in green as well.
Environmental Science Deficit Programs – 3

- Undergraduate programs are sorted descending by greatest potential unmet need for the New England market.
- Undergraduate programs with above-average slope/mean values (strong positive growth) compared to the national average (2.6%) are indicated in green.
- Undergraduate programs with like-school incidence values greater than the New England market are indicated in green as well.
Undergraduate programs are sorted descending by greatest potential unmet need for the New England market.

Undergraduate programs with above-average slope/mean values (strong positive growth) compared to the national average (2.6%) are indicated in green.

Undergraduate programs with like-school incidence values greater than the New England market are indicated in green as well.
### Environmental Science Deficit Programs – 5

<table>
<thead>
<tr>
<th>CIP</th>
<th>CIP Label</th>
<th>Grand Total</th>
<th>Share of US Bachelors</th>
<th>Share of New England Bachelors</th>
<th>National Slope</th>
<th>National Slope/Mean</th>
<th>Raw Deficit or Surplus</th>
<th>&quot;Like School&quot; Incidence</th>
<th>Maximum Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.1103</td>
<td>Bioinformatics</td>
<td>674</td>
<td>0.01%</td>
<td>0.00%</td>
<td>13.1</td>
<td>9.7%</td>
<td>(37)</td>
<td>0.00%</td>
<td>0.02%</td>
</tr>
<tr>
<td>14.2001</td>
<td>Metallurgical Engineering</td>
<td>577</td>
<td>0.01%</td>
<td>0.00%</td>
<td>1.1</td>
<td>1.0%</td>
<td>(37)</td>
<td>0.00%</td>
<td>0.12%</td>
</tr>
<tr>
<td>15.0703</td>
<td>Industrial Safety Technology/Technician</td>
<td>574</td>
<td>0.01%</td>
<td>0.00%</td>
<td>4.2</td>
<td>3.7%</td>
<td>(36)</td>
<td>0.00%</td>
<td>0.12%</td>
</tr>
<tr>
<td>26.0508</td>
<td>Microbiology and Immunology</td>
<td>573</td>
<td>0.01%</td>
<td>0.00%</td>
<td>1.7</td>
<td>1.5%</td>
<td>(36)</td>
<td>0.00%</td>
<td>0.05%</td>
</tr>
<tr>
<td>1.0607</td>
<td>Turf and Turfgrass Management</td>
<td>663</td>
<td>0.01%</td>
<td>0.00%</td>
<td>-6.2</td>
<td>-4.7%</td>
<td>(36)</td>
<td>0.00%</td>
<td>0.04%</td>
</tr>
<tr>
<td>1.0905</td>
<td>Dairy Science</td>
<td>796</td>
<td>0.01%</td>
<td>0.00%</td>
<td>5.0</td>
<td>3.1%</td>
<td>(35)</td>
<td>0.00%</td>
<td>0.09%</td>
</tr>
<tr>
<td>15.0899</td>
<td>Mechanical Engineering Related Technologies/Technicians</td>
<td>1,151</td>
<td>0.01%</td>
<td>0.01%</td>
<td>-26.6</td>
<td>-11.6%</td>
<td>(35)</td>
<td>0.00%</td>
<td>0.07%</td>
</tr>
<tr>
<td>1.0104</td>
<td>Farm/Farm and Ranch Management</td>
<td>628</td>
<td>0.01%</td>
<td>0.00%</td>
<td>9.8</td>
<td>7.8%</td>
<td>(34)</td>
<td>0.00%</td>
<td>0.11%</td>
</tr>
<tr>
<td>15.0401</td>
<td>Biomedical Technology/Technician</td>
<td>528</td>
<td>0.01%</td>
<td>0.00%</td>
<td>-2.1</td>
<td>-2.0%</td>
<td>(33)</td>
<td>0.00%</td>
<td>0.01%</td>
</tr>
<tr>
<td>26.0499</td>
<td>Cell/Cellular Biology and Anatomical Sciences, Other</td>
<td>528</td>
<td>0.01%</td>
<td>0.00%</td>
<td>12.6</td>
<td>11.9%</td>
<td>(33)</td>
<td>0.00%</td>
<td>0.06%</td>
</tr>
<tr>
<td>26.1399</td>
<td>Ecology, Evolution, Systematics and Population Biology</td>
<td>678</td>
<td>0.01%</td>
<td>0.00%</td>
<td>11.1</td>
<td>8.2%</td>
<td>(32)</td>
<td>0.02%</td>
<td>0.02%</td>
</tr>
<tr>
<td>15.0507</td>
<td>Environmental Engineering Technology</td>
<td>516</td>
<td>0.01%</td>
<td>0.00%</td>
<td>11.4</td>
<td>11.0%</td>
<td>(31)</td>
<td>0.00%</td>
<td>0.11%</td>
</tr>
<tr>
<td>1.0401</td>
<td>Agricultural and Food Products Processing</td>
<td>483</td>
<td>0.00%</td>
<td>0.00%</td>
<td>1.6</td>
<td>-1.7%</td>
<td>(31)</td>
<td>0.00%</td>
<td>0.09%</td>
</tr>
<tr>
<td>15.0305</td>
<td>Telecommunications Technology/Technician</td>
<td>477</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-6.9</td>
<td>-7.2%</td>
<td>(30)</td>
<td>0.00%</td>
<td>0.02%</td>
</tr>
<tr>
<td>14.1101</td>
<td>Engineering Mechanics</td>
<td>472</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-2.4</td>
<td>-2.5%</td>
<td>(30)</td>
<td>0.00%</td>
<td>0.02%</td>
</tr>
<tr>
<td>1.0301</td>
<td>Agricultural Production Operations, General</td>
<td>448</td>
<td>0.00%</td>
<td>0.00%</td>
<td>10.8</td>
<td>12.1%</td>
<td>(28)</td>
<td>0.00%</td>
<td>0.04%</td>
</tr>
<tr>
<td>1.0899</td>
<td>Agricultural Public Services, Other</td>
<td>445</td>
<td>0.00%</td>
<td>0.00%</td>
<td>-5.1</td>
<td>-5.7%</td>
<td>(28)</td>
<td>0.00%</td>
<td>0.07%</td>
</tr>
<tr>
<td>15.0607</td>
<td>Plastics and Polymer Engineering Technology/Technician</td>
<td>433</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.7</td>
<td>0.8%</td>
<td>(27)</td>
<td>0.00%</td>
<td>0.08%</td>
</tr>
<tr>
<td>15.0801</td>
<td>Aeronautical/Aerospace Engineering Technology</td>
<td>432</td>
<td>0.00%</td>
<td>0.00%</td>
<td>9.4</td>
<td>10.9%</td>
<td>(27)</td>
<td>0.00%</td>
<td>0.13%</td>
</tr>
<tr>
<td>26.1304</td>
<td>Aquatic Biology/Limnology</td>
<td>420</td>
<td>0.00%</td>
<td>0.00%</td>
<td>4.5</td>
<td>5.4%</td>
<td>(27)</td>
<td>0.00%</td>
<td>0.01%</td>
</tr>
</tbody>
</table>

- Undergraduate programs are sorted descending by greatest potential unmet need for the New England market.
- Undergraduate programs with above-average slope/mean values (strong positive growth) compared to the national average (2.6%) are indicated in green.
- Undergraduate programs with like-school incidence values greater than the New England market are indicated in green as well.
Part Two: Focused Review of Five Programs
Methodology – Part Two Focused Review

- Following the phone call with President Khoury and Dr. John Zavodny on March 17, 2017, and the follow-up confirmation email, the programs to be examined in more detail include (with corresponding CIP codes included):
  - Biological and Biomedical Sciences – (26.9999)
  - Natural Sciences – (30.1801)
  - Chemistry – (40.0501)
  - Geology/Earth Science – (40.0601)
  - Business Administration and Management – (52.0201)
    - With a special attention towards sustainable business and ecotourism

- This more comprehensive review will include the following:
  - Job-posting data for each program with special attention towards titles/positions focused on sustainability and/or environmental science
  - National, regional (New England), and like-school market trends
  - Brief summaries/profiles of highly successful programs in each discipline
  - An estimate regarding market potential for Unity based on the success of other schools who entered this market in the last few years, i.e., “ramp-up” time

- The ultimate goal will be to identify the one or two programs for a more detailed review that will provide Unity College the most opportunity in terms of market differentiation and enrollment potential.
Job-Posting Data
Overview of Jobs Data

- Because of the breadth of academic outcomes associated with many of the natural science degree programs, as illustrated throughout the report, it is difficult to isolate the specific jobs data for each discipline. Since many of the potential competitors, as well as the discipline itself, lend themselves to numerous outcomes for program graduates, Stamats used the science and research job family to profile employment in New England in these disciplines for the second part of this report.

- For example, each program offered a very focused program option as well as several different varieties (either via concentration, build your own major, or tracks) that could be tailored to your own specific career outcome. Some of these outcomes included graduate/professional school, health sciences, teacher, laboratory technician, researcher, policy analyst, etc.

- The following slide illustrates the demand and summary data for science and research professions. Within each discipline (biology, natural science, chemistry, geology) are the skills and industries specific to that discipline, but the job-posting data is at the job-family level given the issues presented above.
  - Note that biological and natural science skills and industries data were identical and, therefore, to avoid redundancy, were included in this section as opposed to individual program sections.

- Lastly, if a program is chosen for further exploration, a more detailed review of job-posting data will be conducted and will focus at the specific program type, not the overarching job family (science and research).

- Sustainable business enterprise jobs data are included in the section report for that program.
Science and Research Bachelor’s Job Counts

<table>
<thead>
<tr>
<th>Job Title/Family</th>
<th>Region</th>
<th>2012</th>
<th>2016</th>
<th>Five-Year Total</th>
<th>Number Change from 2012</th>
<th>Percent Change from 2012</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science and Research</td>
<td>New England</td>
<td>2,537</td>
<td>4,274</td>
<td>16,237</td>
<td>1,737</td>
<td>68.47%</td>
<td>436.0</td>
<td>3,247</td>
<td>13.43%</td>
</tr>
<tr>
<td>Science and Research</td>
<td>Nation</td>
<td>42,245</td>
<td>53,259</td>
<td>233,315</td>
<td>11,014</td>
<td>26.07%</td>
<td>3667.2</td>
<td>46,663</td>
<td>7.86%</td>
</tr>
</tbody>
</table>

- The New England area is defined as all job postings in CT, ME, MA, NH, RI, and VT.
- The numbers above represent all the web postings that require at least a bachelor’s degree upon entry.
- As demonstrated above, the number of local (New England) job postings for science and research positions is growing faster than the national average. Furthermore, the magnitude of this difference (nearly 2x) illustrates the number of job postings in science and research in New England is growing nearly twice as fast as the nation as a whole.
- Considering the regional focus of Unity in terms of prospective undergraduate students, this bodes well for any new program related to science and research.
<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Occupational Title</th>
<th>BLS/OES 2015 Nationwide</th>
<th>Salary Nationwide</th>
<th>Education Nationwide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Number Employed in 2015</td>
<td>Projected Change Over 10 Years</td>
<td>Burning Glass Mean Salary</td>
</tr>
<tr>
<td>19-2031</td>
<td>Chemists</td>
<td>84,720</td>
<td>2.6%</td>
<td>$61,903</td>
</tr>
<tr>
<td>19-4021</td>
<td>Biological Technicians</td>
<td>72,900</td>
<td>5.3%</td>
<td>$44,552</td>
</tr>
<tr>
<td>19-1022</td>
<td>Microbiologists</td>
<td>21,210</td>
<td>3.6%</td>
<td>$49,918</td>
</tr>
<tr>
<td>19-4031</td>
<td>Chemical Technicians</td>
<td>64,770</td>
<td>1.8%</td>
<td>$64,995</td>
</tr>
<tr>
<td>19-1021</td>
<td>Biochemists and Biophysicists</td>
<td>30,800</td>
<td>8.2%</td>
<td>N/A</td>
</tr>
<tr>
<td>19-2042</td>
<td>Geoscientists, Except Hydrologists and Geographers</td>
<td>31,800</td>
<td>10.4%</td>
<td>N/A</td>
</tr>
<tr>
<td>19-1029</td>
<td>Biological Scientists, All Other</td>
<td>32,050</td>
<td>-0.5%</td>
<td>N/A</td>
</tr>
<tr>
<td>19-1013</td>
<td>Soil and Plant Scientists</td>
<td>14,610</td>
<td>6.8%</td>
<td>N/A</td>
</tr>
<tr>
<td>19-4041</td>
<td>Geological and Petroleum Technicians</td>
<td>16,820</td>
<td>12.1%</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Science and Research Bachelor’s Job Market Summary – 2

- The Burning Glass occupational codes for science and research incorporate 23 Bureau of Labor Statistics/Occupational Employment Statistics (BLS/OES) occupation codes. The occupation codes most related to the proposed Unity programs are presented on the previous slide.

- Using BLS data to estimate the total market (number employed in 2015), as well as the percentage of employees currently at a bachelor’s degree or higher, provides context as to the unmet demand in the current labor force, i.e., retooling. If the proportion of people with a bachelor’s degree or higher was significantly lower than the proportion of jobs requiring a bachelor’s degree, you could expect a decent share of students currently employed in the field being a market for your program. In these data, technicians (biological, chemical, and geological/petroleum) are currently undereducated compared to the current job-posting data.
The top industries for biological natural sciences in the New England region

- Pharmaceutical and Medicine Manufacturing: 26%
- Scientific Research and Development Services: 26%
- Colleges, Universities, and Professional Schools: 15%
- General Medical and Surgical Hospitals: 14%
- Software Publishers: 3%
- Employment Services: 2%
- Executive, Legislative, and Other General Government Support: 2%
- Management, Scientific, and Technical Consulting Services: 2%

- Of the 2,281 job postings in 2016 for biological and natural sciences, two-thirds (66%) were tied to a specific employer or type of industry. A total of 47 different segments were indicated. The largest segments are presented above.

- Given the wide spectrum of biological and natural science options, it is surprising that most industries hiring related professionals are in a field directly/indirectly tied to biology and pharmaceuticals. That being said, the inclusion of biology might be inflating the importance of biology (general biology versus a broader spectrum of natural science options) in these job postings.
The top skills for biological and biomedical sciences in the New England region

- Biology: 37%
- Clinical Research: 23%
- Molecular Biology: 22%
- Experiments: 21%
- Microsoft Excel: 20%
- Budgeting: 20%
- Clinical Trials: 19%
- Project Management: 18%

- Nearly all (99%) of the job postings in 2016 for biological and natural sciences listed specific skills necessary (or preferred) for the positions. A total of 200 unique skills were indicated. The most popular skill sets are presented above.
- Despite being a very technical program, there is a noticeable divide in the technical (biology, clinical research, experiments, etc.) and soft skills (Excel, budgeting, project management) needed for bachelor’s-level biological and natural sciences job postings.
Biological and Biomedical Sciences
Bachelor’s of Biological and Biomedical Sciences

- CIP code 26.9999 (Biological and Biomedical Sciences, Other)
  - Any instructional program in the biological and biomedical sciences not listed above. *This is a catch-all code for programs not specifically belonging to another one of the 26.XXXX CIP codes (64 at the undergraduate level).*

- Typically, Stamats would use caution when recommending XX.9999 program, but given the unique nature of Unity, and trying to find the market opportunity for biological science programs related to environmentalism/sustainability, this seemed like one of a few locations to at least examine in a little more detail at this time.

- Of all the 26.XXXX CIP codes, only one other, biology (26.0101), had a raw deficit in terms of degrees conferred, positive slope, and noticeably higher like-school incidence than the New England market as a whole.

- Since this was a new program assessment, and not a current demand assessment, 26.9999 seemed worth exploring at this level.
## National Market: Bachelor’s Biological Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>1,139</td>
<td>1,127</td>
<td>1,442</td>
<td>1,362</td>
<td>1,519</td>
<td>6,589</td>
<td>380</td>
<td>33.4%</td>
<td>100</td>
<td>1318</td>
<td>7.6%</td>
</tr>
<tr>
<td>Median</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>17</td>
<td>2</td>
<td>30.0%</td>
<td>0</td>
<td>7</td>
<td>6.6%</td>
</tr>
<tr>
<td>Mean</td>
<td>21.5</td>
<td>23.0</td>
<td>26.2</td>
<td>25.2</td>
<td>28.1</td>
<td>81.3</td>
<td>7</td>
<td>30.9%</td>
<td>2</td>
<td>25</td>
<td>6.2%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>53</td>
<td>49</td>
<td>55</td>
<td>54</td>
<td>54</td>
<td>81</td>
<td>1</td>
<td>1.9%</td>
<td>1</td>
<td>53</td>
<td>1.3%</td>
</tr>
<tr>
<td># of Institutions with a Positive Slope</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total number of biological science bachelor’s degrees conferred in the US increased 33% in 2015 versus 2011 (represents 100 additional degrees annually on average).
- The number of institutions offering a bachelor’s degree in biological sciences is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a biological science degree is not entirely responsible for the demonstrated increase in degrees conferred (suggest increased student demand is driving most of the growth).
- Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 7 to 25 degrees per year.
- Similar to the conferment trend in general, nearly 65% of institutions are experiencing an increase in their average annual number of degrees conferred.
New England Market: Bachelor’s Biological Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Springfield College</td>
<td>MA</td>
<td>10</td>
<td>15</td>
<td>16</td>
<td>14</td>
<td>26</td>
<td>81</td>
<td>16</td>
<td>160.0%</td>
<td>3</td>
<td>16</td>
<td>19.1%</td>
</tr>
<tr>
<td>Maine Maritime Academy</td>
<td>ME</td>
<td>19</td>
<td>11</td>
<td>10</td>
<td>14</td>
<td>10</td>
<td>64</td>
<td>-9</td>
<td>-47.4%</td>
<td>-2</td>
<td>13</td>
<td>-11.7%</td>
</tr>
<tr>
<td>University of New Hampshire—Main Campus</td>
<td>NH</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>19</td>
<td>15</td>
<td>45</td>
<td>14</td>
<td>1400.0%</td>
<td>4</td>
<td>9</td>
<td>47.8%</td>
</tr>
<tr>
<td>Boston University</td>
<td>MA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Northeastern University</td>
<td>MA</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td>Marlboro College</td>
<td>VT</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td></td>
<td>31</td>
<td>30</td>
<td>34</td>
<td>47</td>
<td>53</td>
<td>195</td>
<td>22</td>
<td>71.0%</td>
<td>6</td>
<td>39</td>
<td>15.6%</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td></td>
<td>6</td>
<td>11</td>
<td>6</td>
<td>14</td>
<td>10</td>
<td>24</td>
<td>5</td>
<td>81.8%</td>
<td>1</td>
<td>9</td>
<td>12.9%</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td></td>
<td>7.8</td>
<td>10.0</td>
<td>6.8</td>
<td>15.7</td>
<td>10.6</td>
<td>32.5</td>
<td>3</td>
<td>36.8%</td>
<td>1</td>
<td>10</td>
<td>11.2%</td>
</tr>
<tr>
<td><strong>Institutions Conferring 1+ Degrees</strong></td>
<td></td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>25.0%</td>
<td>0</td>
<td>4</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

- Regionally, the number of bachelor’s degrees is increasing, and at a faster rate than the national market (71% in New England compared to 33% nationally).
- In addition, the number of institutions entering the biological sciences market in New England is increasing at a rate less than the number of degrees conferred and, therefore, is causing an increase on the average institutional conferment for colleges and universities in New England.
- The average (in terms of median and mean) institutional conferment pattern is 9 to 10 degrees per year, slightly below Unity’s target of low teens.
### Like-School Market: Bachelor’s Biological Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beloit College</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>17</td>
<td>-1</td>
<td>-20.0%</td>
<td>0</td>
<td>3</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Scripps College</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>13</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>3</td>
<td>3.8%</td>
</tr>
<tr>
<td>Pitzer College</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>31</td>
<td>-1</td>
<td>-14.3%</td>
<td>0</td>
<td>6</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beloit College</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>-1</td>
<td>-14.3%</td>
<td>0</td>
<td>3</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Scripps College</td>
<td>3.5</td>
<td>2.5</td>
<td>2.0</td>
<td>3.5</td>
<td>3.0</td>
<td>10.3</td>
<td>-1</td>
<td>-14.3%</td>
<td>0</td>
<td>3</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Pitzer College</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>13</td>
<td>-1</td>
<td>-14.3%</td>
<td>0</td>
<td>3</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Institutions Conferring 1+ Degrees</th>
<th>2</th>
<th>2</th>
<th>3</th>
<th>2</th>
<th>2</th>
<th>3</th>
<th>0</th>
<th>0.0%</th>
<th>0</th>
<th>2</th>
<th>0.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Institutions with a Positive Slope</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The like-school market is showing a flat trend; all of these schools are similar to Unity in terms of student/institutional demographics, but the sample size is so small that making a compelling case (one way or another) is difficult.
- In terms of conferment, the like-school institutional average (median and mean) is three degrees per year, and, like the market as a whole, (n=2) the trend is flat.
National “Ramp-Up Time”: Bachelor’s Biological Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>197</td>
<td>277</td>
<td>282</td>
<td>756</td>
<td>43.1%</td>
<td>43</td>
<td>252</td>
<td>16.9%</td>
</tr>
<tr>
<td>Median</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>0.0%</td>
<td>0</td>
<td>3</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mean</td>
<td>19.7</td>
<td>25.2</td>
<td>21.7</td>
<td>36.0</td>
<td>10.1%</td>
<td>1</td>
<td>22</td>
<td>4.5%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>10</td>
<td>11</td>
<td>13</td>
<td>21</td>
<td>30.0%</td>
<td>2</td>
<td>11</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging 2–22 degrees conferred per year (three-year average of the median and mean).
- Nationally, the average program size is 7–25 degrees conferred per year (slide 28). Of the 21 new programs that entered the biological sciences space, seven averaged seven degrees conferred per year (33.3%) by 2015 and five averaged 25 degrees per year (20%) by 2015.
  - For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (7–25 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems difficult within the first three years that the program is offered based on the success of other new programs—mainly only one-third graduate even half the number needed for Unity (12–14 conferrals).
Biological Science Possible Competitors

- A brief review of institutions that had conferred an undergraduate degree (previous slides) over the last five years were examined.
  - Springfield College (IPEDS regional leader)
  - Maine Maritime Academy (IPEDS regional leader)
  - Beloit College (Like-school institution)
  - Scripps College (Like-school institution)
Springfield College

- Offers a bachelor’s in biology
  - Offers a premedical scholars program in addition to the biology program
- Tuition (full time): $1,050/credit. Annual full-time tuition $34,980 with the average aid amount of $25,000 (grants, scholarships, and loans)
- Length of program: 120 credit hours
- Curriculum consists of a diverse liberal arts core, free and major electives, a GPA of 2.0 or higher, and a 60-credit residency requirement (15 of the last 30).
  - “Through electives, students have the opportunity to tailor the major toward what interests them—from human anatomy to plant science to cell biology to chemistry.”
- Springfield confers both in the 26.9999 and 26.0101 CIP codes for a total of ~20 degrees/year with three quarters in the 26.999 discipline.
Maine Maritime Academy

- Offers a bachelor’s in marine biology in the ocean studies department
- Tuition (full time): $345/credit in state, $515/credit New England, $765/credit out of state. Annual full-time tuition range of $10,050–$23,130
- Length of program: 124 credit hours
- Curriculum consists of a pretty prescriptive course sequence and a GPA of 2.0 or higher. The major provides instruction in biology, ecology, physiology, cell biology, and genetics.
- Graduates pursue graduate education and careers in fisheries, aquaculture, environmental management, consulting, and education.
- “Students may elect to take the AAUS Scientific Diving course, designed to acquaint certified recreational divers with multiple and practical scientific diving techniques.”
- Can complete a dual-degree program in marine biology and an associate’s degree in small-vessel operations.
Beloit College

- Offers a bachelor’s in biology with three concentrations: ecology, environmental, and molecular.
- Tuition (full time): Annual tuition of $46,596
- Length of program: 13.5 units for the major (one course = one unit)
- Curriculum consists of the liberal arts self-designed core, four or five breadth courses in biology, three courses in chemistry and mathematics, and a capstone course in addition to courses specific to their concentration. Courses taken at field stations can satisfy course requirements.
- Courses in biology are taught in cooperative/collaborative groups and include undergraduate research projects.
- “In the last 10 years 50% of graduates go onto graduate programs, 20% to professional schools, and the remainder went into careers including 15% into the Peace Corps.”
Scripps College

- Offers a bachelor’s in biology
- Tuition (full time): Annual tuition of $50,766
- Length of program: 14–16 courses for the major
- Curriculum consists of introduction to biology; introduction to chemistry; introduction to physics, organic chemistry, calculus, and advanced coursework in biology; and a senior thesis.

“Besides being one of the traditional preparatory fields for those pursuing careers as healthcare professionals, biology is an excellent choice of major for those interested in secondary education or in the burgeoning genetic engineering industry. And, of course, the areas of academic and industrial research are open to those who pursue a PhD in the discipline.”
Competitor Summary for Bachelor’s Biological Science

- **Concentrations/Specializations:** Of the programs reviewed, emphases include marine, environmental, ecology, and molecular. Springfield College offers a health services tract for biology majors. As an “other” CIP discipline, it is not surprising that a variety of disciplines/concentrations are offered in addition to regular biology.

- **Student-Credit Hours:** Differences in curriculum requirements (student credit versus unit hours) make time-to-degree comparison difficult. That being said, nothing suggests anything beyond the traditional four-year undergraduate experience. In fact, most offer degree plans/requirements suggesting four years of study.

- **Cost:** With three of our institutions profiled being private, the true cost of attendance is difficult to determine (discount rate). The current published rate ranges between $35,000 and $50,000, without room and board, annually.

- **Other Program Nuances:** Most of the programs suggest students will go on to graduate school (or professional school), not uncommon to biology programs. Springfield College offers a specialized track for medical professions. Maine Maritime Academy offers a dual degree program in vessel operations.
Bachelor’s in Biological Science Implications

- **Student Demand**: From a demand perspective there seems to be an opportunity. By zooming in closer and closer (national to regional, regional to new institutions to the market), the trends become consistent regarding student demand. Even as more institutions enter the market, the average (median/mean) institutional conferment continues to increase, albeit slightly. That being said, the average conferment pattern is below the level suggested by Unity in terms of critical mass.

- **Employment**: The growth in job postings for science and research is growing faster in New England than the nation as a whole at the undergraduate degree level. Many of the skills that employers are looking for are divided between technical (discipline specific) and soft skills, i.e., software, communication, management, etc.

- **Competition**: After reviewing a few competitors, just at the topline level, there is nothing in the market currently to suggest saturation, or that another provider cannot enter the space, especially locally. That being said, how does the Unity option stick out amongst all the biology/biomedical sciences options currently in existence?

- **Overall**: Even with a strong go-to-market strategy and institutional commitment from Unity, the data do not suggest that return on investment for a nonstandard biology program would be a success in terms of enrollment. Instead, retooling the current biology program to be more inline with the market in terms of messaging, experience, and outcomes has more potential than adding another flavor of biology.
Natural Sciences
Bachelor’s of Natural Sciences

- CIP code 30.1801 (Natural Sciences)
  - A program with a combined or undifferentiated focus on one or more of the physical and biological sciences
### National Market: Bachelor’s Natural Sciences

#### Institutions Conferring 1+ Degrees

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>502</td>
<td>576</td>
<td>812</td>
<td>838</td>
<td>688</td>
<td>3,416</td>
<td>186</td>
<td>37.1%</td>
<td>63</td>
<td>683</td>
<td>9.3%</td>
</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>11</td>
<td>2</td>
<td>57.1%</td>
<td>0</td>
<td>4</td>
<td>10.5%</td>
</tr>
<tr>
<td>Mean</td>
<td>10.9</td>
<td>11.8</td>
<td>14.0</td>
<td>15.0</td>
<td>14.3</td>
<td>40.7</td>
<td>3</td>
<td>31.3%</td>
<td>1</td>
<td>13</td>
<td>7.6%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>46</td>
<td>49</td>
<td>58</td>
<td>56</td>
<td>48</td>
<td>84</td>
<td>2</td>
<td>4.3%</td>
<td>1</td>
<td>51</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

- Total number of natural sciences bachelor’s degrees conferred in the US increased 37% in 2015 versus 2011 (represents 63 additional degrees annually on average).
- The number of institutions offering a bachelor’s degree in natural sciences is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a natural sciences degree is not entirely responsible for the demonstrated increase in degrees conferred (suggests increased student demand is driving most of the growth).
- Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 4 to 13 degrees per year.
- Similar to the conferment trend in general, more institutions (56%) are experiencing an increase in their average annual number of degrees conferred than those showing a decline.
## New England Market: Bachelor’s Natural Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>MA</td>
<td>19</td>
<td>32</td>
<td>29</td>
<td>80</td>
<td>29</td>
<td>103</td>
<td>5</td>
<td>-100.0%</td>
<td>5</td>
<td>27</td>
<td>18.8%</td>
</tr>
<tr>
<td>Lyndon State College</td>
<td>VT</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>13</td>
<td>-3</td>
<td>-1</td>
<td>-100.0%</td>
<td>3</td>
<td>3</td>
<td>-21.5%</td>
</tr>
<tr>
<td>Castleton State College</td>
<td>VT</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>9</td>
<td>-3</td>
<td>-100.0%</td>
<td>3</td>
<td>-28.6%</td>
<td>3</td>
<td>3</td>
<td>-28.6%</td>
</tr>
<tr>
<td>Bard College at Simon’s Rock</td>
<td>MA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td></td>
<td>6</td>
<td>11</td>
<td>21</td>
<td>35</td>
<td>103</td>
<td>24</td>
<td>400.0%</td>
<td></td>
<td>7</td>
<td>21</td>
<td>35.0%</td>
</tr>
</tbody>
</table>

**Median**

|      | 3    | 6    | 11   | 2    | 15   | 11   | 12              | 400.0%           |                   | 2     | 7    | 28.5%     |

**Mean**

|      | 3.0  | 5.5  | 10.5  | 11.7 | 15.0 | 25.8 | 12              | 400.0%           |                   | 3     | 9    | 33.0%     |

**Institutions Conferring 1+ Degrees**

|      | 2    | 2    | 2     | 3    | 2    | 4    | 0               | 0.0%             |                   | 0     | 2    | 4.5%      |

### Observations

- Regionally, the number of bachelor’s degrees is increasing, albeit at a noticeably faster rate than the national market.
- In addition, the number of institutions entering the natural sciences market in New England is increasing at a rate less than the number of degrees conferred and, therefore, is causing an increase on the average institutional conferment for colleges and universities in New England.
  - Most of the market and average institutional growth is a result of Harvard entering the market in 2013.
- The average (in terms of median and mean) institutional conferment pattern is seven to nine degrees per year.
## Like-School Market: Bachelor’s Natural Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>#/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doane College-Crete</td>
<td>NE</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>400.0%</td>
<td>1</td>
<td>2</td>
<td>3.1%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Johnson C Smith University</td>
<td>NC</td>
<td>4</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td>-4</td>
<td>-100.0%</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central College</td>
<td>IA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td>3</td>
<td>-1</td>
<td>-100.0%</td>
<td>0</td>
<td>1</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td></td>
<td>6</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>16</td>
<td>-16.7%</td>
<td>0</td>
<td>3</td>
<td>3.1%</td>
<td></td>
</tr>
</tbody>
</table>

|               | Median |      |      |      |      |      |      |               |                  |                  |
|---------------|--------|------|------|------|------|------|----------------|-------------------|------------------|
|               | Mean   | 2.0  | 1.0  | 1.5  | 5.0  | 5.3  | 3              | 150.0%            | 1                 |
| Institutions Conferring 1+ Degrees | 3 | 0 | 2 | 2 | 1 | 3 | -2 | -66.7% | 0 |

| # of Institutions with a Positive Slope | 1 |
| # of Institutions with a Negative Slope | 0 |

- Again, the like-school general market is showing an upward trend, but the sample size is so small that making a compelling case (one way or another) is difficult.
- In terms of conferment, the like-school institutional average (median and mean) is two degrees per year but trending up, mainly because of Johnson C. Smith University leaving the market.
National “Ramp-Up Time”: Natural Sciences

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th># Change from 2013</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>232</td>
<td>257</td>
<td>241</td>
<td>730</td>
<td>9</td>
<td>3.9%</td>
<td>5</td>
<td>243</td>
<td>1.8%</td>
</tr>
<tr>
<td>Median</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>300.0%</td>
<td>3</td>
<td>5</td>
<td>56.3%</td>
</tr>
<tr>
<td>Mean</td>
<td>17.8</td>
<td>17.1</td>
<td>18.5</td>
<td>30.4</td>
<td>1</td>
<td>3.9%</td>
<td>0</td>
<td>18</td>
<td>1.9%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>13</td>
<td>15</td>
<td>13</td>
<td>24</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>14</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging 5–18 degrees conferred on average per year (three-year average of the median and mean).

- Nationally, the average program size is 4–13 degrees conferred per year (slide 41). Of the 24 new programs that entered the natural sciences space, 10 averaged four degrees conferred per year (42%) by 2015 and five had averaged 13 degrees per year (38%) by 2015.

- For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (4–13 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems obtainable within the first three years that the program is offered based on the success of other new programs, but it is far from certain.
Natural Science Possible Competitors

- A brief review of institutions that had conferred an undergraduate degree (previous slides) over the last five years were examined.
  - Lyndon State College (IPEDS regional leader)
  - Doane University; listed as Doane College—Crete in IPEDS (like-school institution)
Lyndon State College

- Offers a bachelor’s in natural sciences with three concentrations, including natural sciences, environmental studies, and sustainability studies
  - Offers medical career tracks within the natural sciences, including pre-dental, premed, and premedical technology
- Tuition (full time): Annual tuition range of $10,224 (in state) to $21,912 (out of state). Competitive financial aid and scholarship options for qualified out-of-state students, adding up to as much as $12,076 in savings on tuition
- Length of program: 42 credit hours for the major
- “New science students will immediately form a problem-solving team with faculty to begin addressing some of the most important environmental issues facing us today, from keeping our water supplies clean to coping with climate change.”
Doane College

- Offers a bachelor’s in natural sciences as an interdisciplinary program between the College of Arts and Sciences and Department of Education
- Program is offered exclusively at the Crete, NE, main campus
- Tuition (part time): $890/credit hour
- Curriculum is hard to identify since it is primarily a teaching endorsement program. The specifics of the natural sciences piece is difficult to find.
  - “Broadly based Bachelor of Science degree program for student seeking a general education in science and the Science Field Endorsement”
    - Meets the requirements for certification to teach biology, chemistry, physics, and earth science in grades 7–12 in Nebraska
  - “Doane University GUARANTEES its teacher education students employment following graduation in the education field.”
Competitor Summary for Bachelor’s Natural Science

- **Concentrations/Specializations**: With one of the programs providing special attention to preparing secondary school teachers, a comparison is difficult. Lyndon State College offers three different concentrations in the natural sciences department with equal success among all three disciplines. Despite having different foci, both programs prepare graduates with a wide cross-section of science options.

- **Student-Credit Hours**: Nothing suggests anything beyond the traditional four-year undergraduate program. In fact, both degree plans/requirements suggest a four-year (full-time) time to degree. Doane College, despite being a like-Unity school, suggests part-time attendance for a large population of their students given the pricing structure and campus-location-specific program.

- **Cost**: Assuming 15 credits hour/semester constitutes full-time study, both programs are between $20,000 and $25,000/year for full-time study—less if students are in-state or New England residents for Lyndon State College, annually.

- **Other Program Nuances**: Lyndon State College, the most likely competitor for any new program related to natural science, offers a similar experiential learning experience as Unity College at a reduced rate. Doane College, as primarily a teacher-preparation program, is not considered.
Bachelor’s in Natural Science Implications

- **Student Demand**: From a demand perspective there seems to be an opportunity. By zooming in closer and closer (national to regional, regional to new institutions to the market), the trends become consistent regarding student demand. Even as more institutions enter the market the average (median/mean) institutional conferment continues to increase, albeit slightly. That being said, the average conferment pattern is below the level suggested by Unity in terms of critical mass, especially in New England and with the like-school market.

- **Employment**: The growth in job postings for science and research is growing faster in New England than the nation as a whole at the undergraduate-degree level. Many of the skills that employers are looking for are divided between technical (discipline specific) and soft skills, i.e., software, communication, management, etc.

- **Competition**: After reviewing two competitors (not many identified via IPEDS data that are doing anything substantial), there is nothing in the market currently to suggest saturation, or that another provider cannot enter the space, especially locally. That being said, is a natural sciences program (not involving education) a big enough appeal to attend Unity College? Probably not.

- **Overall**: Even with a strong go-to-market strategy and institutional commitment from Unity, the data do not suggest that return on investment for a general sciences program would be a success in terms of enrollment.
Chemistry
Bachelor’s of Chemistry

- CIP code 40.0501 (Chemistry, General)
  - A general program that focuses on the scientific study of the composition and behavior of matter, including its micro- and macro-structure, the processes of chemical change, and the theoretical description and laboratory simulation of these phenomena.
Total number of chemistry bachelor’s degrees conferred in the US increased nearly 14% in 2015 versus 2011 (represents 452 additional degrees annually on average).

The number of institutions offering a bachelor’s degree in chemistry is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a chemistry degree is not entirely responsible for the demonstrated increase in degrees conferred (suggesting increased student demand is driving most of the growth).

Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of mean only) institutional conferment pattern has been increasing and is currently at 7 to 13 degrees per year.

Similar to the conferment trend in general, nearly 60% of institutions are experiencing an increase in their average annual number of degrees conferred.

### National Market: Bachelor’s Chemistry

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>13,022</td>
<td>13,823</td>
<td>14,196</td>
<td>14,733</td>
<td>14,829</td>
<td>70,603</td>
<td>1,807</td>
<td>13.9%</td>
<td>452</td>
<td>14121</td>
<td>3.2%</td>
</tr>
<tr>
<td>Median</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>7</td>
<td>35</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>7</td>
<td>0.0%</td>
</tr>
<tr>
<td>Mean</td>
<td>12.5</td>
<td>13.2</td>
<td>13.3</td>
<td>13.8</td>
<td>13.8</td>
<td>61.6</td>
<td>1</td>
<td>10.7%</td>
<td>0</td>
<td>13</td>
<td>2.5%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>1,043</td>
<td>1,049</td>
<td>1,068</td>
<td>1,070</td>
<td>1,073</td>
<td>1,146</td>
<td>30</td>
<td>2.9%</td>
<td>8</td>
<td>1061</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

- # of Institutions with a Positive Slope: 622
- # of Institutions with a Negative Slope: 432
## Largest Regional Providers: Bachelor’s Chemistry

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Massachusetts Amherst</td>
<td>MA</td>
<td>39</td>
<td>40</td>
<td>32</td>
<td>30</td>
<td>32</td>
<td>173</td>
<td>-7</td>
<td>-17.9%</td>
<td>-2</td>
<td>35</td>
<td>-6.9%</td>
</tr>
<tr>
<td>Northeastern University</td>
<td>MA</td>
<td>25</td>
<td>36</td>
<td>37</td>
<td>34</td>
<td>36</td>
<td>168</td>
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<td>34</td>
<td>6.0%</td>
</tr>
<tr>
<td>College of the Holy Cross</td>
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<td>20</td>
<td>38</td>
<td>32</td>
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<td>43</td>
<td>168</td>
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<td>4</td>
<td>34</td>
<td>12.8%</td>
</tr>
<tr>
<td>Williams College</td>
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<td>26</td>
<td>28</td>
<td>31</td>
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<td>44</td>
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<td>4</td>
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<td>13.3%</td>
</tr>
<tr>
<td>University of Connecticut</td>
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<td>29</td>
<td>28</td>
<td>33</td>
<td>32</td>
<td>41</td>
<td>163</td>
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<td>8.6%</td>
</tr>
<tr>
<td>Harvard University</td>
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<td>21</td>
<td>25</td>
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<td>2.9%</td>
<td>1</td>
<td>29</td>
<td>4.4%</td>
</tr>
<tr>
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<td>28</td>
<td>24</td>
<td>23</td>
<td>21</td>
<td>32</td>
<td>128</td>
<td>4</td>
<td>14.3%</td>
<td>1</td>
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<td>2.0%</td>
</tr>
<tr>
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<td>17</td>
<td>19</td>
<td>22</td>
<td>27</td>
<td>38</td>
<td>123</td>
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<td>123.5%</td>
<td>5</td>
<td>25</td>
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</tr>
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<td>21</td>
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<td>24</td>
<td>7.8%</td>
</tr>
<tr>
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<td>11</td>
<td>19</td>
<td>33</td>
<td>23</td>
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<td>121</td>
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<td>24</td>
<td>21.5%</td>
</tr>
<tr>
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<td>26</td>
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<td>-4.8%</td>
<td>1</td>
<td>22</td>
<td>-4.5%</td>
</tr>
<tr>
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<td>16</td>
<td>20</td>
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<td>31</td>
<td>110</td>
<td>15</td>
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<td>3</td>
<td>22</td>
<td>11.4%</td>
</tr>
<tr>
<td>Wellesley College</td>
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<td>15</td>
<td>22</td>
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<td>12</td>
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<td>0</td>
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<td>-2.1%</td>
</tr>
<tr>
<td>Brown University</td>
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<td>14</td>
<td>24</td>
<td>17</td>
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<td>94</td>
<td>4</td>
<td>28.6%</td>
<td>1</td>
<td>19</td>
<td>2.7%</td>
</tr>
<tr>
<td>Yale University</td>
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<td>20</td>
<td>22</td>
<td>17</td>
<td>13</td>
<td>21</td>
<td>93</td>
<td>1</td>
<td>5.0%</td>
<td>-1</td>
<td>19</td>
<td>-3.8%</td>
</tr>
<tr>
<td>Wesleyan University</td>
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<td>11</td>
<td>18</td>
<td>26</td>
<td>14</td>
<td>24</td>
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<td>19</td>
<td>11.8%</td>
</tr>
<tr>
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<td>10</td>
<td>12</td>
<td>16</td>
<td>35</td>
<td>19</td>
<td>92</td>
<td>9</td>
<td>90.0%</td>
<td>4</td>
<td>18</td>
<td>22.3%</td>
</tr>
<tr>
<td>Dartmouth College</td>
<td>NH</td>
<td>9</td>
<td>24</td>
<td>14</td>
<td>22</td>
<td>19</td>
<td>88</td>
<td>10</td>
<td>111.1%</td>
<td>2</td>
<td>18</td>
<td>10.2%</td>
</tr>
<tr>
<td>Smith College</td>
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<td>14</td>
<td>17</td>
<td>12</td>
<td>20</td>
<td>23</td>
<td>86</td>
<td>9</td>
<td>64.3%</td>
<td>2</td>
<td>17</td>
<td>12.2%</td>
</tr>
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<td>10</td>
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<td>18</td>
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<td>0</td>
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<td>-0.6%</td>
</tr>
<tr>
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<td>15</td>
<td>14</td>
<td>16</td>
<td>14</td>
<td>17</td>
<td>76</td>
<td>2</td>
<td>13.3%</td>
<td>0</td>
<td>15</td>
<td>2.6%</td>
</tr>
<tr>
<td>University of New Hampshire—Main Campus</td>
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<td>12</td>
<td>15</td>
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<td>17</td>
<td>76</td>
<td>6</td>
<td>54.5%</td>
<td>2</td>
<td>15</td>
<td>13.8%</td>
</tr>
<tr>
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<td>16</td>
<td>73</td>
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<td>14.3%</td>
<td>1</td>
<td>15</td>
<td>3.4%</td>
</tr>
<tr>
<td>Mount Holyoke College</td>
<td>MA</td>
<td>15</td>
<td>11</td>
<td>22</td>
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<td>10</td>
<td>69</td>
<td>-5</td>
<td>-33.3%</td>
<td>-1</td>
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<tr>
<td>University of Massachusetts—Lowell</td>
<td>MA</td>
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<td>5</td>
<td>35.7%</td>
<td>1</td>
<td>13</td>
<td>10.8%</td>
</tr>
</tbody>
</table>
New England Market: Bachelor’s Chemistry

Regionally, the number of bachelor’s degrees is increasing, albeit at a faster rate than the national market.

In addition, the number of institutions entering the chemistry market in New England is decreasing and, therefore, is causing an increase on the average institutional conferment for colleges and universities in New England.

The average (in terms of median and mean) institutional conferment pattern is 9 to 11 degrees per year.

Based on national incidence levels for bachelor’s degrees in chemistry, there could be as many as 53 additional bachelor’s degrees in chemistry to be conferred in New England each year.
Like-School Market: Bachelor’s Chemistry

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>188</td>
<td>186</td>
<td>187</td>
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<td>1.6%</td>
<td>-1</td>
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</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>18</td>
<td>0</td>
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<td>-1</td>
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<td>-2.3%</td>
</tr>
<tr>
<td>Mean</td>
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<td>6.4</td>
<td>5.9</td>
<td>6.2</td>
<td>28.8</td>
<td>-1</td>
<td>-8.2%</td>
<td>0</td>
<td>6</td>
<td>-3.0%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
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<td>28</td>
<td>29</td>
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<td>31</td>
<td>32</td>
<td>3</td>
<td>10.7%</td>
<td>1</td>
<td>29</td>
<td>2.4%</td>
</tr>
<tr>
<td># of Institutions with a Positive Slope</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- The similar-school general market is showing a downward trend, and considering all of these schools are similar to Unity in terms of student/institutional demographics, it could be troubling in terms of a new program opportunity.

- In terms of conferment, the like-school institutional average (median and mean) is between four and six degrees per year, and decreasing. That being said, with more institutions showing growth than those showing a decline, the trend is surprising.

  - A further review of like-school conferment patterns shows that most schools that are positive have a growth in degrees conferred between .2 and .5 degrees per year, while schools showing a decline are showing larger declines (around one or two degrees per year).
### National “Ramp-Up Time”: Bachelor’s Chemistry

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th># Change from 2013</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
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</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
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<td>257</td>
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<td>33.9%</td>
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</tr>
<tr>
<td>Median</td>
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<tr>
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<td>6.8</td>
<td>7.6</td>
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<td>15.3</td>
<td>1</td>
<td>13.8%</td>
<td>0</td>
<td>7</td>
<td>6.4%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>34</td>
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<td>52</td>
<td>6</td>
<td>17.6%</td>
<td>3</td>
<td>36</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

- # of Institutions with a Positive Slope: 15
- # of Institutions with a Negative Slope: 11

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging three to seven degrees conferred on average per year (three-year average of the median and mean).

- Nationally, the average program size is 7–13 degrees conferred per year (slide 52). Of the 52 new programs that entered the chemistry space, 11 averaged seven degrees conferred per year (21%) by 2015 and seven had averaged 13 degrees per year (13%) by 2015.

- For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (7–13 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems difficult within the first three years that the program is offered based on the success of other new programs.
Of the 2,685 job postings in 2016 for chemistry, 1,901 (70%) were tied to a specific employer or type of industry. A total of 56 different segments were indicated. The largest segments are presented above.

Given the narrow focus of most chemistry programs, it is not surprising that most industries hiring chemistry-related professionals are in a field directly or indirectly tied to chemistry, and more specifically, the lab experience of a chemistry program.
**Chemistry Bachelor’s Skills**

**The top skills for chemistry in the New England region**

- **Chemistry** (58%)
- Biology (20%)
- High-Performance Liquid Chromatography (20%)
- Biochemistry (19%)
- Medical Technology (19%)
- Experiments (18%)
- Analytical Chemistry (14%)
- Microsoft Excel (13%)
- Laboratory Testing (13%)
- Biotechnology (13%)
- Validation (12%)
- Data Analysis (11%)
- Good Manufacturing Practices (GMP) (11%)

- Most (97%) of the job postings in 2016 for chemistry listed specific skills necessary (or preferred) for the positions. A total of 200 unique skills were indicated. The most popular skill sets are presented above.

- With the exception of Microsoft Excel and Good Manufacturing Practices (GMP), many of the skills needed for bachelor’s-level chemistry jobs in the New England area are more technical (chemistry, biology, biochemistry) than soft skills.
Chemistry Possible Competitors

- A brief review of institutions that had conferred an undergraduate degree (previous slides) over the last five years were examined.
  - Williams College (IPEDS private school regional leader)
  - College of the Holy Cross (IPEDS private school regional leader)
  - Kalamazoo College (like-school institution leader)
  - Haverford College (like-school institution leader)
  - Albion College (like-school institution leader)
Williams College

- Offers a bachelor’s in chemistry, also has an honors option involving a thesis
- Students interested in chemistry need to take a pre-enrollment placement examination (not just a test) prior to registering for the first block of foundation courses.
- Exchange and transfer students need to meet with a faculty member prior to attendance
- Tuition (full time): $53,240 annual tuition charge
- Curriculum consists of the foundational courses in chemistry, followed by their specific emphasis: biochemistry, material sciences, organic chemistry, and physical chemistry
- Program suggests a high level of academic rigor and preparation
College of the Holy Cross

- Offers a bachelor’s in chemistry with an optional biochemistry concentration
- “Chemistry Department has been experimenting since 1989 with a laboratory-based, process-oriented curriculum called Discovery Chemistry.”
- Tuition (full time): $49,980 annual tuition charge
- Curriculum consists of nine foundational chemistry courses as well as coursework in physics and math
  - Flexible major allows students to be accredited by the American Chemical Society
  - Offers option to be certified as a middle or high school chemistry teacher in the state of MA
- Undergraduate research opportunities in coordination with a faculty member exist for students.
- “The chemistry department is among the nation’s top producers of chemistry graduates and a top baccalaureate origin for PhDs in chemistry.”
Kalamazoo College

- Offers a bachelor’s in chemistry
  - Offers a 3/2 pre-engineering/chemical engineering program
  - Offers biochemistry and molecular biology concentration
- Tuition (full time): $44,414 annual tuition charge
- Curriculum consists of nine courses in chemistry plus course work in calculus and physics
- Current enrollment suggests (based on class listings) enrollments significantly higher than degree conferral (over 35 students per class)
- Program boasts as a preparation for graduate/professional school. “In a recent national survey, K college ranked 8th nationally in the number of students who earned PhDs in chemistry compared to other baccalaureate institutions.”
Haverford College

- Offers a bachelor’s in chemistry
- “The program in chemistry is designed to meet the needs of students who are pursuing chemistry as part of a pre-professional course or to increase their knowledge of the natural sciences.”
- Tuition (full time): $50,564 annual tuition charge
- Curriculum includes 11 courses in chemistry plus one advanced math course and two courses in either biology or physics
- “As seniors, majors participate in high-level research tutorial courses in which they engage in directed research on a particular topic under the guidance of a faculty member.”
- “Some of the most exciting areas in science today are found in the interdisciplinary fields of chemical physics, chemical biology, theoretical/computational chemistry, environmental studies, and materials science.”
The Department of Chemistry at Albion College offers four degree programs: American Chemical Society-certified BS, a BA in biochemistry, a BA in chemistry, and a BA in chemistry with secondary education certification.

- Tuition (full time): $42,560 annual tuition charge
- The major requires a minimum of 10 courses plus coursework in several cognate areas.
- Prepares students for a wide range of careers including graduate/professional school and health professions
- “The faculty in the chemistry department believe that involving students in research is as important to their education as classroom work.”
Competitor Summary for Bachelor’s Chemistry

- **Concentrations/Specializations**: Biochemistry and molecular biology are concentration options, as is the opportunity to earn your secondary education certification. Despite the various concentration options, most of the chemistry programs reviewed suggest a higher level of academic ability and preparation. Graduate/professional school were the primary outcomes emphasized by each program.

- **Student-Credit Hours**: Nothing suggests anything beyond the traditional four-year undergraduate experience. In fact, most offer degree plans/requirements suggesting four years of full-time study.

- **Cost**: With all of the institutions profiled being private, the true cost of attendance is difficult to determine (discount rate). The current published rate ranges between $42,000 (Albion) and $53,000 (Williams College), without room and board annually.

- **Other Program Nuances**: Research opportunities for undergraduates were prolific and diverse. Some schools (Holy Cross for example) did a better job providing concrete examples, but clearly the opportunity for undergraduates to conduct hands-on research outside of the curriculum is important. Holy Cross’s “Discovery Chemistry” educational philosophy is most similar to the current Unity College educational experience.
Bachelor’s in Chemistry Implications

- **Student Demand:** From a demand perspective there might be an opportunity. As a more narrowly focused program than others considered, Stamats feels confident stating that although the program may not generate the enrollment needed by Unity (10–12 degrees conferred annually) initially, it could achieve that over time considering the positive trends (like-school market was essentially flat).

- **Employment:** The growth in job postings for science and research is growing faster in New England than the nation as a whole at the undergraduate-degree level. Many of the skills that employers are looking for in chemistry are more technical (discipline specific) than soft skills. Considering the type of employers for chemistry undergraduates (pharmaceuticals and labs), that is not surprising.

- **Competition:** Obviously chemistry is one of those programs that every institution seems to have at least a basic understanding of (general education requirements), but not necessarily a major. Of the programs reviewed briefly, most are taking the graduate/professional-school-preparation approach for their students. Could an opportunity for an institution to jump in (recent success suggests there is more demand for chemistry than the current market is providing) and specifically target those students looking for a more applied vocational/career experience?

- **Overall:** Even with a strong go-to-market strategy, and institutional commitment from Unity, the immediate return on investment may be difficult for Unity. In addition, considering how Unity has done offering their own version of popular majors, like biology for example, it may be another point of caution regarding the enrollment potential for Unity in a standard program like chemistry.
Geology
Bachelor’s of Geology/Earth Science

- CIP code 40.0601 (Geology/Earth Science, General)
  - A program that focuses on the scientific study of the earth; the forces acting upon it; and the behavior of the solids, liquids and gases comprising it. Includes instruction in historical geology, geomorphology, and sedimentology, the chemistry of rocks and soils, stratigraphy, mineralogy, petrology, geostatistics, volcanology, glaciology, geophysical principles, and applications to research and industrial problems.
Total number of geology bachelor’s degrees conferred in the US is increasing strongly—nearly 40% increase in 2015 versus 2011 (represents 381 additional degrees annually on average).

The number of institutions offering a bachelor’s degree in geology is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a geology degree is not entirely responsible for the demonstrated increase in degrees conferred (suggesting increased student demand is driving most of the growth).

Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 10 to 12 degrees per year.

Similar to the conferment trend in general, nearly 75% of institutions are experiencing an increase in their average annual number of degrees conferred.
## Largest Regional Providers: Bachelor’s Geology

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
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<th>Slope/ Mean</th>
</tr>
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<tbody>
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<td>University of Massachusetts Amherst</td>
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</table>
New England Market: Bachelor’s Geology

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<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
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<td>1,438</td>
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<td>14.0%</td>
<td>8</td>
<td>288</td>
<td>2.8%</td>
</tr>
<tr>
<td>Median</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>38</td>
<td>2</td>
<td>33.3%</td>
<td>1</td>
<td>7</td>
<td>7.1%</td>
</tr>
<tr>
<td>Mean</td>
<td>7.8</td>
<td>8.6</td>
<td>7.0</td>
<td>9.5</td>
<td>9.7</td>
<td>38.9</td>
<td>2</td>
<td>24.7%</td>
<td>0</td>
<td>9</td>
<td>5.6%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>35</td>
<td>35</td>
<td>36</td>
<td>32</td>
<td>32</td>
<td>37</td>
<td>-3</td>
<td>-8.6%</td>
<td>-1</td>
<td>34</td>
<td>-2.6%</td>
</tr>
</tbody>
</table>

- Regionally, the number of bachelor’s degrees is increasing, albeit at a slower rate than the national market.
- In addition, the number of institutions entering the geology market in New England is decreasing and, therefore, this is causing an increase on the average institutional conferment for colleges and universities in New England at a rate faster than the market as a whole.
- The average (in terms of median and mean) institutional conferment pattern is seven to nine degrees per year.
- Based on national incidence levels for bachelor’s degrees in geology, there could be as many as 20 additional bachelor’s degrees in geology to be conferred in New England each year.
Again, the like-school general market is showing an upward trend, and considering all of these schools are similar to Unity in terms of student/institutional demographics, it bodes well in terms of a new program opportunity.

In terms of conferment, the like-school institutional average (median and mean) is between five and six degrees per year.
National “Ramp-Up Time”: Bachelor’s Geology

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th># Change from 2013</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>36</td>
<td>59</td>
<td>71</td>
<td>166</td>
<td>35</td>
<td>97.2%</td>
<td>18</td>
<td>55</td>
<td>31.6%</td>
</tr>
<tr>
<td>Median</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>150.0%</td>
<td>2</td>
<td>4</td>
<td>42.9%</td>
</tr>
<tr>
<td>Mean</td>
<td>3.6</td>
<td>4.9</td>
<td>6.5</td>
<td>9.2</td>
<td>3</td>
<td>79.3%</td>
<td>1</td>
<td>5</td>
<td>28.6%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>10</td>
<td>12</td>
<td>11</td>
<td>18</td>
<td>1</td>
<td>10.0%</td>
<td>1</td>
<td>11</td>
<td>4.5%</td>
</tr>
<tr>
<td># of Institutions with a Positive Slope</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging four to five degrees conferred on average per year (three-year average of the median and mean).
- Nationally, the average program size is 10–12 degrees conferred per year (slide 69). Of the 18 new programs that entered the geology space, two averaged 10–12 degrees per year (11%) by 2015.
  - For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (10–12 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems difficult within the first three years that the program is offered based on the success of other new programs.
Of the 161 job postings in 2016 for geology/earth science, less than half (47%) were tied to a specific employer or type of industry. A total of 24 different segments were indicated. The largest segments are presented above.

Given the nature of geology (rocks, dirt, natural resources, etc.), the fact that engineering, architecture, and governmental positions were top opportunities was not surprising.
Most (90%) of the job postings in 2016 for geology/earth science listed specific skills necessary (or preferred) for the positions. A total of 200 unique skills were indicated. The most popular skill sets are presented above.

- Besides technical skills (geology, environmental science, technical writing, and environmental compliance), soft skills in project management, writing, Excel, and supervision were needed for bachelor’s-level positions in geology/earth science.
Geology Possible Competitors

- A brief review of institutions that had conferred an undergraduate degree (previous slides) over the last five years were examined.
  - Amherst College (IPEDS private school regional leader)
  - Smith College (IPEDS private school regional leader)
  - Middlebury College (like-school institution leader)
  - Albion College (like-school institution leader)
  - Beloit College (like-school institution leader)
Amherst College

- Offers a bachelor’s in geology as well as an undergraduate thesis (honors) option
- “Geology field camp is an integral part of a student’s geology experience. At field camp, students spend five to six weeks outdoors, learning to interpret the geologic history and structure of natural environments.”
- Tuition (full time): $65,330 annual tuition charge including room and board
- Core curriculum is wide open, students are free to design their own curriculum to meet the necessary degree requirements, “many students double major”
- Major curriculum consists of four courses as well as additional coursework designed for the students “field of interest or future plans”
- Undergraduate research opportunities in coordination with a faculty member exist for students.
Smith College

- Offers a bachelor’s in geosciences with concentrations/degree offerings in geosciences, environmental geosciences, and geosciences education.

- Courses are hands-on and discovery-based learning with interactive student-faculty research experiences.

- Tuition (full time): $49,980 annual tuition charge

- Curriculum differs by concentration (four to eight courses in geosciences) and an optional summer geology field camp course

- Summer field camps include experiences with GSA/ExxonMobil, Juneau Icefield Research Program, and other areas focusing on hydrology, volcanology, or geophysics.

- Careers can lead to options in climate change, energy and water resources, environmental stewardship, and natural hazards.
Middlebury College

- Offers a bachelor’s in geology
- “The curriculum takes advantage of our natural setting by stressing field-oriented and laboratory-supported inquiry into problems in all facets of earth science.”
- Tuition (full time): $49,648 annual tuition charge
- Curriculum consists of nine geology courses and two additional courses in a cognate area (biology, chemistry, or physics lab courses)
- “The geology curriculum focuses on environmental geology, geomorphology, marine geology, oceanography/limnology, petrology, and tectonics.”
- “Geology majors have used their Middlebury degree as a stepping-stone to graduate school in the geosciences; to industry; to teaching careers; and to careers in environmental science, business, law, and architecture.”
The geological sciences department offers four degrees in earth science and geology. A general geology and geology with a secondary certificate in education is also offered.

“The department’s facilities include six instructional laboratories, a GIS lab, individual faculty offices and research labs, a student research lab, a map room, and a rock and fossils preparation shop.”

Tuition (full time): $42,560 annual tuition charge.

Curriculum (BA geology) consists of nine foundational geology courses one chemistry course; and one additional biology, chemistry, physics, or upper-division mathematics course.

“Over one-half of our graduates have chosen to continue studying geology or other disciplines, including business, law, medicine, and public policy, at major universities and have obtained master’s or doctoral degrees before beginning their careers.”
Beloit College

- Offers a bachelor’s in geology and environmental geology
- Offers a variety of international and national study abroad/exchange programs to study geology beyond the Beloit College campus
- Tuition (full time): Annual tuition of $46,596
- Length of geology program is 12 units and environmental geology is 13 units for the major (one course = one unit)
- Beyond the self-designed liberal arts curriculum, the major consists of coursework in geology, biology, physics, and a senior thesis.
- “We strive to prepare students to be competent professionals in geology, capable of pursuing graduate studies and/or careers in the earth sciences and related disciplines.”
Competitor Summary for Bachelor’s Geology

- **Concentrations/Specializations**: In addition to geology, other specializations/concentrations include earth science, geosciences, environmental geosciences/geology, and education. Although some schools appear to report degree-conferral data by the specialization/concentration, it is hard to tell what effect, if any, having multiple concentrations does or does not do in terms of enrollment. Educational preparation programs differ significantly from the science-based programs.

- **Student-Credit Hours**: Nothing suggests anything beyond the traditional four-year undergraduate experience. In fact, most offer degree plans/requirements suggesting four years of study.

- **Cost**: With three of our institutions profiled being private, the true cost of attendance is difficult to determine (discount rate). The current published rate ranges between $42,000 and $50,000, without room and board, annually for four of the five profiled institutions. Amherst College listed cost of attendance as $65,000 with room and board.

- **Other Program Nuances**: Although graduate/professional school is an option for graduates, geology programs appear more focused on graduates pursuing careers related directly (geological sciences) or indirectly (climate change, policy) to their program.
Bachelor’s in Geology Implications

- **Student Demand**: Despite positive trends at all levels (national, regional, like-school, and new to market), the average program size continues to decrease from around 10–12 at the national level to most new programs conferring four to five students. The smaller average conferment patterns make it difficult from a return-on-investment standpoint to launch a new program.

- **Employment**: The growth in job postings for science and research is growing faster in New England than the nation as a whole at the undergraduate-degree level. Many of the skills that employers are looking for in undergraduate geology/earth science positions are divided between technical (discipline specific) and soft skills, i.e., Excel, management, supervisory, etc.

- **Competition**: After reviewing a few competitors, just at the topline level, there is nothing in the market currently to suggest saturation, however, there are currently six other competitors in Maine (three privates and three publics) offering a geology program. Of the six competitors, only Bowdoin College is currently conferring at a level needed for Unity College.

- **Overall**: Despite an obvious connection with sustainability and physical science, geology just looks like too small of an opportunity, and given the dollars needed to develop a program, the return on investment just does not seem to be there in terms of enrollment potential.
Sustainable Business Enterprise
Bachelor’s of Sustainable Business

- CIP code 52.0201 (Business Administration and Management, General)
  - A program that generally prepares individuals to plan, organize, direct, and control the functions and processes of a firm or organization. Includes instruction in management theory, human resources management and behavior, accounting and other quantitative methods, purchasing and logistics, organization and production, marketing, and business decision making.

Because Unity College asked us to explore ecotourism in combination with a bachelor’s in sustainable business, Stamats felt at least a cursory look at this CIP code, in conjunction with 52.0201, was prudent:

- CIP code 52.0903 (Tourism and Travel Management)
  - A program that prepares individuals to manage travel-related enterprises and related convention and/or tour services. Includes instruction in travel agency management, tour arranging and planning, convention and event planning, travel industry operations and procedures, tourism marketing and promotion strategies, travel counseling, travel industry law, international and domestic operations, and travel and tourism policy.
National Market: Bachelor’s Business

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th>% Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
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<td>144,268</td>
<td>142,473</td>
<td>140,003</td>
<td>139,875</td>
<td>712,286</td>
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<td>-4.0%</td>
<td>-1585</td>
<td>142457</td>
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</tr>
<tr>
<td>Median</td>
<td>42</td>
<td>38</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>153</td>
<td>-5</td>
<td>-11.9%</td>
<td>-1</td>
<td>38</td>
<td>-3.2%</td>
</tr>
<tr>
<td>Mean</td>
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<td>91.5</td>
<td>86.7</td>
<td>87.0</td>
<td>88.4</td>
<td>386.7</td>
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<td>-6.9%</td>
<td>-2</td>
<td>90</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>1,534</td>
<td>1,577</td>
<td>1,644</td>
<td>1,609</td>
<td>1,582</td>
<td>1,842</td>
<td>48</td>
<td>3.1%</td>
<td>13</td>
<td>1589</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

- Total number of business administration bachelor’s degrees conferred in the US is decreasing slightly—nearly 4% decrease in 2015 versus 2011 (represents 1,585 fewer degrees annually on average).
- The number of institutions offering a business administration degree is increasing slightly. Coupled with the average conferral by institution trending downward, nationally the market may be fully absorbed, and institutional growth can only result in further fragmentation of the market versus increased student demand.
- Due to the relationship between overall market decline and the number of institutions entering the market, the average (in terms of median and mean) institutional-conferment pattern has been decreasing at a rate greater than twice the market as a whole, and is currently at 38 to 90 degrees per year.
- Similar to the conferment trend in general, nearly 60% of institutions are experiencing a decrease in their average annual number of degrees conferred.
## Largest Regional Providers: Bachelor’s Business

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>State</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston University</td>
<td>MA</td>
<td>682</td>
<td>662</td>
<td>626</td>
<td>760</td>
<td>775</td>
<td>3,505</td>
<td>93</td>
<td>13.6%</td>
<td>28</td>
<td>701</td>
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</tr>
<tr>
<td>Southern New Hampshire University</td>
<td>NH</td>
<td>482</td>
<td>423</td>
<td>507</td>
<td>556</td>
<td>775</td>
<td>2,743</td>
<td>293</td>
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<td>72</td>
<td>549</td>
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</tr>
<tr>
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<td>423</td>
<td>477</td>
<td>619</td>
<td>470</td>
<td>655</td>
<td>2,644</td>
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<td>54.8%</td>
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</tr>
<tr>
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<td>478</td>
<td>477</td>
<td>572</td>
<td>536</td>
<td>2,544</td>
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</tr>
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<td>University of Massachusetts—Boston</td>
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<td>415</td>
<td>434</td>
<td>444</td>
<td>459</td>
<td>428</td>
<td>2,180</td>
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<tr>
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<td>322</td>
<td>342</td>
<td>436</td>
<td>1,819</td>
<td>232</td>
<td>34.8%</td>
<td>72</td>
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</tr>
<tr>
<td>Post University</td>
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<td>1,068</td>
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<td>212</td>
<td>189</td>
<td>199</td>
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<td>200</td>
<td>983</td>
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</tr>
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<td>180</td>
<td>169</td>
<td>891</td>
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<td>-10.1%</td>
<td>-5</td>
<td>178</td>
<td>-2.9%</td>
</tr>
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<td>180</td>
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<td>704</td>
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</tr>
<tr>
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<td>138</td>
<td>115</td>
<td>154</td>
<td>143</td>
<td>130</td>
<td>680</td>
<td>-8</td>
<td>-5.8%</td>
<td>1</td>
<td>136</td>
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</tr>
<tr>
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<td>660</td>
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<td>-35.4%</td>
<td>-15</td>
<td>132</td>
<td>-11.4%</td>
</tr>
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<tr>
<td>University of Southern Maine</td>
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<td>121</td>
<td>120</td>
<td>105</td>
<td>105</td>
<td>568</td>
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<td>-3.5%</td>
</tr>
<tr>
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<td>112</td>
<td>107</td>
<td>108</td>
<td>106</td>
<td>130</td>
<td>563</td>
<td>18</td>
<td>16.1%</td>
<td>4</td>
<td>113</td>
<td>3.1%</td>
</tr>
<tr>
<td>Suffolk University</td>
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<td>115</td>
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<td>100</td>
<td>546</td>
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<td>-11.5%</td>
<td>-3</td>
<td>109</td>
<td>-3.0%</td>
</tr>
<tr>
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<td>117</td>
<td>114</td>
<td>86</td>
<td>95</td>
<td>529</td>
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<td>-18.8%</td>
<td>-8</td>
<td>106</td>
<td>-7.1%</td>
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<tr>
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<td>155</td>
<td>122</td>
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<td>78</td>
<td>84</td>
<td>526</td>
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<td>-45.8%</td>
<td>-19</td>
<td>105</td>
<td>-17.7%</td>
</tr>
<tr>
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<td>111</td>
<td>92</td>
<td>94</td>
<td>75</td>
<td>481</td>
<td>-34</td>
<td>-31.2%</td>
<td>-9</td>
<td>96</td>
<td>-8.8%</td>
</tr>
<tr>
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<td>475</td>
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<td>-2.2%</td>
<td>-3</td>
<td>95</td>
<td>-2.8%</td>
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<td>87</td>
<td>108</td>
<td>106</td>
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<td>39.5%</td>
<td>7</td>
<td>95</td>
<td>7.4%</td>
</tr>
<tr>
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<td>106</td>
<td>112</td>
<td>90</td>
<td>84</td>
<td>81</td>
<td>473</td>
<td>-25</td>
<td>-23.6%</td>
<td>-8</td>
<td>95</td>
<td>-8.2%</td>
</tr>
<tr>
<td>Saint Michael’s College</td>
<td>VT</td>
<td>95</td>
<td>100</td>
<td>73</td>
<td>82</td>
<td>91</td>
<td>441</td>
<td>-4</td>
<td>-4.2%</td>
<td>-3</td>
<td>88</td>
<td>-2.9%</td>
</tr>
</tbody>
</table>
New England Market: Bachelor’s Business

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Regional Institutions</td>
<td>8,071</td>
<td>8,420</td>
<td>8,004</td>
<td>8,090</td>
<td>8,732</td>
<td>41,317</td>
<td>661</td>
<td>8.2%</td>
<td>99</td>
<td>8263</td>
<td>1.2%</td>
</tr>
<tr>
<td>Median</td>
<td>57</td>
<td>64</td>
<td>53</td>
<td>41</td>
<td>45</td>
<td>202</td>
<td>-12</td>
<td>-21.1%</td>
<td>-5</td>
<td>52</td>
<td>-9.0%</td>
</tr>
<tr>
<td>Mean</td>
<td>95.0</td>
<td>94.6</td>
<td>91.0</td>
<td>88.9</td>
<td>91.9</td>
<td>417.3</td>
<td>-3</td>
<td>-3.2%</td>
<td>-1</td>
<td>92</td>
<td>-1.3%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>85</td>
<td>89</td>
<td>88</td>
<td>91</td>
<td>95</td>
<td>99</td>
<td>10</td>
<td>11.8%</td>
<td>2</td>
<td>90</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

- Regionally, the number of bachelor’s degrees are increasing, compared to a decline in degrees conferred in the national market.
- In addition, the number of institutions entering the business administration market in New England is increasing at a rate faster than the number of degrees conferred and, therefore, this is causing downward pressure on the average institutional conferment for colleges and universities in New England.
- The average (in terms of median and mean) institutional conferment pattern is 52 to 92 degrees per year.
- Based on national incidence levels for bachelor’s degrees in business administration, there could be as many as 750 additional bachelor’s degrees in business administration to be conferred in New England each year.
Like-School Market: Bachelor’s Business

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>572</td>
<td>589</td>
<td>548</td>
<td>529</td>
<td>604</td>
<td>2,842</td>
<td>32</td>
<td>5.6%</td>
<td>0</td>
<td>568</td>
<td>0.1%</td>
</tr>
<tr>
<td>Median</td>
<td>25</td>
<td>21</td>
<td>30</td>
<td>20</td>
<td>24</td>
<td>100</td>
<td>-1</td>
<td>-4.0%</td>
<td>0</td>
<td>24</td>
<td>-1.3%</td>
</tr>
<tr>
<td>Mean</td>
<td>30.1</td>
<td>28.0</td>
<td>28.8</td>
<td>25.2</td>
<td>27.5</td>
<td>123.6</td>
<td>-3</td>
<td>-8.8%</td>
<td>-1</td>
<td>28</td>
<td>-2.9%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>19</td>
<td>21</td>
<td>19</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>3</td>
<td>15.8%</td>
<td>1</td>
<td>20</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

- # of Institutions with a Positive Slope: 11
- # of Institutions with a Negative Slope: 11

- Again, the like-school general market is showing a slight upward trend, and considering all of these schools are similar to Unity in terms of student/institutional demographics, there could be an opportunity for Unity in terms of a new program.
- In terms of conferment, the like-school institutional average (median and mean) is between 24 and 28 degrees per year.
- Comparatively speaking, an average cohort size of 25 students, given the population constraints in the like-school comparison group, is substantial.
# National “Ramp-Up Time”: Bachelor’s Business

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th># Change from 2013</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>4,820</td>
<td>16,404</td>
<td>16,189</td>
<td>37,413</td>
<td>11,369</td>
<td>235.9%</td>
<td>5685</td>
<td>12471</td>
<td>45.6%</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>19</td>
<td>1</td>
<td>10.0%</td>
<td>1</td>
<td>10</td>
<td>4.8%</td>
</tr>
<tr>
<td>Mean</td>
<td>42.3</td>
<td>101.9</td>
<td>81.4</td>
<td>168.5</td>
<td>39</td>
<td>92.4%</td>
<td>20</td>
<td>75</td>
<td>26.0%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>114</td>
<td>161</td>
<td>199</td>
<td>222</td>
<td>85</td>
<td>74.6%</td>
<td>43</td>
<td>158</td>
<td>26.9%</td>
</tr>
<tr>
<td># of Institutions with a Positive Slope</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
<td>81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging 10–75 degrees conferred per year (three-year average of the median and mean).
- Nationally, the average program size is 38–90 degrees conferred per year (slide 86). Of the 222 new programs that entered the business administration space, 56 averaged 38 degrees conferred per year (25%) by 2015 and 36 had averaged 90 degrees per year (16%) by 2015.
  - For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (38–90 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems very obtainable within the first three years that the program is offered based on the success of other new programs.
# National Market: Bachelor’s Tourism

## Five-Year Total

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>654</td>
<td>622</td>
<td>594</td>
<td>580</td>
<td>611</td>
<td>3,061</td>
<td>-43</td>
<td>-6.6%</td>
<td>-13</td>
<td>612</td>
<td>-2.1%</td>
</tr>
<tr>
<td>Median</td>
<td>25</td>
<td>21</td>
<td>13</td>
<td>25</td>
<td>20</td>
<td>65</td>
<td>-6</td>
<td>-22.0%</td>
<td>-1</td>
<td>21</td>
<td>-3.4%</td>
</tr>
<tr>
<td>Mean</td>
<td>34.4</td>
<td>34.6</td>
<td>28.3</td>
<td>34.1</td>
<td>33.9</td>
<td>113.4</td>
<td>0</td>
<td>-1.4%</td>
<td>0</td>
<td>33</td>
<td>-0.4%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>19</td>
<td>18</td>
<td>21</td>
<td>17</td>
<td>18</td>
<td>27</td>
<td>-1</td>
<td>-5.3%</td>
<td>0</td>
<td>19</td>
<td>-1.6%</td>
</tr>
</tbody>
</table>

- # of Institutions with a Positive Slope: 8
- # of Institutions with a Negative Slope: 14

- Total number of tourism bachelor’s degrees conferred in the US is decreasing slightly—nearly 7% decrease in 2015 versus 2011 (represents 13 fewer degrees annually on average).
- The number of institutions offering a tourism degree is decreasing. Coupled with the average conferral by institution trending downward, nationally, the market may be fully absorbed, and institutional growth can only result in further fragmentation of the market versus increased student demand.
- Due to the relationship between overall market decline and the number of institutions leaving the market at a rate less than the growth in degrees conferred, the average (in terms of median and mean) institutional-conferment pattern has been decreasing and is currently at 21 to 33 degrees per year.
- Similar to the conferment trend in general, nearly two-thirds of institutions are experiencing a decrease in their average annual number of degrees conferred.
Regionally, the number of bachelor’s degrees are increasing at a pretty healthy rate.

In addition, the number of institutions entering the New England tourism market is increasing at a rate less than the number of degrees conferred and, therefore, this is causing an increase in the average institutional conferment for colleges and universities in New England.

The average (in terms of median and mean) institutional conferment pattern is five to six degrees per year.

Based on national incidence levels for bachelor’s degrees in tourism, there could be as many as 25 additional bachelor’s degrees in tourism to be conferred in New England each year.
National “Ramp-Up Time”: Bachelor’s Tourism

<table>
<thead>
<tr>
<th>Institution Name</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Three-Year Total</th>
<th># Change from 2013</th>
<th>% Change from 2013</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>153</td>
<td>113</td>
<td>96</td>
<td>362</td>
<td>-57</td>
<td>-37.3%</td>
<td>-29</td>
<td>121</td>
<td>-23.6%</td>
</tr>
<tr>
<td>Median</td>
<td>11</td>
<td>10</td>
<td>6</td>
<td>22</td>
<td>-5</td>
<td>-42.9%</td>
<td>-2</td>
<td>9</td>
<td>-26.0%</td>
</tr>
<tr>
<td>Mean</td>
<td>25.5</td>
<td>28.3</td>
<td>19.2</td>
<td>51.7</td>
<td>-6</td>
<td>-24.7%</td>
<td>-3</td>
<td>24</td>
<td>-13.0%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>-1</td>
<td>-16.7%</td>
<td>-1</td>
<td>5</td>
<td>-10.0%</td>
</tr>
</tbody>
</table>

- After restricting the market to those programs that had not conferred a degree prior to 2013, you can see that new programs are averaging 9–24 degrees conferred per year (three-year average of the median and mean).
- New entrants to the market are struggling to maintain (much less grow) their enrollment.
- Nationally, the average program size is 21–33 degrees conferred per year (slide 91). Of the seven new programs that entered the tourism space, two averaged 21 degrees conferred per year (29%) by 2015 and one had averaged 33 degrees per year (14%) by 2015.
  - For a “critical mass” at Unity the program needs to enroll around 20 students per year (assuming average institutional retention/graduation) and graduate around 12–14 students per cohort. Stamats rarely suggests that any new program to the market would achieve success greater than the average conferment of all programs nationally (21–33 degrees/year). Given the pattern of new programs to the market, average enrollment nationally seems difficult within the first three years that the program is offered based on the success of other new programs and the overall downward trend.
Business Management and Operations Classifications Bachelor’s

- Despite a relatively focused emphasis within business management and operations, identifying the likely job titles and responsibilities for someone seeking a bachelor’s in business management and operations is difficult, especially someone focused on sustainable business or ecotourism.

- Therefore, at this level of the review Stamats chose to focus at the macro level regarding job-postings data for business administration and management (Business Administration and Management [52.0201]).

- This approach was used to illustrate the current market and job trends for business administration and management. In an effort to identify discipline-specific skills and employers, a more detailed review of opportunities was provided for business administration and management.
### Business Management and Operations Bachelor’s Job Counts

<table>
<thead>
<tr>
<th>Job Title/Family</th>
<th>Region</th>
<th>2012</th>
<th>2016</th>
<th>Five-Year Total</th>
<th>Number Change from 2012</th>
<th>Percent Change from 2012</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Management and Operations</td>
<td>New England</td>
<td>20,861</td>
<td>34,623</td>
<td>149,224</td>
<td>13,762</td>
<td>65.97%</td>
<td>3778.3</td>
<td>29,845</td>
<td>12.66%</td>
</tr>
<tr>
<td>Business Management and Operations</td>
<td>Nation</td>
<td>350,455</td>
<td>564,783</td>
<td>2,411,293</td>
<td>214,328</td>
<td>61.16%</td>
<td>63439.6</td>
<td>482,259</td>
<td>13.15%</td>
</tr>
</tbody>
</table>

- The New England area is defined as all job postings in CT, ME, MA, NH, RI, and VT.
- The numbers above represent all the web postings that require at least a bachelor’s degree upon entry.
- As demonstrated above, the number of local (New England) job postings for business-management positions is increasing at a rate slower than the national average.
- Considering the regional focus of Unity in terms of prospective undergraduate students and the number of BBA programs regionally (previous slides), this could be a point of caution for a new program in business administration and management, even one devoted specifically to sustainable business and/or ecotourism.
Of the 100,685 job postings in 2016 for business administration and management, nearly two-thirds (63%) were tied to a specific employer or type of industry. A total of 200 different segments were indicated. The largest segments are presented above.

Considering the breadth of institutional types (public/private, for-profit/not-for-profit), as well as BBA options and/or concentrations within each program, it is not surprising that the number and types of industries seeking business undergraduates are broad.

Specific mentions towards ecology, tourism, and sustainability included less than 2% of all industry types.
### Business Administration and Management Bachelor’s Skills

The top skills for business administration and management in the New England region

<table>
<thead>
<tr>
<th>Skill</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Excel</td>
<td>30%</td>
</tr>
<tr>
<td>Budgeting</td>
<td>26%</td>
</tr>
<tr>
<td>Project Management</td>
<td>23%</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>21%</td>
</tr>
<tr>
<td>Microsoft Powerpoint</td>
<td>15%</td>
</tr>
<tr>
<td>Scheduling</td>
<td>14%</td>
</tr>
<tr>
<td>Customer Service</td>
<td>14%</td>
</tr>
<tr>
<td>Sales</td>
<td>14%</td>
</tr>
<tr>
<td>Supervisory Skills</td>
<td>13%</td>
</tr>
<tr>
<td>Accounting</td>
<td>12%</td>
</tr>
<tr>
<td>Staff Management</td>
<td>10%</td>
</tr>
</tbody>
</table>

- Most (97%) of the job postings in 2016 for business administration and management listed specific skills necessary (or preferred) for the positions. A total of 200 unique skills were indicated. The most popular skill sets are presented above.
- With the exception of accounting, many of the skills needed for bachelor’s-level business administration and management jobs in the New England area are more “general business” (Microsoft Excel, budgeting, supervision, management, software, and scheduling) than “technical.”
### Business Management and Operations Bachelor’s Job Market Summary

<table>
<thead>
<tr>
<th>SOC Code</th>
<th>Occupational Title</th>
<th>BLS/OES 2015 Nationwide</th>
<th>Salary Nationwide</th>
<th>Education Nationwide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number Employed in 2015</td>
<td>Projected Change Over 10 Years</td>
<td>Burning Glass Mean Salary</td>
<td>2015 BLS/OES Mean Salary</td>
</tr>
<tr>
<td>11-9199</td>
<td>Managers, All Other</td>
<td>376,440</td>
<td>3.9%</td>
<td>$86,582</td>
</tr>
<tr>
<td>11-1021</td>
<td>General and Operations Managers</td>
<td>2,145,140</td>
<td>7.1%</td>
<td>$100,610</td>
</tr>
<tr>
<td>11-3051</td>
<td>Industrial Production Managers</td>
<td>169,390</td>
<td>-3.7%</td>
<td>$100,144</td>
</tr>
<tr>
<td>11-3061</td>
<td>Purchasing Managers</td>
<td>72,600</td>
<td>1%</td>
<td>$99,454</td>
</tr>
<tr>
<td>11-3011</td>
<td>Administrative Services Managers</td>
<td>270,080</td>
<td>8.2%</td>
<td>$71,756</td>
</tr>
</tbody>
</table>

- The Burning Glass occupational codes for business management and operations incorporate 33 BLS/OES occupation codes. The occupation codes Stamats felt were most related to the Unity program are presented above.
- Using BLS data to estimate the total market (number employed in 2015), as well as the percentage of employees currently at a bachelor’s degree or higher, provides context as to the unmet demand in the current labor force, i.e., retooling. If the proportion of people with a bachelor’s degree or higher was significantly lower than the proportion of jobs requiring a bachelor’s degree, you could expect a decent share of students currently employed in the field being a market for your program. In these data, a large proportion (sometimes half or more) of current employees would not be qualified based on education alone for the current job postings.
Possible Bachelor’s Business Competitors – 1

- Because of the unique nature of a sustainable business enterprise program within the tourism and business administration and management umbrella, Stamats primarily relied on Google/web searches to identify competitors. The following search terms were used:
  - Sustainable business bachelor’s
  - Ecotourism degree programs
  - Sustainable business enterprise bachelor’s degree
  - Bachelor’s sustainable management
  - Outdoor hospitality degrees

- Taking the approach of a prospective student, Stamats did not go beyond the first five pages of a search result when looking for prospective programs.

- A couple of notes about the results: Many of the programs were included in multiple search results and were not recorded multiple times. Only programs that offered a bachelor’s program in sustainable business or sustainable tourism/hospitality management were included in the results, and the program had to be located in the United States to be included.
  - Stamats found a variety of minor options, certificate options, and programs located outside the United States (mainly Australia and Canada).

- A full listing of results are included on the next page.
Possible Bachelor’s Business Competitors – 2

A total of 23 programs were identified. The six in red were profiled based on the similarity of the program to the proposed program at Unity or being similar in terms of Unity in school type:

- **Aquinas College**
- **Arizona State University**
- **Ashford University**
- **Bellevue University**
- **California State University Monterey Bay**
- **Cascadia College**
- **George Mason University**
- **Hamline University**
- **Indiana University Purdue University Indianapolis**
- **Kansas State University**
- **Liberty University**
- **New York University Stern**
- **Oregon State University**
- **Southern Utah University**
- **St. Petersburg College**

- **University of Colorado—Denver**
- **University of Louisville**
- **University of North Carolina**
- **University of Phoenix**
- **University of Southern Maine**
- **University of Vermont**
- **University of Wisconsin**
Aquinas College

- Offers a bachelor’s in sustainable business as well as a minor
- Program mission statement: “To prepare innovative change agents who will harness the power of business and the natural environment to foster financial prosperity, ecosystem resilience, and human flourishing.”
- “Sustainable Business is interdisciplinary in nature, integrating science, business, and environmental studies.”
- Tuition (full time): $498/credit hour
- Curriculum consists of 65 credits beyond the program core consisting of primarily general business, economics, environmental studies, and sustainable business.
- Looking at their 2011–2015 IPEDS-conferment data, business programs (hard to isolate just the sustainability) are essentially flat.
Arizona State University

- Offers a bachelor’s in sustainability from the W.P. Carey School of Business
- The program is offered online as well as face to face at the Tempe and West campus locations.
- “The skills and knowledge necessary to influence growth, improve returns on capital, and improve risk management through sustainability.”
- Lists sustainable business degree outcomes (including median salary data) on the program landing page. Job titles include all the standard business outcomes, including green occupations.
- Tuition (full time): $345/credit hour in state versus $882 out of state. Online tuition ranges from $490 to $633/credit hour.
- Coursework includes business courses and courses from the School of Sustainability.
CSU Monterey Bay

- Offers a bachelor’s in sustainable hospitality management from the College of Business with two concentrations:
  1. Sustainable Hotel, Resort, and Event Management
  2. Sustainable Ecotourism Management
- “The central core of the program focuses on the concept of sustainability plus, going beyond sustainability to address issues in terms of the five-dimensioned lens of people, ethics, equity, planet and profit. Students can focus in sustainable hotel, resort and event management or sustainable ecotourism management.”
- Tuition (full time): $207/credit hour in state versus $580 out of state
- Curriculum consists of business, sustainability studies, and hospitality management coursework.
Kansas State University

- Offers a bachelor’s in wildlife and outdoor enterprise management in the Department of Horticulture
- “Degree to be created to train professional operational managers for hunting/shooting preserves and resorts, gamebird production companies, fishing resorts and outdoor experience companies (i.e., trail riding, nature study, bird watching, back country hiking/camping, etc.).”
- Tuition (full time): $300/credit hour in state versus $797 out of state
- The major degree plan consists of business and hospitality management coursework but primarily focuses on the natural resources management (housed in the College of Agriculture) portion of the curriculum.
- Their programmatic enrollment data (via factbook) show an entering (new freshman) and conferment (graduation) of around 20 students per year.
University of Southern Maine

- Offers a bachelor’s in business administration with sustainable business track
- In addition to the concentration, students are encouraged to minor in or receive a certificate related to sustainability, applied energy, or nature tourism.
- “Students completing this track will be better prepared to identify green market opportunities and to manage—both traditional firms and social enterprises—for the triple bottom line of environmental, social, and financial performance.”
- Tuition (full time): $253/credit hour in state versus $665 out of state
- Curriculum consists of business administration core plus 15 credits as described to the right.
- Looking at their 2011–2015 IPEDS-conferment data, business programs (hard to isolate just the sustainability) are essentially flat.
University of Wisconsin

- Offers a bachelor’s in sustainable management online
- Program is geared toward transfer students. To be admitted you need 60 college/university credits.
- The program is offered by the University of Wisconsin Extension System, and students apply to one of the four UW regional campuses for graduation and financial aid requirements.
- Tuition (full time): $390/credit hour (regardless of residency)
- An interdisciplinary curriculum covers topics including systems thinking, triple-bottom-line accounting, the economics of sustainability, natural resource management, environmental science and policy, and information systems.
- Enrollment data are captured at the institutional level (depending on the school they apply to for admission) and are impossible to isolate.
Competitor Summary for Bachelor’s in Business

- **Concentrations/Specializations:** Similar to the intended program for Unity, all of the programs took a management aspect regarding their program. Most of the programs were heavily focused on business management and sustainability. Monterey Bay and Southern Maine offered specialization concentrations in areas either directly related to tourism management or ecotourism. Kansas State University focused on sustainability via natural resource management. Clearly the market for a specialized program in business towards sustainability exists; it is just not universally defined at this point.

- **Student-Credit Hours:** Nothing suggests anything beyond the traditional four-year undergraduate experience. In fact, most offer degree plans/requirements suggesting four years of study. That being said, the University of Wisconsin Extension System program required 60 credits (two years of study) for admission, but still suggested it would take four semesters (assuming full-time attendance) to complete after entry. None of the programs offered an accelerated option.

- **Cost per Credit Hour:** All of the programs listed (or were converted) at a per-credit-hour basis. The most inexpensive tuition per credit is University of Southern Maine at $253 per credit, and the most expensive is Arizona State (out of state) at $883. Most of the programs were in the $400–$600 price range with both Arizona State and University of Wisconsin not imposing out-of-state charges for the online program. This is an important point since students could attend a local community college and earn their associate’s degree and then transfer into either online program, not have to uproot their lives for the program, and pay a noticeably lower cost than other options.
Bachelor’s in Sustainable Business Implications

- **Student Demand**: The student demand question is mixed. From a scale perspective, a BBA program is the most favorable of all the programs under consideration in terms of both total market and average conferment. That being said, the institutional average conferment patterns (median and mean) are in decline pretty much across the board. The one bright spot has been new programs entering the market as new programs are performing quite well. Looking at the tourism angle, the trends are slightly more favorable, but obviously the scale is significantly smaller.

- **Employment**: Despite a relatively focused program targeted towards sustainable enterprise, much of the program would provide a solid foundation for employment in a variety of sectors, both directly and indirectly tied to business. Specific jobs towards sustainability would need to be examined in more detail to define the necessary skills and industries to target for this program.

- **Competition**: After spending a couple of hours looking for programs via web searches, it is clear that there are relatively few competitors, however, the competitive landscape is across the board. This is not uncommon in a new program to the market (higher education) nationwide. It is still too early to gauge success for many of these programs, especially programs that are housed under another larger program (programs that are offered as a concentration or track, much like MBAs).

- **Overall**: Given the institutional mission of Unity College, sustainable business enterprise seems like a natural opportunity in terms of mission fit. After a brief examination, with the exception of Kansas State, most of these programs are grounded in a firm business program. This is obviously lacking from the current Unity program portfolio.
Final Phase:
The Final Two
The Final Two Methodology

- Following the phone call with President Khoury and Dr. John Zavodny on April 7, 2017, the final two programs to be examined in more detail include (with corresponding CIP code or codes):
  - Biological and Biomedical Sciences – (26.XXXX)
    - A more focused review of all flavors of biology in terms of cohort size and trends at the national level
  - Business Administration and Management – (52.0201)
    - With a special attention towards sustainable business enterprise

- Unfortunately the intermediary phase two did not provide the results that Unity College was hoping for in terms of opportunity and cohort size. Therefore, Stamats is going to review the biology opportunity in a little more detail, including areas outside of the initial look at 26.9999, and include findings from the Current Program Demand Assessment related to biology that was completed in February 2017.

- This final look will include degree-conferment trends related to biology and a more in-depth review of sustainable business enterprise competitors, nomenclature, and job-postings data.
Biology
Variations of Biology

As mentioned throughout the report, Stamats primarily relies on CIP codes or group of codes to define the market and market potential. Given the number of CIP codes available at the six-digit biology undergraduate level (n=64), a determination was made to concentrate on the biology programs that offered the largest potential nationally and, therefore, only biology programs that conferred on average 200 degrees per year were considered. These 26 CIP codes account for nearly 98% of all biology-related degrees conferred.

Based on program descriptions (see following slides), Unity’s mission, and Stamats’ knowledge about the biology field as a whole, Stamats felt CIP codes highlighted in green deserved an additional examination.
Biology CIP Program Descriptions – 1

- CIP code 26.0101 (Biology/Biological Sciences, General)
  - A general program of biology at the introductory, basic level or a program in biology or the biological sciences that is undifferentiated as to title or content. Includes instruction in general biology and programs covering a variety of biological specializations.

- CIP code 26.0204 (Molecular Biology)
  - A program that focuses on the scientific study of the structure and function of biological macromolecules and the role of molecular constituents and mechanisms in supramolecular assemblies and cells. Includes instruction in such topics as molecular signaling and transduction, regulation of cell growth, enzyme substrates and mechanisms of enzyme action, DNA-protein interaction, and applications to fields such as biotechnology, genetics, cell biology, and physiology.

- CIP code 26.0210 (Biochemistry and Molecular Biology)
  - A program of study that combines the biological sub-disciplines of biochemistry and molecular biology. Includes instruction in general biology, general and organic chemistry, physics, biochemistry, molecular biology, immunology, microbiology, genetics, and cellular biology.
Biology CIP Program Descriptions – 2

- **CIP code 26.0301 (Botany/Plant Biology)**
  - A program that focuses on the scientific study of plants, related microbial organisms, and plant habitats and ecosystem relations. Includes instruction in plant anatomy and structure, phytochemistry, cytology, plant genetics, plant morphology and physiology, plant ecology, plant taxonomy and systematics, paleobotany, and applications of biophysics and molecular biology.

- **CIP code 26.0406 (Cell/Cellular and Molecular Biology)**
  - An integrated, combined program that focuses on the scientific study of cells, cellular systems, and the molecular basis of cell structure and function. Includes instruction in cell biology, cell chemistry, molecular biology, biophysics, and structural biology.

- **CIP code 26.0502 (Microbiology, General)**
  - A program that focuses on the scientific study of unicellular organisms and colonies, and subcellular genetic matter and their ecological interactions with human beings and other life. Includes instruction in microbial genetics, cell biology, cell physiology, virology, pathogenic microbiology, environmental microbiology, immunology, biostatistics, bioinformatics, and laboratory methods including microscopy.
Biology CIP Program Descriptions – 3

- **CIP code 26.0701 (Zoology/Animal Biology)**
  - A general program that focuses on the scientific study of the biology of animal species and phyla, with reference to their molecular and cellular systems, anatomy, physiology, and behavior. Includes instruction in molecular and cell biology, microbiology, anatomy and physiology, ecology and behavior, evolutionary biology, and applications to specific species and phyla.

- **CIP code 26.1501 (Neuroscience)**
  - A program that focuses on the interdisciplinary scientific study of the molecular, structural, physiologic, cognitive, and behavioral aspects of the brain and nervous system. Includes instruction in molecular and cellular neuroscience, brain science, anatomy and physiology of the central nervous system, molecular and biochemical bases of information processing, behavioral neuroscience, biology of neuropsychiatric disorders, and applications to the clinical sciences and biomedical engineering.
### National Market: Bachelor’s 26.0101

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>62,785</td>
<td>66,261</td>
<td>69,210</td>
<td>72,167</td>
<td>74,441</td>
<td>344,864</td>
<td>11,656</td>
<td>18.6%</td>
<td>2922</td>
<td>68973</td>
<td>4.2%</td>
</tr>
<tr>
<td>Median</td>
<td>25</td>
<td>27</td>
<td>28</td>
<td>28</td>
<td>30</td>
<td>130</td>
<td>5</td>
<td>18.0%</td>
<td>1</td>
<td>28</td>
<td>3.6%</td>
</tr>
<tr>
<td>Mean</td>
<td>48.7</td>
<td>51.1</td>
<td>52.0</td>
<td>53.9</td>
<td>55.5</td>
<td>251.7</td>
<td>7</td>
<td>14.0%</td>
<td>2</td>
<td>52</td>
<td>3.1%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>1,290</td>
<td>1,297</td>
<td>1,332</td>
<td>1,339</td>
<td>1,342</td>
<td>1,370</td>
<td>52</td>
<td>4.0%</td>
<td>15</td>
<td>1320</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

- Total number of biology bachelor’s degrees conferred in the US is increasing—nearly 20% increase in 2015 versus 2011 (represents 2,922 additional degrees annually on average).
- The number of institutions offering a bachelor’s degree in biology is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a biology degree is not entirely responsible for the demonstrated increase in degrees conferred (suggest increased student demand is driving most of the growth).
- Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 28 to 52 degrees per year.
- Similar to the conferment trend in general, nearly two-thirds of institutions are experiencing an increase in their average annual number of degrees conferred.
- In New England there could be as many as 500 additional degrees conferred each year based on the incidence of degrees conferred nationally.
National Market: Bachelor’s 26.0204

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>693</td>
<td>711</td>
<td>764</td>
<td>806</td>
<td>850</td>
<td>3,824</td>
<td>157</td>
<td>22.7%</td>
<td>41</td>
<td>765</td>
<td>5.3%</td>
</tr>
<tr>
<td>Median</td>
<td>8</td>
<td>10</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>28</td>
<td>3</td>
<td>37.5%</td>
<td>1</td>
<td>9</td>
<td>5.3%</td>
</tr>
<tr>
<td>Mean</td>
<td>13.1</td>
<td>14.5</td>
<td>13.6</td>
<td>15.2</td>
<td>16.7</td>
<td>60.7</td>
<td>4</td>
<td>27.5%</td>
<td>1</td>
<td>15</td>
<td>5.4%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>53</td>
<td>49</td>
<td>56</td>
<td>53</td>
<td>51</td>
<td>63</td>
<td>-2</td>
<td>-3.8%</td>
<td>0</td>
<td>52</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

- Total number of molecular biology bachelor’s degrees conferred in the US increased nearly 23% in 2015 versus 2011 (represents 41 additional degrees annually on average).
- The number of institutions offering a molecular biology degree is flat or decreasing slightly.
- Due to the relationship between overall market growth and the number of institutions leaving the market, the average (in terms of median and mean) institutional conferment pattern has been increasing (at a rate consistent with the overall market as a whole) and is currently at 9 to 15 degrees per year.
- Similar to the conferment trend in general, over 60% of institutions are experiencing an increase in their average annual number of degrees conferred.
- Despite the favorable market trends, regionally and amongst like schools, molecular biology is probably being over conferred compared to the national distribution of bachelor’s degrees conferred.
### National Market: Bachelor’s 26.0210

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>585</td>
<td>712</td>
<td>726</td>
<td>826</td>
<td>788</td>
<td>3,637</td>
<td>203</td>
<td>34.7%</td>
<td>52</td>
<td>727</td>
<td>7.1%</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>41</td>
<td>-3</td>
<td>-25.0%</td>
<td>-1</td>
<td>11</td>
<td>-7.5%</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>18.3</td>
<td>18.7</td>
<td>17.3</td>
<td>18.8</td>
<td>17.5</td>
<td>74.2</td>
<td>-1</td>
<td>-4.2%</td>
<td>0</td>
<td>18</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>32</td>
<td>38</td>
<td>42</td>
<td>44</td>
<td>45</td>
<td>49</td>
<td>13</td>
<td>40.6%</td>
<td>3</td>
<td>40</td>
<td>8.0%</td>
</tr>
<tr>
<td># of Institutions with a Positive Slope</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Institutions with a Negative Slope</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Total number of biochemistry bachelor’s degrees conferred in the US is increasing—nearly 35% increase in 2015 versus 2011 (represents 52 additional degrees annually on average).
- The number of institutions offering a biochemistry degree is increasing faster than the growth in the number of degrees.
- Due to the relationship between overall market growth (slower than the number of institutions) and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been decreasing and is currently at 11 to 18 degrees per year.
- Despite the mixed degree-conferment trend in general, nearly 70% of institutions are experiencing an increase in their average annual number of degrees conferred.
- In New England there could be as many as 40 extra degrees conferred (surplus) each year based on the incidence of degrees conferred nationally.
### National Market: Bachelor’s 26.0301

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>225</td>
<td>196</td>
<td>200</td>
<td>224</td>
<td>212</td>
<td>1,057</td>
<td>-13</td>
<td>-5.8%</td>
<td>0</td>
<td>211</td>
<td>0.1%</td>
</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>16</td>
<td>1</td>
<td>25.0%</td>
<td>0</td>
<td>5</td>
<td>6.5%</td>
</tr>
<tr>
<td>Mean</td>
<td>6.6</td>
<td>6.1</td>
<td>6.9</td>
<td>7.0</td>
<td>7.1</td>
<td>25.2</td>
<td>0</td>
<td>6.8%</td>
<td>0</td>
<td>7</td>
<td>2.6%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>34</td>
<td>32</td>
<td>29</td>
<td>32</td>
<td>30</td>
<td>42</td>
<td>-4</td>
<td>-11.8%</td>
<td>-1</td>
<td>31</td>
<td>-2.5%</td>
</tr>
</tbody>
</table>

- Total number of botany bachelor’s degrees conferred in the US is essentially flat, but volatile.
- Due to the relationship between overall market growth (or lack thereof) and the number of institutions leaving the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at five to seven degrees per year.
- Similar to the conferment trend in general, nearly 60% of institutions are experiencing a decrease in their average annual number of degrees conferred.
- Despite less-than-favorable trends, the local region (as well as the like-school market) incidence suggests that a few more degrees (one or two) could be awarded each year.
**National Market: Bachelor’s 26.0406**

<table>
<thead>
<tr>
<th>Total: All Institutions</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,062</td>
<td>2,127</td>
<td>2,377</td>
<td>2,471</td>
<td>2,627</td>
<td>11,664</td>
<td>565</td>
<td>27.4%</td>
<td>147</td>
<td>2333</td>
<td>6.3%</td>
</tr>
<tr>
<td>Median</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>23</td>
<td>19</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>34</td>
<td>-8</td>
<td>-34.8%</td>
<td>-2</td>
<td>17</td>
<td>-12.4%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>25</td>
<td>28</td>
<td>39</td>
<td>41</td>
<td>44</td>
<td>47</td>
<td>19</td>
<td>76.0%</td>
<td>5</td>
<td>35</td>
<td>14.4%</td>
</tr>
</tbody>
</table>

- Total number of molecular biology bachelor’s degrees conferred in the US is increasing—27% increase in 2015 versus 2011 (represents 147 additional degrees annually on average).
- The number of institutions offering a molecular biology degree is increasing fairly rapidly.
- Due to the relationship between overall market growth (growing at a rate slower than the number of institutions) and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been decreasing fairly rapidly and is currently at 17 to 68 degrees per year.
- Similar to the conferment trend in general, nearly 75% of institutions are experiencing an increase in their average annual number of degrees conferred.
- In New England there could be as many as 55 extra degrees conferred (surplus) each year based on the incidence of degrees conferred nationally.
### National Market: Bachelor’s 26.0502

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total: All Institutions</td>
<td>1,731</td>
<td>1,708</td>
<td>1,963</td>
<td>1,992</td>
<td>2,169</td>
<td>9,563</td>
<td>438</td>
<td>25.3%</td>
<td>116</td>
<td>1913</td>
<td>6.1%</td>
</tr>
<tr>
<td>Median</td>
<td>19</td>
<td>19</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>95</td>
<td>1</td>
<td>5.3%</td>
<td>0</td>
<td>19</td>
<td>1.0%</td>
</tr>
<tr>
<td>Mean</td>
<td>25.1</td>
<td>25.1</td>
<td>26.2</td>
<td>25.2</td>
<td>27.5</td>
<td>115.2</td>
<td>2</td>
<td>9.4%</td>
<td>0</td>
<td>26</td>
<td>1.9%</td>
</tr>
<tr>
<td>Institutions Conferring 1+ Degrees</td>
<td>69</td>
<td>68</td>
<td>75</td>
<td>79</td>
<td>79</td>
<td>83</td>
<td>10</td>
<td>14.5%</td>
<td>3</td>
<td>74</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

- **Total number of microbiology bachelor’s degrees conferred in the US is increasing—25% increase in 2015 versus 2011 (represents 116 additional degrees annually on average).**
- **The number of institutions offering a bachelor’s degree in microbiology is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a microbiology degree is not entirely responsible for the demonstrated increase in degrees conferred (suggesting increased student demand is driving most of the growth).**
- **Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 19 to 26 degrees per year.**
- **Similar to the conferment trend in general, nearly 56% of institutions are experiencing an increase in their average annual number of degrees conferred.**
- **Despite modest trends, the local region (as well as the like-school market) incidence suggests that as many as 40 degrees could be awarded each year.**
Total number of zoology/animal biology bachelor’s degrees conferred in the US is decreasing slightly—nearly 4% decrease in 2015 versus 2011 (represents 11 fewer degrees annually on average).

The number of institutions offering a zoology/animal biology degree is decreasing slightly.

Due to the relationship between overall market decline (at a rate less than the number of institutions) and the number of institutions leaving the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 28 to 38 degrees per year.

Similar to the mixed conferment trend in general, nearly 55% of institutions are experiencing an increase in their average annual number of degrees conferred.

Based on the national incidence, the zoology/animal biology market could be fully absorbed locally (actually operating at a slight surplus). The like-school market would suggest a small opportunity might exist.
### National Market: Bachelor’s 26.1501

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Five-Year Total</th>
<th># Change from 2011</th>
<th>% Change from 2011</th>
<th>Slope</th>
<th>Mean</th>
<th>Slope/ Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total: All Institutions</strong></td>
<td>2,793</td>
<td>3,223</td>
<td>3,727</td>
<td>4,242</td>
<td>5,004</td>
<td>18,989</td>
<td>2,211</td>
<td>79.2%</td>
<td>544</td>
<td>3798</td>
<td>14.3%</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>20</td>
<td>21</td>
<td>80</td>
<td>5</td>
<td>31.3%</td>
<td>1</td>
<td>19</td>
<td>6.3%</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>25.4</td>
<td>27.8</td>
<td>30.8</td>
<td>31.0</td>
<td>35.5</td>
<td>128.3</td>
<td>10</td>
<td>39.8%</td>
<td>2</td>
<td>30</td>
<td>7.8%</td>
</tr>
<tr>
<td><strong>Institutions Conferring 1+ Degrees</strong></td>
<td>110</td>
<td>116</td>
<td>121</td>
<td>137</td>
<td>141</td>
<td>148</td>
<td>31</td>
<td>28.2%</td>
<td>8</td>
<td>125</td>
<td>6.6%</td>
</tr>
<tr>
<td><strong># of Institutions with a Positive Slope</strong></td>
<td>107</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong># of Institutions with a Negative Slope</strong></td>
<td>22</td>
<td></td>
<td></td>
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</tbody>
</table>

- Total number of neuroscience bachelor’s degrees conferred in the US is increasing strongly—nearly 80% increase in 2015 versus 2011 (represents 544 additional degrees annually on average).
- The number of institutions offering a bachelor’s degree in neuroscience is increasing, albeit at a rate noticeably slower than the number of degrees conferred. This means the expansion in the number of institutions offering a neuroscience degree is not entirely responsible for the demonstrated increase in degrees conferred (suggesting increased student demand is driving most of the growth).
- Due to the relationship between overall market growth and the number of institutions entering the market, the average (in terms of median and mean) institutional conferment pattern has been increasing and is currently at 19 to 30 degrees per year.
- Similar to the conferment trend in general, nearly 85% of institutions are experiencing an increase in their average annual number of degrees conferred.
- Despite positive trends nationally, regionally (and in the like-school market) there may be as many as 400 extra degrees conferred (surplus) based on the national incidence of neuroscience degrees conferred.
The above graphic illustrates the summary of the eight biology-related CIP codes explored in more detail by the request of Unity College. More explanation is provided on the following slide.
Biology Variations Summary – 2

- Despite all but botany providing the opportunity for Unity to achieve the critical mass as described earlier (14 conferrals per year), many of the programs have points of caution in terms of programmatic offering for Unity.
  - Negative trends in terms of degree growth (Botany and Zoology)
  - Average institutional conferment patterns trending downward (biochemistry and cellular biology)
- Initially programs that had higher incidence levels in the like-school market than regionally (New England) were considered in phase one of the research. Using that same metric, only biology, molecular biology, and neuroscience own that distinction.
- In addition, each of the disciplines are showing an increase in the number of degrees conferred faster than the number of institutions entering the market nationally (red line above the black line).
- Despite favorable trends for all three, Stamats feels that general biology (26.0101) offers the best opportunity for Unity based on scale (one of the largest bachelor’s programs nationwide), growth, and cohort size. Neuroscience is also showing similar trends, but the program seems too specialized for Unity to enter the market quickly.
General Biology

- As illustrated in previous slides, and confirmed in the Current Program Demand Report delivered in February 2017, biology is an opportunity for growth for Unity, specifically a more generalized approach to biology (CIP code 26.0101).
- As demonstrated in the Current Program Demand Assessment, Unity’s current varieties of Biology are missing out on a rather large segment of the total biology landscape and, furthermore, people are seeking out Unity (Google Analytics) for biology but are being turned away by the current program offerings.
- Some of the highlights from the Current Demand Assessment are highlighted on the following slides to further reiterate the need for a more generalized approach to biology on the Unity College campus.
The data show that, while biology exhibits high levels of current demand, there is an even greater potential for increased growth in the coming years.

Furthermore, it is important to note that the factors that contribute to biology’s high overall demand score are largely factors related to the higher education and labor market as a whole and not related to demand for the biology program at Unity specifically.

The factors and data points listed below are those that contribute to biology’s high-demand ranking:

- **Scale of Degree Conferment (National):** A typical cohort in biology programs among all institution types is 30 students, which is the second-highest median cohort among all programs.

- **Scale of Degree Conferment (AASHE):** Similarly, typical cohorts in biology programs among AASHE member colleges is 32 students per year, which is the largest median cohort among all programs.

- **Trend in Applications:** Similarly, applications grew from 16 in 2012 to 55 in 2016; however, it should be noted that while applications increased alongside inquiries, biology’s inquiry-to-application conversion ratio was the lowest among all programs, which suggests that inquiring students are not interested in the particular orientation/focus of Unity’s biology program.

- **Google Analytics Bounce Rate:** The average bounce rate for visits to the biology web page was 48%, which was the lowest among all programs (average = 55%); this indicates that visitors to the program’s web page are engaged long enough to want to learn about the program.
The factors and data points listed below are those that contribute to biology’s high-demand ranking continued:

- **Scale of Job Postings (National):** Between 2010 and 2016, there were, on average, 35,676 jobs posted annually for professionals in the biology field with a bachelor’s degree; this figure ranks highest among all programs.

- **Scale of Job Postings (New England):** Similarly, there was an average of 3,533 jobs posted in New England for professionals in the biology field with at least a bachelor’s degree, which ranks highest among all programs.

- **Median Cohort Analysis/Comparison:** When comparing typical biology cohorts at Unity with typical cohorts among similar institutions (private AASHE members with enrollments between 500 and 1000), the data indicate that enrollment in Unity’s biology program falls below expected levels (four students per year at Unity verses nine per year at comparable schools); this suggests that there may be capacity for growth if comparable schools are enrolling cohorts that are more than twice as large as the biology cohorts at Unity.

- **Employment Projections:** BLS projections for employment growth between 2014 and 2024 show that employment in fields related to biology are projected to grow by 8.2%, which exceeds the national growth rate for all occupations (6.5%).
Biology Findings from the Current Program Report – 3

- **Overall finding for Biology**: As one of the largest bachelor’s degree programs in the country, biology has high demand in the market, and it is expected that it will continue to grow in the future. Furthermore, demand for Unity’s biology program has increased rapidly in recent years as inquiries, applications, and enrollees grew substantially between 2012 and 2016. Demand for the biology program at Unity is still small in scale, but its growth is noteworthy. The Google Analytics data are telling in that they suggest that students are not highly interested in Unity’s specific focus on the environment and conservation when it comes to teaching biology. Small page-view counts indicate that, while large numbers of prospective students are interested in biology, relatively few are interested in learning biology with a specific orientation toward the environment and conservation. It may be beneficial to rename the program environmental biology in order to clarify Unity’s specific approach to biology education and capitalize on the market of prospective students who are specifically interested in environmental biology programs.

- In addition, and as witnessed by other successful and growing programs in biology, offering a more generalized track for people that want the Unity College experience (residential college in Maine focused on sustainability), but would like a more traditional academic experience to prepare them for their professional careers including graduate school, would be beneficial.
Presenting General Biology as an Option

- More needs to be done to message the current BS in biology and market the program to a wider potential audience, specifically students interested in general biology with outcomes directly related to medical/professional schools and research positions with pharmaceuticals, corporations, and government agencies.

- One approach would be to better understand the academic outcomes as listed above. After conducting many of these types of programs for colleges and universities we know that about half of students seeking a biology degree go onto medical/graduate school, whereas many seek employment.

- Unity College has one of the largest employers on the Eastern seaboard in their backyard, the Jackson Laboratory, for outcomes. Over the last year, Jackson Laboratory (Bar Harbor, ME and Farmington, CT locations) had four research assistant II/III positions listed for someone with a broad-base biological sciences undergraduate background to work in the labs. A sample listing is provided on the following slide.
The job title of research assistant II/III for the Jackson Laboratory Bar Harbor, ME, is provided below. As you can see, general biology skills are most important and the most relevant. This would also be a good professional experience opportunity for people wanting to go onto medical or graduate school.
Biology Job Classifications Bachelor’s

- Identifying the likely job titles and responsibilities for someone seeking a bachelor’s in biology is difficult. After reviewing the Burning Glass taxonomy, the following job Burning Glass occupational codes were used to both profile the current market and look at job trends for biology:
  - Biologist
  - Biochemist
  - Microbiologist
  - Medical Scientist
  - Biological Technician
  - Researcher/research associate
  - Laboratory Technologist

- Moving forward, unless otherwise mentioned, “biology” represents the aggregate of all the position types listed above.
**Biology Bachelor’s Skills**

*The top skills for biology in the New England region*

- Biology
- Experiments
- Microsoft Excel
- Clinical Research
- Molecular Biology
- Biochemistry
- Cell Culturing
- Chemistry
- Microsoft Office
- Data Analysis
- Project Management
- Microsoft Powerpoint
- Clinical Trials
- Biotechnology
- Scheduling
- Data Collection
- Budgeting

- **Most of the job postings in 2016 for biology listed specific skills necessary (or preferred) for the position. A total of 200 unique skills were indicated. The most popular skill sets are presented above.**
- **With the exception of Microsoft Office and project management, all of the skills needed for bachelor’s-level biology jobs in the New England area are the standard experiences gained in a biology program. Notice biology is the top skill mentioned.**
Bachelor’s in General Biology Implications

- **Student Demand**: From a demand perspective there seems to be an opportunity for general biology on Unity’s campus. Considering the current demand assessment findings as well as the more broad review of biology programmatic demand, general biology (26.0101) seems like the best choice for Unity College regarding biology options.

- **Academic Outcomes**: Biology is one of those programs that is difficult to isolate in the employment market because of the number of people that go onto graduate/professional school with a biology degree as well as the host of job titles/positions associated with biology. That being said, as one of the largest undergraduate degree programs, and more schools showing growth than decline, it is obviously in demand by students. As a primary feeder for medical and professional schools related to health care, it is hard to envision the need for undergraduate programs to decline as the growth in health care professions increases.

- **Competition**: As mentioned by many, obviously biology is a program that most schools offer in some form or another. However, unlike most other schools, Unity offers a biology program with some targeted niche programs (marine and wildlife) that do pretty well, while the generalized program struggles. Retooling your biology program to a more generalized approach will not provide a competitive advantage in the market, but it will open up Unity to a larger prospective-student market that can easily find other options in the market.
Sustainable Business Enterprise
Sustainable Business Enterprise Nomenclature

- Despite the emphasis on general business skills and curriculum on sustainable business enterprise programs, a sustainable business enterprise curriculum or program definitely varies in terms of nomenclature.

- As illustrated in the program reviews conducted in phase two of the project, programmatic titles and concentrations vary from program to program. Examples include:
  - Sustainable business
  - Sustainable ecotourism
  - Sustainable hospitality management
  - Sustainable management
  - Wildlife and outdoor enterprise management

- Using the job-posting data to better define the name, as well as the specific skills related to sustainable business enterprise positions was conducted.

- Stamats looked for job postings related to sustainability within the Labor Insights job classification system of business management and operations nationwide within the last 90 days requiring at least a bachelor’s degree.

- Although many of the search results revolved around project chain management and sustainability regarding profitability, several examples were identified and are included on the following slides.
The job title of manager responsible sourcing for Nestle USA in Solon, OH, is provided below. As you can see, sustainability is most related to supply and business management practices related to profitability.
The job title of assistant vice president for sustainability planning for New York University in New York, NY, is provided below. As you can see, sustainability is most related to operations and using sustainable practices to benefit both the environment and organizational bottom line.

Assistant Vice President for Sustainability Planning

Institute: New York University
Location: New York, NY
Category:
- Executive - Administrative Vice Presidents
- Admin - Facilities Management

Posted: 04/11/2017
Application Due: Open Until Filled
Type: Full Time
Posting Number: 2016-003

Location: US-NY-New York
Comp Grade: Band 55
School/Division: Office of the Provost (WS1034)
Department Name: Office of the Provost

Position Summary:
The Assistant Vice President (AVP) for Sustainability Planning serves as the chief strategist to foster sustainability at New York University. The AVP will report jointly to the Office of the President and the Office of the Provost to lead the Sustainability Action and support staff in support of University initiatives. In particular, the AVP partners with the Provost’s office on initiatives with the University’s faculty and schools.

The Assistant Vice President serves as the architect and focal point for strategic planning efforts in and around sustainability designed to make NYU among the greenest urban campuses in the nation. In developing policy and implementing short and long-term plans, the AVP will be familiar with – and able to bring to bear knowledge of — existing research in the field, technical advances, understanding of social and behavioral factors, and cross-functional financial management and planning. The AVP will also be responsible for helping create and implement communication strategies to enhance the visibility and awareness of the University’s sustainability efforts.

This position will serve as a key resource in surfacing sustainability initiatives to senior leadership as well as faculty whose academic activity interacts with sustainability and policy. This position will also engage with students and student-based groups that are involved or who have an interest in environmental initiatives. The position will coordinate with the energy group in the Office of Capital Projects & Facilities in the key area of energy efficiencies and savings, as well as coordinate with the leadership of the University’s Global Sites. The position is also responsible for ensuring that sustainability initiatives and policy are compiled with by the different units.

Areas of focus include but are not limited to: (1) policy development, (2) grant development and research for university projects, (3) long and short term planning, (4) technical data gathering, financial modeling and analysis, (5) convening internal and external partners including schools, administrative units, non-profit organizations, governmental entities and other partners to appropriate to identify shared goals.

An experienced and innovative thought leader on national and international sustainability programs and standards, the AVP will identify and explore areas of opportunity to advance the University’s sustainability agenda through a combination of internal, external, public, and private partnerships.

The AVP will monitor emerging trends and oversee progress and development of sustainability initiatives across all NYU sites and locations, including its global sites, and serve as a resource to schools and units in developing sustainability programs that are integrated into decisions and practices. The AVP also works to identify measurement controls for compliance and progress and partners with the Office of Risk Management to ensure that sustainability goals and initiatives are included in the University’s enterprise risk management programs.

Among the strategic areas of focus, the AVP will also identify areas where the University can seek practical opportunities to continuously improve sustainability efficiency. The AVP convenes or participates on committees and workgroups to develop goals, communications, implementation plans and metrics. In partnership with other NYU offices, the AVP will periodically convene internal and external thought leaders to explore future partnerships on common goals such as plans to achieve LEED status for NYU’s buildings, standards for university vendors who conduct business with NYU, and identifying practical solutions to enhance sustainability awareness for members of the NYU community.

Qualifications:

Required Education
Bachelor’s degree (e.g., Public Administration or related field), or equivalent combination of experience.

Preferred Education
Graduate level degree (e.g., MBA, JD, or related field).
The job title of executive director for the US Green Building Council in Boston, MA, is provided below. As you can see, sustainability is most related to building practices but includes management and financial experiences related to running a business.
Diversity of Titles

Just to illustrate, the top business management and operations job postings over the last 90 days (January 18–April 17, 2017) with sustainability are listed above by title. Clearly the marketplace for sustainable business enterprise is broad (greater than 200 titles provided overall).
Business Program Beginnings

- As witnessed in the program reviews as well as the individual job titles and job-posting data, the ability to isolate a name or a couple of names related to sustainable business enterprise is difficult. That being said, using the terminology of sustainable business (without the enterprise part) may be more inclusive.

- Despite the diversity of titles and job responsibilities, having a solid business curriculum core is most important for any new business program anchored around sustainability.

- There are three main accrediting bodies/organizations associated with business programs, and Stamats believes that accreditation, especially for a business program/school, should be the standard in any new program development for a school, given the importance placed on it by both the industry and prospective business (either undergraduate or graduate) students.

- The three main bodies/organizations are:
  - Accreditation Council for Business Schools and Programs (ACBSP)
  - Association to Advance Collegiate Schools of Business (AACSB)
  - International Assembly for Collegiate Business Education (IACBE)

- Since a sustainable business enterprise program would be the only business program at Unity College, and the likelihood of a full business school with multiple majors is unlikely, IACBE accreditation would be the most appropriate starting point for Unity.
IACBE Accreditation

IACBE accreditation “requires the academic business unit to prepare a comprehensive self-study in which it demonstrates the extent to which it complies the IACBE’s ‘Accreditation Principles,’ which are its evaluation for accreditation.” The seven principles are listed below:

- Outcomes Assessment
- Strategic Planning
- Curriculum
- Faculty
- Scholarly and Professional Activities
- Resources
- Internal and External Relationships
- International Business Education
- Educational Innovation

Although accreditation (even candidacy status) cannot be achieved until the program has multiple cohorts of students (at a minimum two years of students), in the design/discussion phase of a new program accreditation concerns should be considered.

Since many of the nine principles listed above have crossover, and are interrelated, examining the two with the most importance in the development stage (faculty and curriculum) seemed warranted at this time.
IACBE Faculty Requirements

- From the accreditation manual: “Excellence in business education requires highly qualified faculty. Therefore, to ensure that the academic business unit’s business programs are properly supported, a high percentage of the undergraduate- and master’s-level student credit hours delivered by the academic business unit must be taught by doctorally-qualified and professionally-qualified faculty members. At the doctoral level, it is expected that all doctoral student credit hours will be taught by doctorally qualified faculty.”

- The main requirements for “doctorally qualified” to teach at the undergraduate level include:
  - PhD in a business with a minor/specialization in the area s/he is responsible for teaching
  - PhD in business with professional licensure in the area s/he is responsible for teaching
  - Hold a JD and teach in areas related to business law
  - Hold a PhD with sufficient graduate business coursework in the area of assigned teaching responsibilities

- To be considered professionally qualified to teach, a faculty member must meet one of the following:
  - Be ABD in business with a minor/specialization in the area s/he is responsible for teaching.
  - Hold a master’s degree in a business-related field and professional certification (C.P.A. for example) in the appropriate area for assigned teaching responsibilities.
  - Hold a master’s degree in a business-related field, and have five or more years of professional experience.
  - Hold a master’s degree in a business-related field, and have completed postgraduate training in the area of assigned teaching responsibilities.
IACBE Curriculum Requirements

- IACBE follows the Common Professional Component (CPC) of undergraduate business programs, as well as other accrediting bodies. The CPC includes the following eight content areas:
  - Accounting
  - Marketing
  - Finance
  - Management, including management principles, organizational behavior, human resource management, and operations management
  - Economic/Social/Legal Environment, including legal environment of business, economics, and business ethics
  - Decision support tools, including information systems and quantitative methods/statistics
  - Global Dimensions of Business
  - Integrative Experiences—examples include strategic management/business policy, internship, or capstone experience

- All content areas need to be covered in the curriculum, however, there does not need to be equal weighting across all eight areas (60 credits in the major/8 areas=7.5 credits per area).

- “There is no requirement that each CPC topical area must be covered by a specific course. It is expected that the business faculty will ensure that business curricula devote adequate attention and time to ethical, legal, societal, and economic components, both domestically and globally.”
Curriculum and Faculty Patterns

- During the second phase of this project Stamats reviewed six schools that had different versions of sustainable business enterprise. Despite the diversity of school types (flagships, regional publics, and faith-based religious institutions) the takeaways are very similar, mainly the curriculum and faculty demographics.

  - **Curriculum**
    - All but Kansas State University and the University of Wisconsin programs are an undergraduate business core with a specialization/concentration in sustainability.
    - The Kansas State program looks at sustainability from a natural resources vantage point as opposed to a business operations.
    - The University of Wisconsin program is a degree-completion program and requires students to have an associate’s degree (or 60 credit hours) prior to admittance and, therefore, it is not a fair comparison.

  - **Faculty demographics**
    - All of the programs where faculty biographical information were available had a strong proportion (40% or more) with terminal degrees and full-time faculty rank. Aquinas College and CSU Monterey Bay provided faculty demographics at the program level (as opposed school of business/agriculture level) and both had more tenured faculty positions than adjuncts.

- It appears that a core business curriculum with a reliance on nonadjunct faculty is the industry standard among programs currently offered (even for faculty at the University of Wisconsin and Kansas State University, which do not offer a business core curriculum).
Sustainable Business Implications – 1

- There is nothing to suggest that the demand for a sustainable business enterprise program does not exist. However, the name sustainable business enterprise should be revisited. Keeping the name tied to the outcome and/or curriculum is important. For the two programs that did not have a true business core, one did very well indicating the purpose (Kansas State University and resource sustainability) and the other did not do very well (University of Wisconsin). If this program is offered, and it is focused on the business management/operations spectrum (which Stamats would encourage), a title like sustainable business practice or even just sustainable business would be advised.

- If concentrations such as eco-tourism or hospitality management are to be developed, as at CSU Monterey Bay, it would be better to keep the general program as unspecific as possible in terms of broad market appeal, but with various concentrations/emphases for those who want a more focused academic experience.

- Although you generally want to hire faculty before developing the curriculum, in this case you need to hire faculty to meet the curriculum. A total of four or five professional or doctorally qualified faculty need to be hired in all likelihood over the next few years as you move towards accreditation. Unity will most likely need to hire a management professor, an accounting professor, a finance professor, a marketing professor, and a business systems/technology professor in order to address all parts of the curriculum as required by accrediting bodies.
Sustainable Business Implications – 2

- Regarding the curriculum for a sustainable business program, this would be a foundational shift from the current academic portfolio at Unity. Most of the programs identified had a strong business curriculum. Does Unity have the ability and willingness to move towards a more professional program offering compared to the more traditional sciences that are currently offered? Does this fit with the mission of Unity College? Unity College 2.0?

- Despite the critical mass for Unity, is the return on investment (ROI) actually there for this program? According to Oklahoma State University 2015–2016 Faculty Salary Survey by Discipline report, hiring four or five doctorally trained business faculty would be upwards of $500,000 in additional faculty salary budget lines, not including benefits and professional-development dollars needed.

- For the 2015–2016 reporting year, new assistant professors for CIP code 52.0201 (business administration and management) were averaging between $123,802 and $142,716 for a nine-month salary. Although the Oklahoma State University figures are primarily for doctoral research institutions, it is unreasonable to think that the going rate for business faculty (either professionally trained or having a PhD) is significantly below $100,000 for non-flagship institutions.
Sustainable Business Implications – 3

- Accreditation is not necessary but is a good practice. Although the process is specific and detailed, overall the process is not as daunting as many would suspect for the lower-tier accreditation (IACBE) that is the most appropriate for Unity College at this time. That being said, the accreditation requirements, procedures, and processes probably do not lend themselves to the current vision for Unity College 2.0. The processes and procedures are more traditional in nature, and probably more appropriate for a more traditional academic learning model.

- From a go-to-market vantage point, sustainable business enterprise may be more realistic in the current Unity College portfolio as opposed to a new business unit. Unity (no assumption regarding effectiveness) has already defined a target market recruitment strategy and knows where to find students that are attracted to the current culture. Unity College 2.0 as a program landing spot may need more thought and consideration since it is a very different student market with different wants and needs. The marketing strategy for sustainable business enterprise at Unity College 2.0 would need to be substantially different than the current approach. Can all of this be completed in a relatively short time frame (18–24 months)?
Final Thoughts
Implications and Next Steps – 1

- Amongst the programs reviewed in this engagement (natural sciences and sustainable business) the only new program that could be offered by Unity that generates the level of enrollment needed to be financially viable is sustainable business. Repackaging/branding the general biology program is probably also prudent and could raise enrollment, but maybe not drastically. That being said, the increased revenue of even five students would be consequential considering the large amount of overhead currently being underutilized at Unity (faculty). In addition, those five students may be more of a net positive to the institution than even a sustainable business program, even if the business program could generate closer to the ideal Unity cohort size of around 12–14 degrees conferred per year given the substantial investment needed in faculty hires over the next couple of years.
Implications and Next Steps – 2

- Regarding the go-to-market timeline, Stamats understands that it takes time to gain the necessary approvals (both internal and external) to launch a new program. That being said, these data (employment and degree-conferment trend data) are snapshots of the market currently. A lot could happen in the next year or two, and there is no guarantee that the opportunities that exist today will be there in the future. It would be prudent to work in to both the timeline and budget a couple of “market checks” to assess the situation and determine if anything has disrupted the market, or if other competitors have identified a similar opportunity and are marketing/promoting a new program similar to the proposed sustainable business program.

- Since Unity is not going to be first to market for sustainable business, even in Maine, doing it right is more important than doing it first.

- Lastly, we know from working with other clients that any new program, regardless of student demand, employment trends, and competitive pressure, requires a champion (or champions) who is/are committed to the success of the program and willing to put in the time and effort needed to make the program grow and develop. Unfortunately (or fortunately depending on your vantage point), that should come from the faculty. Does each program have such an individual or group of individuals, and does their vision for the program look similar to the administration’s vision for the program? If not, there is a problem. Stamats knows that marketing can make an average program stronger in terms of enrollment, but it is nearly impossible to market a program that is weak (by either perception or reality), or even worse, a program that has no passion from their faculty.
Appendix A:
Like-School List
Unity-Like School List

Agnes Scott College
Albion College
Austin College
Beloit College
Bluefield College
Catawba College
Central College
Coe College
Colby-Sawyer College
Doane College—Crete
Earlham College
Eureka College
Goshen College
Hampshire College
Hanover College
Harvey Mudd College
Haverford College
Johnson C Smith University
Kalamazoo College
Knox College
Martin Methodist College
Maryville College

Monmouth College
Northland College
Paul Smiths College of Arts and Science
Pitzer College
Principia College
Randolph College
Saint Joseph College
Scripps College
Sweet Briar College
Unity College
Warren Wilson College
Wells College
Wesleyan College
William Peace University