Academic Science Program Task Force
Final Report
March 2, 2012

Background

As an outcome of the Strategic Realignment Recommendations from March 15, 2011, the Provost formed the Academic Science Program Task Force in May 2011. This Task Force was charged to determine the best ways to enhance the natural synergies between the science programs at NCSU and to promote interdisciplinary collaboration and research while reducing administrative overhead. The task force understood its charge is to recommend improvements for the overall quality and delivery of NC State science programs at the undergraduate and graduate levels, as well as improving university research and extension activities. Further, The Pathway to the Future: NC State's 2011-2020 Strategic Plan, approved April 2011, provided guidance on strategic direction. The task force met from May 2011 through February 2012. Minutes of the meetings and additional background materials are posted on the provost's web site: http://go.ncsu.edu/academic-science

Assessment of Overarching Issues

Task Force discussions focused on the identification of problems or barriers to improving the overall quality and delivery of science programs. In addition, College Deans were interviewed, campus forums were held and a campus-wide survey undertaken to provide additional input and perspective. Many issues identified by the task force were mirrored in the concerns collected from across campus. A summary of survey input is provided in Appendix A. In general, concerns relate to leadership, culture and resources and are articulated in the bulleted list below.

- Mission/vision disconnects at different levels (e.g., college/department, department/faculty).
- Misalignment of resources, mission and needs.
- Enrollment management.
- Lack of shared or core research facilities.
- Limited support for graduate students.
- Inefficient use of scarce start-up dollars.
- Lack of credit or support for faculty engaged in cross-departmental/college work.
- Curriculum stagnation.
- Location (e.g., proximity of faculty to one another).

The task force believes that the implementation of any of the proposed changes to academic structures without corresponding attention to issues of leadership, culture and resources will not lead to successful outcomes.

Guiding Principles

The task force developed a set of 'guiding principles' to inform the process.

1. High quality physical, chemical, biological, and mathematical sciences are predominantly housed in six of the ten NCSU colleges (CALS, PAMS, CNR, COT, CVM, and COE). Proposals to modify the academic structure at NCSU should maintain and enhance our strengths, allow for the growth of emerging areas, and build in commitments to cross-college collaborations and interactions.

2. NCSU has a strong reputation for a basic through translational and application science approaches. In promoting alternative academic structures, NCSU can transition from solid strength to leadership excellence.

3. Institutional focus on the complex problems of society referred to as the Grand Challenges in the Strategic Plan will require multi-disciplinary expertise from all ten colleges and the academic structures and rewards need to support these collaborations.

4. Successful implementation of structural change must include comprehensive consideration and alignment of issues of leadership, culture, and resources.

Review of Academic Structure

The work of the committee included benchmarking academic structures at our official NCSU peer institutions as well as Task Force identified aspirational peers in specific areas. Benchmarking efforts included comparisons of college and departmental structures, as well as, noting examples of horizontal or bridging structures present at our peer institutions. Benchmarking included a university-wide evaluation of college structure and department level evaluation of units similar to the NCSU's Colleges of Agriculture and Life Sciences, Natural Resources and Physical and Mathematical Sciences. In addition, a representative (but not exhaustive) group of example horizontal or bridging structures was documented. The details of this work are provided in Appendix B.

This review of our peer institutions' structures reveals many variations of academic structure. The number and mix of colleges varied most with respect to those with or without a medical school. Specifically with respect to the sciences, the structure and breadth of biological sciences programs varied widely. The various structures include:

1. multi-departmental coverage organized around a broad range of sub-disciplines within the biological sciences (e.g., Ecology and Evolutionary Biology, Cell Biology, Genomic Science, Chemical Biology, Structural Biology and Neurobiology),

2. distribution of departments representing the sub-disciplines distributed across multiple colleges (typically examples include biological sciences located in the College of Agriculture, the College of Science (or the College of Arts and Sciences), and the College of Veterinary Medicine),

3. establishment of a College of Biological Sciences at three institutions included in the benchmarking effort, UC Davis, Univ. of Minnesota, and UC San Diego (called a Division but reporting directly to the VC for Academic Affairs), and

4. university-wide efforts in the delivery of undergraduate biological sciences programs that involve multiple colleges (e.g., Univ. of Wisconsin-Madison offers over thirty different 'biology' majors within six different colleges).

Recommendations

The recommendations of the task force focus on three driving forces. One is the need to develop more flexible, responsive structures on campus for collaboration and innovation. Success requires both strong disciplines and strong interdisciplinary teams capable of addressing complex problems. Two is the need to build core capabilities that serve multiple interests across campus. Core facilities supported by, and accessible to, multiple constituencies could provide opportunity for improved quality with reduced cost. Three is the growth in demand for the biological sciences not only within life sciences, agriculture, natural resources and engineering programs but also at the interface of the physical, chemical and biological sciences in new and emerging programs. Increased demand for courses and degree programs at the undergraduate level, for graduate education across a variety of degree programs and access to high quality biological sciences programs at the interdisciplinary interfaces has outpaced the University's ability to deliver excellence. Further, biological sciences as a discipline have grown such that there is a need for differentiation, reorganization and realignment or focus that reflects the current hierarchy and future opportunities of modern biology.

Recommendations are presented in two parts. The first set of recommendations focuses on the need for an increased number of horizontal structures on campus to encourage and reward faculty for cross-college productivity. The second set of recommendations focuses on the need to address the growth in the biological sciences and to facilitate its interactions with other sciences on campus.

Horizontal Structures

Horizontal structures should be implemented across colleges and departments to facilitate interdisciplinary groups. In addition to departmental and college structure, there is a need for efficient and effective structures, and the commensurate rewards for faculty working across these traditional academic boundaries. Strong horizontal structures across colleges and departments can facilitate the success of interdisciplinary groups working on the complex problems. Task Force discussions on examples of successes at NCSU (http://www.provost.ncsu.edu/governance/task-forces/academic-science/2011/as-2011.php#interdisciplinary) and elsewhere led to the articulation of recommended 'best practices' for successful horizontal (interdisciplinary) structures. Further, the recommendation is that NCSU use these structures to address emerging areas and especially in cases where formal restructuring of departments and colleges in not warranted. An idealized schematic of potential horizontal structures is presented in Figure 1 below.

These structures, referred to as academies, should function as follows:

1. Academies should cut through colleges and departments and be defined relative to a Grand Challenge.

2. Academies should be temporary and must include criteria for creating and sun-setting any new structures.

3. Faculty should be appointed (following RPT protocols) in departments and may self-select to participate in academies as appropriate.

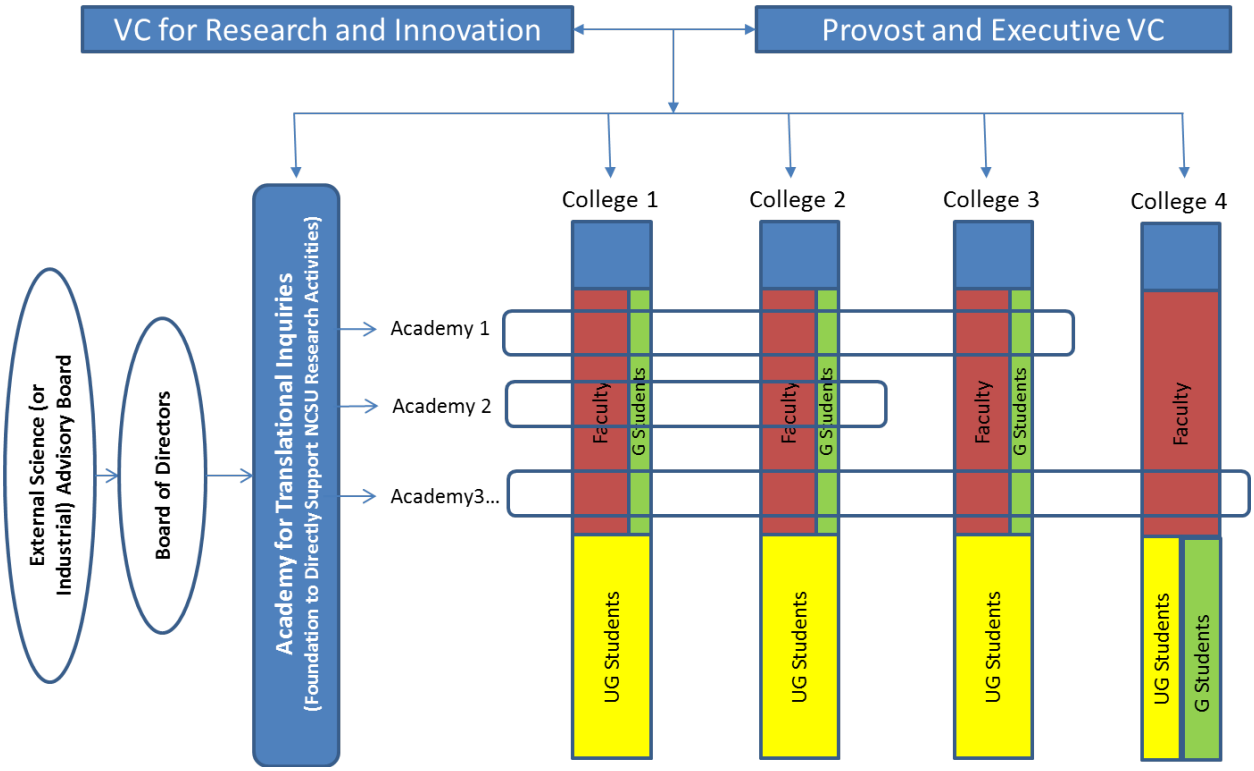

Figure 1. Example schematic for organization of horizontal structures.

4. Faculty should be rewarded in promotion and tenure decisions for their creativity, scholarship and successes within the academies. This is consistent with an emphasis on encouraging interdisciplinary faculty and programs in the Strategic Plan.

5. Participation in academies should complement, not compete with, departmental or college level interests.

6. Curricula should not define an academy, but may be associated with and supported by the faculty housed by the academy. Further, the use of umbrella degrees to allow for more flexible programs of interdisciplinary study as outlined in the Strategic Plan may facilitate curricular efforts.

7. Faculty and graduate students are the most likely participants in academies, although undergraduate researchers should be strongly encouraged.

8. Graduate student appointments in an academy must not have departmental or college related barriers (either in funding streams, in curricular requirements, or in working with faculty).

9. Academies could facilitate the development and use of core facilities, shared research facilities, and start up packages.

10. Academies will need a resource stream, commensurate with their success, allocated from central resources (F&A, funds from Provost, etc.) and self-support (contracts and grants). In addition, emphasis should be put on identifying gifts and/or endowments to support students and research.

Structure to Support Ongoing and Emerging Growth in the Biological Sciences

NCSU has evolved from the North Carolina College of Agriculture and Mechanic Arts to a comprehensive university represented by ten colleges. The current NCSU academic structure reflects the history and growth of the university. The biological sciences are driving discovery and development in the 21st century in unprecedented ways and need to emerge to play a leading role at NCSU just as the physical and mathematical sciences did when PAMS was formed over 50 years ago. The pervasive nature of biology in so many of the disciplines on campus, the increasing interest and curricular demand from engineering, and the convergence of disciplines at the boundaries of sciences, require flexibility and possible reorganization of university structures to allow for growth and excellence.

To stimulate discussion, the Task Force developed several conceptual frameworks for organizing around the hierarchy of modern biology *assuming* the opportunity to start with a clean slate. For example, Ecology and Evolution, Plant Sciences, Genetics and Genomic Sciences, Cellular and Developmental Biology, Quantitative Biology, Human and Animal Science, Neuroscience, Systems Biology, Synthetic Biology, Molecular and Structural Biology and so on emerged from discussions as areas of importance. However, the real world is not a clean slate and while the discussions within the Task Force may provide a starting point going forward, we recommend that a broad-based faculty with expertise in the biological sciences be engaged in the details of differentiation, reorganization and focus of the biological sciences. In addition, the faculty in any impacted academic structure must be engaged in the details of the implementation.

Because of the confounding issues of leadership, culture and resources and the impact of these factors on the certainty of outcome, the approach the task force took was to explore multiple models of academic structure relative to the biological sciences and the current department and college structures. Consistent with that approach, the task force recommends three models be considered for implementation. These models differ in scope and scale of potential reorganization from department, college and university perspectives and these models are independent of the need to develop and implement successful horizontal structures.

Three approaches are outlined below.

Model 1) Use structure *locally* to enhance the biological sciences. Review the biological sciences within CALS. Determine the need for reorganization, differentiation and refocusing of departmental structure and implement change as needed and appropriate within the college. Create a School of Life Sciences and a School of Agriculture to provide differentiated visibility, focus and resource allocation along with clear mechanisms to foster and reward interschool collaborations and programming.

Model 2) Use structure *regionally* to enhance the biological sciences. Create a School of Biological Sciences that spans multiple colleges providing greater access, visibility and focus to existing and emerging programs both in and outside of CALS. Determine the need for reorganization, differentiation and refocusing of departmental structure and implement change as needed and appropriate within the School and participating colleges. Departments within the School could be associated with a single college, or participating colleges could share in the administration of a department(s). For shared departments, there must be well-defined policies for programmatic decisions, financial support and resource allocation, and faculty review and promotion that reflect the shared structure.

Model 3) Use structure *centrally* to enhance the sciences at NCSU. Create a 'College of Science' to bring visibility and focus to the university's commitment to the sciences in general and to administratively co-locate the physical, chemical, biological and mathematical sciences in particular. Differentiation and reorganization of the biological sciences will inform the relationship between reconstituted departments and college affiliation. Individual faculty from across the University whose expertise and research areas align with the academic structure of 'College of Science' should have the opportunity to move to the new college. Additionally, alternative bridging structures that span multiple colleges may be created to promote cross-college connectivity and support co-administered programs as appropriate.

In order to provide additional background to contextualize these recommendations, the following points are emphasized.

1. Modernizing our portfolio of biological sciences and improving campus-wide access to high quality programs in biological sciences is critical to our growth as an institution.

2. When considering any change in academic structure, faculty need to be included in discussions and given options with respect to appointments within newly formed structures.

3. The present and future demand for high quality biological sciences in both graduate and undergraduate programs and for majors and non-majors must be met with a comprehensive campus-wide vision with respect to resources, access, and quality.

4. Foster academic and scientific interactions of the biological sciences with the engineering, agricultural, biomedical, physical, and chemical disciplines on campus toward the goal of a "converging science" to address pressing societal challenges.

5. The future build out of the master plan on the Centennial Biomedical Campus will provide opportunities for growth in both graduate and undergraduate programs in the biomedical sciences.

6. Anticipated growth in the biological sciences will require additional resources. This need for new resources could be partially met by campus-wide efforts in realigning resources as articulated in and consistent with the University Strategic Plan.

7. Further review of program metrics (e.g., outcomes from the Task Force on Review of Academic Programs) will be instrumental in evaluating departmental structure.

Summary Comments

NCSU is a tremendous educational and economic resource for the citizens of North Carolina. It is a nationally recognized leader in many fields. Nevertheless, like many Universities across the country, NCSU is being pressed to focus its limited resources on the high-quality, high-impact programs that are significant, innovative and valued. At the same time, the University cannot afford to do everything, and not all programs are equally valuable. However, it is crystal clear that biological sciences offer tremendous growth opportunities for current and future NCSU students and for the state as a whole. This Task Force has worked to identify structures that will set the University on the course for future successes with undergraduate and graduate education, and nationally competitive research programs. The Task Force is fully cognizant that with change comes the risk of disruption. On the occasion of our 125th anniversary celebration, it is also clear that 'business as usual' will not allow the University to seize the opportunities to grow and thrive for another 125 years.

APPENDIX A. Campus survey response.

What do you see as the key positive and negative issues surrounding the academic science programs at NC State?

PROBLEMS	**# of RESPONSES**
• Funding	19
• Lack of cross college and/or cross department coordination	17
• Culture of the faculty and of the leadership	15
• Lack of core facilities	7
• Business operations	7
• Disconnect between sciences with social sciences	5
• Too many colleges	4
• The RPT process for faculty who do interdisciplinary work	3
• Centralization and college control	2
• Physical location of faculty	1

If you could reorganize/improve the overall academic science program at NC State, what would you do? Are there other programs/universities you would look to as models?

SOLUTIONS	**# of RESPONSES**
• Create 'horizontal structures', umbrella programs, etc.	24
• Restructure departments and colleges	12
• Focus on budget reallocation to fix problems	9
• Consolidate and/or reorganized departments in CALS	4
• Invest in core facilities	1
• Decentralize to allow for more college autonomy	1
• Institute departmental chairs (not heads)	1
• Fix in RPT for interdisciplinary faculty	1
• Invest in more faculty	1

Appendix B. Benchmarking Academic Structure

In order to consider the variety of academic structures that could be successful, a review of college and departmental structures at our university peers was undertaken. For specific program areas, an additional group of 'aspirational peers' were selected by Task Force members for comparisons with the Colleges of Agriculture and Life Sciences, Natural Resources and Physical and Mathematical Sciences. The set of universities considered is presented in Table 1 below. Note, all research was web-based and therefore reflects organizational structures as reported on university, college and department websites during the time of this work (November 2011 – February 2012).

Table 1. List of universities included in the review of college and departmental structure. (^ aspirational peer)

College Comparisons	**Departmental Comparisons**		
NCSU Official Peers 2012	*Agriculture and Life Sciences*	*Physical and Mathematical Sciences*	*Natural Resources*
Colorado State	Michigan State	Georgia Tech	Colorado State
Georgia Tech	Purdue	Texas A&M University	Virginia Tech
Iowa State	Texas A&M	University of Wisconsin-Madison	Oregon State^
Michigan State	Univ. of California-Davis	Cornell University^	SUNY-ESF/Syracuse University^
Ohio State	Virginia Tech	University of Minnesota^	Univ. of Washington^
Penn State	Cornell University^	Univ. of California-San Diego^	
Purdue		Univ. of Washington^	
Rutgers-New Brunswick			
Texas A&M			
Univ. of Arizona			
Univ. of California-Davis			
Univ. of Florida			
Univ. of Illinois at Urbana-Champaign			
Univ. of Maryland-College Park			
Univ. of Wisconsin-Madison			
Virginia Tech			

College Structure

Table 2 and 3 present the college structure of our peer institutions in relationship to the NCSU college structure. Table 2 compares NCSU with peer institutions without medical schools and Table 3 compares NCSU with peer institutions with medical schools. For each table the information is organized to facilitate comparison of college structure. The intent is to compare major academic units (e.g., colleges and/or schools) reporting directly to university provosts. Sub-units such as schools within colleges are not included in this table, unless otherwise noted. The ten NCSU colleges are listed in the left hand column and compared with what are considered to the comparable college at the peer institution in the subsequent columns. For example, at Colorado State University there is a College of Agricultural Sciences that is matched with our College of Agricultural and Life Sciences. In cases where no matching college exists (e.g., Georgia Tech does not have a College of Veterinary Medicine or a College of Agriculture) the cell is left

blank. In some cases, a single college may span two other colleges (e.g., Liberal Arts and Sciences at Iowa State) and thus is noted twice (both for NCSU PAMS and CHASS). In one case, Michigan State, two colleges (the College of Arts and Letters and the College of Social Science) are matched with the NCSU College of Humanities and Social Sciences. Finally, if a university has colleges in addition to those that match with NCSU (e.g., College of Computing at Georgia Tech) these colleges are listed alphabetically at the bottom of the table.

In general, the table brings attention to the number of and, at a high level, the range of disciplines that these universities support. At that high level, and with respect to the comparisons with CALS, PAMS and CNR, there is a diversity of approach to organizing 'science' that suggests a range of structural approaches can be successful. For example, Agriculture Science is within a single college at Penn State, Purdue, and Colorado, paired with Life Sciences at Iowa, Virginia Tech, Texas A&M, Arizona, Florida and Wisconsin-Madison, with Environmental Sciences at UC Davis, Ohio State, Illinois and with Natural Resources at Maryland and Michigan. At our peer institutions, Natural Resources is a single unit at Colorado State, paired with Agriculture at Maryland and Michigan (as above) and with Environmental Sciences at Virginia Tech and Ohio State. Our College of Physical and Mathematical Sciences is unique in name and for the purpose of Tables 2 and 3, PAMS is generally aligned with the broad based 'science' college for each of the universities where it exists.

Departmental Structure

The next step was to develop comparable comparisons at the departmental level to provide a more detailed mapping of discipline or program to college structure. Only a subset of universities was examined based on the committee's preference to identify aspirational peers for each of the three colleges (CALS, PAMS and CNR). The comparison list is presented above in Table 1 and the results of the comparisons are presented in Tables 4-a, 4-b, 5, 6 and 7 below. The layouts of the tables are similar to that used to compare and contrast college structure.

***College of Agriculture and Life Sciences*:** In Table 4-a, NCSU College of Agricultural and Life Sciences is presented in the left hand column and the departments are listed alphabetically by row. Five of our official peers (Michigan State, Purdue, Texas A&M UC Davis and Virginia Tech) and Cornell University are compared in the remaining columns. Attempts were made to match 'like departments' leaving the cell blank when there is no match and identifying additional departments in those colleges (but not at NCSU) in the following table, Table 4-b. By drilling down to department level, we can identify for example that while NCSU has both Crop Science and Soil Science departments, Cornell, Michigan State and Texas A&M have Soil and Crop Science Departments (or vice versa). In addition, a number of universities have or are in the process of reorganizing the plant sciences (e.g., UC Davis Plant Science Department includes Crop and Ecosystem Science, Horticultural Science and Agricultural Plant Biology and Cornell is in the process of reorganizing the plant sciences). NCSU has plant science departments such as Crop Science, Horticultural Science, Plant Pathology and Plant Biology. At present, faculty from these four departments as well as Genetics, Forestry and Biochemistry are working to develop an interdepartmental graduate program in Plant Sciences (http://www.provost.ncsu.edu/governance/task-forces/academic-science/2011/as-2011.php#interdisciplinary).

Perhaps the most notable in this exercise is the absence of a Biology Department in any of the selected comparison colleges. In stating this, it is important to differentiate that this is not a statement of the absence of biology as a discipline in these colleges of agriculture but the absence of a stand-alone Biology Department. In order to understand college and departmental structure for biology or the biological sciences, the location of departments with 'bio' in the departmental name outside of the college of 'agriculture' was identified and reported in Table 5. Purdue, Texas A&M and Virginia Tech have Colleges of Science, Michigan State a College of Natural Science and Cornell a College of Arts and Sciences that support 'bio' related departments. For completeness, Table 6 was developed to examine the location of biology departments of our official peers not otherwise represented in Tables 4a, 4b and 5.

***College of Physical and Mathematical Sciences*:** The universities selected for comparison of Science colleges are Georgia Tech, Texas A&M and Wisconsin-Madison (NCSU peers) and Cornell, UC San Diego, University of Minnesota and University of Washington (committee selected aspirational peers). These data are presented in Table 6. The structure varies considerably from large colleges of arts and sciences (Cornell, Washington, Wisconsin-Madison) to more narrowly defined colleges of science(s) (Georgia Tech, Texas A&M). In some instances, the academic structure allows even more focus as evidenced by the Colleges or Divisions of Physical Science (UC San Diego), Biological Sciences (UC San Diego and Minnesota) and of the Environment (Washington). In these cases, multiple colleges are identified in Table 6 to capture the broader range of the sciences.

Department(s) that appeared most like NCSU PAMS units were also identified and noted in Table 6. If the unit does not exist in the designated science college the cell was left blank. In all cases, the comparison group has departments of Chemistry, Mathematics and Physics. In addition, science departments in the colleges that are not in PAMS were identified and noted in the bottom of the table, 'other academic units'.

The college 'location' of the biological sciences and the marine, earth and atmospheric sciences vary most across these institutions. In all but the universities with a College of Biological Science, these units also have either a Biology department (Georgia Tech, Texas A&M, Washington) or multiple departments (Cornell and Wisconsin) representing a range of biology topics. The Biological Science units have four to six separate 'biology' departments. Three institutions (Georgia Tech, Minnesota and Wisconsin) in the comparison group organize the marine, earth and atmospheric sciences in the primary college of science. Cornell organizes it within engineering and the others have specific structures to support the discipline (e.g., Texas A&M: College of Geosciences, UC San Diego: Scripps Institution of Oceanography and Washington: College of the Environment). The College of the Environment, like the Colleges of Biological Sciences bring focus to these specific disciplines that emphasizes their importance to their home university.

College of Natural Resources: The comparison group for the College of Natural Resources consists of two NCSU peers (Colorado State and Virginia Tech) and three committee selected institutions (Oregon State, SUNY-ESF/Syracuse and University of Washington). The college names represent a range of disciplines variously organized together as natural resources, forestry and environmental science. Oregon State's College of Forestry is most like NCSU College of Natural Resources based on departmental structure, Table 7. SUNY-ESF/Syracuse and University of Washington have the broadest range of disciplinary representation by department.

Alternative Horizontal or Bridging Structures

Using the academic structure review of the NCSU peer and task force defined aspirational peer group, a variety of horizontal structures can be identified. A subset are noted below that relate to discussions held by the task force that inform our recommendations on academic structure.

Internal to a single college

University of Illinois-Urbana Champaign, College of Liberal Arts and Sciences

School of Integrative Biology

http://sib.illinois.edu/

School of Molecular and Cellular Biology

http://mcb.illinois.edu/

University of Rutgers-New Brunswick, College of Arts and Sciences

Division of Life Sciences

http://lifesci.rutgers.edu/

UC Davis, College of Agricultural and Environmental Sciences

Division of Agricultural Sciences

http://www.aes.ucdavis.edu/departments/centers/agricultural-sciences

Division of Environmental Sciences

http://www.aes.ucdavis.edu/departments/centers/environmental-sciences

Division of Human Sciences

http://www.aes.ucdavis.edu/departments/centers/human-sciences

Cross-college structure

Iowa State, Colleges of Agriculture and Life Sciences and Liberal Arts and Sciences co-administer the following departments:

Biochemistry, Biophysics & Molecular Biology

http://www.bbmb.iastate.edu/

Ecology, Evolution & Organismal Biology

http://www.eeob.iastate.edu/

Genetics, Development & Cell Biology

http://www.gdcb.iastate.edu/about_dept/

University wide

Colorado State University

School of Global Environmental Sustainability

http://sustainability.colostate.edu/

University of Washington

Program on the Environment

http://depts.washington.edu/poeweb/

University of Wisconsin-Madison

Nelson Institute for Environmental Studies

http://www.nelson.wisc.edu/

Penn State

Institutes of Energy and the Environment
http://www.psiee.psu.edu/
Huck Institutes of the Life Sciences
http://www.huck.psu.edu/

University wide for the instruction of biology

University of Minnesota, College of Biological Sciences Biology Program

"has administrative and instructional responsibility for introductory biology courses… approximately 4000 students attend our courses annually"
http://www.cbs.umn.edu/bioprog/about/

University of Wisconsin-Madison, Institute for Biology Education

"30 different bioscience majors across six different schools and colleges"
http://www.biology.wisc.edu/

Cornell University, Office of Undergraduate Biology

The program is composed of faculty from the Colleges of Agriculture and Life Sciences, Arts and Sciences, and Veterinary Medicine.
http://biology.cornell.edu/

NCSU	Colorado State	Georgia Tech	Iowa State	Purdue	Rutgers - New Brunswick	Univ. of Illinois - Urbana-Champaign	Univ. of Maryland - College Park	Virginia Tech
Colleges	Similar/Equivalent Colleges/Schools							
Agriculture & Life Sciences	Agricultural Sciences		Agriculture and Life Sciences	Agriculture	Environmental And Biological Sciences	Agricultural, Consumer and Environmental Sciences	Agriculture and Natural Resources	Agriculture and Life Sciences
Design		Architecture	Design				Architecture, Planning, & Preservation	Architecture and Urban Studies
Education				Education	Education	Education	Education	
Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering
Humanities & Social Sciences	Liberal Arts	Liberal Arts	Liberal Arts and Sciences	Liberal Arts	Arts and Sciences	Liberal Arts and Sciences	Arts and Humanities	Liberal Arts & Human Sciences
Management	Business	Management	Business	Management	1) Management and Labor Relations 2) Business	Business	Business	Business
Natural Resources	Natural Resources						Agriculture and Natural Resources	Natural Resources and Environment
Physical & Mathematical Sciences	Natural Sciences	Sciences	Liberal Arts and Sciences	Science	Arts and Sciences	Liberal Arts and Sciences	Computer, Mathematical and Natural Sciences	Science
Textiles								
Veterinary Medicine	Veterinary Medicine & Biomedical Sciences		Veterinary Medicine	Veterinary Medicine		Veterinary Medicine	Veterinary Medicine (w/ Virginia Tech)	Veterinary Medicine (w/ Univ. of Maryland)
Other Colleges not at NCSU	Other Colleges/Schools							
	Applied Human Sciences	Computing	Human Sciences	Health and Human Sciences Pharmacy Technology	Applied and Professional Psychology Arts Communication and Information Nursing Pharmacy Planning &Public Policy Social Work	Applied Health Sciences Fine and Applied Arts Labor and Employment Relations Law Library and Information Science Media Medicine (Undergrad) Social Work	Behavioral and Social Sciences Information Studies Journalism Public Health Public Policy	

Table 2. College Structure Comparisons: NCSU and official peers <u>without</u> medical schools.

NCSU	Michigan State	Ohio State	Penn State	Texas A&M	Univ. of Arizona	UC Davis	Univ. of Florida	Univ. of Wisconsin - Madison
Colleges	Similar/Equivalent Colleges							
Agriculture & Life Sciences	Agriculture and Natural Resources	Food, Agricultural, & Environmental Sciences	Agricultural Sciences	Agriculture and Life Sciences	Agriculture and Life Sciences	Agricultural and Environmental Sciences	Agricultural and Life Sciences	Agricultural and Life Sciences
Design			Arts & Architecture	Architecture	Architecture & Landscape Architecture		Design, Construction and Planning	
Education	Education	Education and Human Ecology	Education	Education & Human Development	Education	Education	Education	Education
Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering	Engineering
Humanities & Social Sciences	1) Arts and Letters & 2) Social Science	Arts and Sciences	Liberal Arts	Liberal Arts	Humanities*	Letters and Science	Liberal Arts and Sciences	Letters and Science
Management	Business	Business	Business	Business School	Management	Management	Business Administration	Business
Natural Resources	Agriculture & Natural Resources	Environment and Natural Resources						
Physical & Mathematical Sciences	Natural Science	Arts and Sciences	Science	Science	Science*	Letters and Science	Liberal Arts and Sciences	Letters and Science
Textiles								
Veterinary Medicine	Veterinary Medicine	Veterinary Medicine		Veterinary Medicine & Biomedical Sciences		Veterinary Medicine	Veterinary Medicine	Veterinary Medicine
Other Colleges not at NCSU	Other Colleges							
	Communication Arts and Sciences Human Medicine Law Music Nursing Osteopathic Medicine	Dentistry Law Medicine Nursing Optometry Pharmacy Public Affairs Public Health Social Work	Communications Earth and Mineral Sciences Health &Human Development Information Science & Technology Law Medicine (Reports to Sr. VP of Health Affairs) Nursing	Geosciences Government and Public Service *Texas A&M Health Science Center:* Biomedical Sciences Dentistry Medicine Nursing Pharmacy Rural Public Health *TAMU HSC reports to VC Health Affairs of TAMU System*	Fine Arts* Law Medicine Nursing Optical Sciences Pharmacy Public Health Social & Behavioral Sciences* **Part of Colleges of Letters, Arts and Science*	Biological Sciences Law Medicine (includes School of Nursing)	Dentistry Fine Arts Health and Human Performance Journalism and Communications Law Medicine Nursing Pharmacy Public Health and Health Professions	Human Ecology Law Medicine and Public Health Music Nursing Pharmacy

Table 3. College Structure Comparisons: NCSU and official peers <u>with</u> medical schools.

NCSU	Cornell^	Michigan State	Purdue	Texas A&M	UC Davis	Virginia Tech
College of Agriculture and Life Sciences	*College of Agriculture and Life Sciences*	*College of Agriculture and Natural Resources*	*College of Agriculture*	*College of Agriculture and Life Sciences*	*College of Agricultural and Environmental Sciences*	*College of Agriculture and Life Sciences*
Departments in CALS	Similar/Equivalent Departments					
4-H Youth Development and Family & Consumer Sciences			Youth Development and Agricultural Education			
Agricultural and Extension Education						Agricultural and Extension Education
Agricultural and Resource Economics		Agricultural, Food and Resource Economics	Agricultural Economics	Agricultural Economics	Agricultural and Resource Economics	Agriculture and Applied Economics
Animal Science	Animal Science	Animal Science	Animal Sciences	Animal Science	Animal Science	Animal and Poultry Sciences
Biological and Agricultural Engineering	Biological & Environmental Engineering	Biosystems & Agricultural Engineering	Agricultural & Biological Engineering	Biological and Agricultural Engineering	Biological and Agricultural Engineering	Biological Systems Engineering
Biology						
Crop Science	Crop and Soil Sciences	Crop and Soil Sciences		Soil and Crop Sciences	Plant Sciences*	Crop and Soil Environmental Sciences
Entomology	Entomology	Entomology	Entomology	Entomology		Entomology
Environmental And Molecular Toxicology					Environmental Toxicology	
Food, Bioprocessing and Nutrition Sciences	Food Science	Food Science and Human Nutrition	Food Science	Nutrition and Food Science	Food Science and Technology	Food Science and Technology
Genetics	1) Molecular Biology and Genetics& 2) Plant Breeding and Genetics					
Horticultural Science	Horticulture**	Horticulture	Horticulture & Landscape Architecture		Plant Sciences*	Horticulture
Microbiology	Microbiology			Plant Pathology and Microbiology		
Molecular and Structural Biochemistry			Biochemistry	Biochemistry/Biophysics		Biochemistry
Plant Biology	Plant Biology**				Plant Sciences*	
Plant Pathology	Plant Pathology &Plant-Microbe Biology**	Plant Pathology	Botany & Plant Pathology	Plant Pathology and Microbiology	Plant Pathology	Plant Pathology, Physiology & Weed Science
Poultry Science				Poultry Science		Animal and Poultry Sciences
Soil Science	Crop and Soil Sciences**	Crop and Soil Sciences		Soil and Crop Sciences		Crop and Soil Environmental Sciences
Statistics (Joint with PAMS)		Biological Statistics and Computational Biology				

Table 4-a. Comparison of departmental structure across peer and committee selected aspirational peers for 'Agricultural' colleges.

^Aspirational peer, *combined departments of Crop and Ecosystem Sciences, Horticultural Sciences, & Agricultural Plant Biology, **departments that potentially will be impacted by restructuring.

NCSU	Cornell^	Michigan State	Purdue	Texas A&M	UC Davis	Virginia Tech
College of Agriculture and Life Sciences	*College of Agriculture and Life Sciences*	*College of Agriculture and Natural Resources*	*College of Agriculture*	*College of Agriculture and Life Sciences*	*College of Agricultural and Environmental Sciences*	*College of Agriculture and Life Sciences*
Other Departments not in NCSU CALS	Communication Developmental Sociology Earth and Atmospheric Sciences Ecology and Evolutionary Biology Education Landscape Architecture Natural Resources Nutritional Sciences	Community, Agriculture, Recreation and Resource Studies Fisheries and Wildlife Forestry	Agronomy Forestry & Natural Resources	Ecosystem Science and Management Recreation, Park and Tourism Sciences Wildlife and Fisheries Sciences	Environmental Design and Landscape Architecture Environmental Science and Policy Human and Community Development Land, Air and Water Resources Nematology Nutrition Textiles and Clothing Viticulture and Enology Wildlife, Fish and Community Development	Dairy Science Human Nutrition, Foods and Exercise

Table 4-b. Other departments not in NCSU CALS across peer and committee selected aspirational peers for 'Agricultural' colleges.

^Aspiration peer

NCSU	Cornell^	Michigan State	Purdue	Texas A&M	UC Davis	Virginia Tech
Location of Biology	Location of Biology					
College of Agriculture and Life Sciences	*College of Arts and Sciences*	*College of Natural Science*	*College of Science*	*College of Science*	*College of Biological Sciences*	*College of Science*
Biology Departments	Biology Departments					
Biology Environmental & Molecular Toxicology Genetics Microbiology Molecular and Structural Biochemistry Plant Biology	Chemistry & Chemical Biology Ecology & Evolutionary Biology Molecular Biology & Genetics Neurobiology & Behavior *College of Human Ecology* Biology and Society Human Biology Health and Society	Biochemistry & Molecular Biology Plant Biology	Biological Sciences	Biology	Evolution and Ecology Molecular and Cellular Biology Microbiology Neurobiology, Physiology and Behavior Plant Biology	Biological Sciences

Table 5. Location of 'Biology' departments for 'Agricultural' colleges comparison group.

^ Aspirational peer

NCSU	Colorado State	Iowa State	Ohio State	Penn State	Rutgers - New Brunswick	Univ. of Arizona	Univ. of Florida	Univ. Of Illinois - Urbana/Champaign	Univ. of Maryland - College Park
College of Agricultures and Life Sciences Biology Environmental & Molecular Toxicology Genetics Microbiology Molecular & Structural Biochemistry Plant Biology	*Agricultural Sciences* Bioagricultural Sciences and Pest Management	*Agriculture and Life Sciences* Biochemistry, Biophysics & Molecular Biology Ecology, Evolution & Organismal Biology Genetics, Development & Cell Biology Plant Pathology& Microbiology	*Food, Agriculture and Environmental Sciences*	*Agricultural Sciences* Veterinary & Biomedical Sciences	*College of Environmental and Biological Sciences* Biochemistry &Microbiology Ecology, Evolution & Natural Resources Plant Biology and Pathology	*Agriculture and Life Sciences* Veterinary Sciences &Microbiology	*Agricultural and Life Sciences* Biology* Microbiology & Cell Science Plant Molecular & Cellular Biology	*Agricultural, Consumer and Environmental Sciences*	*Agriculture and Natural Resources* Veterinary Medicine
OTHER colleges with biological sciences	*College of Natural Sciences* Biochemistry Biology	*College of Liberal Arts and Sciences* Biochemistry, Biophysics & Molecular Biology* Ecology, Evolution & Organismal Biology* Genetics, Development & Cell Biology* *cross college	*College of Arts and Sciences* Biochemistry Evolution, Ecology & Organismal Biology Microbiology	*College of Science* Biochemistry & Molecular Biology Biology	*College of Arts and Sciences* :Biological Sciences & Division of Life Sciences Cell Biology Neuroscience, Genetics Molecular Biology and Biochemistry Biological Chemistry* Behavioral Neuroscience* *Sections	*College of Science* Chemistry and Biochemistry Ecology and Evolutionary Biology Molecular and Cellular Biology	*College of Arts and Sciences* Biology* *cross college relationship is not clear from the website	*College of Liberal Arts and Sciences* Biochemistry Cell and Developmental Biology Ecology, Evolution, and Conservation Biology Microbiology Plant Biology School of Integrative Biology School of Molecular and Cellular Biology	*College of Computer, Mathematical and Natural Sciences* Biology Cell Biology & Molecular Genetics Chemistry and Biochemistry

Table 6. Location of 'Biology' departments for official peers not otherwise represented above.

(see Table 7: Wisconsin and Georgia Tech and Table 5: Purdue, Michigan, Texas A&M and Virginia Tech)

NCSU	Cornell^	Georgia Tech	Texas A&M	Penn State	UC San Diego^	Univ. of Minnesota^	Univ. of Washington^	Univ. of Wisconsin - Madison
College of Physical and Mathematical Sciences	*College of Arts & Sciences(Physical/Natural Sciences)*	*College of Sciences*	*College of Science*	*Eberly College of Science*	*Division* of Physical Science*	*Science & Engineering*	*College of Arts & Sciences (list includes Natural Sciences)*	*College of Letters & Sciences(list includes 'science depts.')*
Departments in PAMS	Similar/Equivalent Departments							
Chemistry	Chemistry& Chemical Biology	Chemistry & Biochemistry	Chemistry	Chemistry	Chemistry and Biochemistry	Chemistry	Chemistry	Chemistry
Marine, Earth and Atmospheric Sciences		Earth & Atmospheric Sciences				Earth Sciences		1) Atmospheric and Oceanic Sciences and 2) Geoscience
Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	Mathematics	1) Applied Mathematics and 2) Mathematics	Mathematics
Physics	Physics	Physics	Physics & Astronomy	Physics	Physics	Physics and Astronomy	Physics	Physics
Statistics	Statistical Science		Statistics	Statistics		Statistics	Statistics	Statistics
Other units not in NCSU PAMS and the identification of where Marine, Earth and Atmospheric Science like departments are located	Other Academic Units							
	Astronomy Ecology & Evolutionary Biology Molecular Biology & Genetics Neurobiology & Behavior *In addition, in the College of Engineering* Earth and Atmospheric Sciences	Applied Physiology Biology Psychology	Biology *In addition, in the College of Geosciences* Atmospheric Sciences Geography Geology and Geophysics Oceanography	Astronomy & Astrophysics Biochemistry & Molecular Biology Biology Forensic Science *In addition, in the College of Earth and Mineral Sciences* Geosciences Meteorology	*In addition, in the Division* of Biological Sciences* Cell and Developmental Biology Ecology, Behavior and Evolution Molecular Biology Neurobiology and *Scripps Institution of Oceanography* (mission includes ocean, atmospheric and earth science) **Divisions report to the Executive Vice Chancellor for Academic Affairs*	*In addition, in the College of Biological Sciences* Biochemistry, Molecular Biology, and Biophysics Ecology, Evolution and Behavior Genetics, Cell Biology and Development Plant Biology Microbiology Neuroscience	Astronomy Biology Psychology Speech and Hearing Sciences *In addition, in the College of the Environment* Atmospheric Sciences and Earth & Space Sciences, Aquatic and Fisheries Sciences, Environmental and Forest Sciences, Marine and Environmental Affairs and Oceanography	Astronomy Botany Computer Sciences Psychology Zoology *In addition, an Institute for Biology Education is administered by the Provost's Office*

Table 7. Comparison of departmental structure across peer and committee selected aspirational peers for 'Science' colleges.

^ Aspirational peer

NCSU	Colorado State	Oregon State^	SUNY-ESF/Syracuse^	Univ. of Washington^	Virginia Tech
College of Natural Resources	*College of Natural Resources*	*College of Forestry*	*College of Environmental Science and Forestry*	*College of the Environment*	*College of Natural Resources and Environment*
Departments in CNR	Similar/Equivalent Departments				
Forest Biomaterials		Wood Science and Engineering	Paper & Bioprocessing Engineering		Wood Science and Forest Products
Forestry and Environmental Resources	1) Fish, Wildlife and Conservation Biology and 2) Forest, Rangeland and Watershed Stewardship	Forest Engineering, Resources and Management	Forest and Natural Resources Management	Environmental and Forest Sciences	Forest Resources and Environmental Conservation
Parks, Recreation and Tourism Management	Human Dimensions of Natural Resources	Forest Ecosystems and Society			
Other Departments not in NCSU CNR	Other Departments				
	Ecosystem Science and Sustainability Geosciences		Chemistry Environmental and Forest Biology Environmental Resources Engineering Environmental Studies Landscape Architecture Sustainable Construction Management & Engineering Division of Environmental Sciences	Aquatic and Fisheries Science Atmospheric Sciences Earth and Space Sciences Marine and Environmental Affairs Oceanography	Fish and Wildlife Conservation Geography

Table 8. Comparison of departmental structure across peer and committee selected aspirational peers for 'Natural Resource' colleges.

^ Aspirational peer