5+ year review

Janice L. Nerger, Dean
College of Natural Sciences

Nov. 2, 2015
• 186 regular faculty (up from 172)
• 34 special faculty; 320 GTAs
• 4246 Undergraduate Primary Majors
• 633 Graduate Students

• 750 BS; 146 MS; 67 PhD annually
• 161K Undergraduate SCH annually
• Provide 700+ sections of AUCC

• RI budget ~ $30M
• External funding ~ $33M
• $3.7M indirect costs
February 2010
What do these two plays have in common?

from 'Antigone' by Sophocles

Don’t shoot the messenger!
BUDGET CUTS !!!

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Percentage Cut</th>
<th>Reduction Amount</th>
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</thead>
<tbody>
<tr>
<td>FY09</td>
<td>-2.78%</td>
<td>$ -715,000</td>
</tr>
<tr>
<td>FY10</td>
<td>-2.67%</td>
<td>$ -540,000</td>
</tr>
<tr>
<td>FY11</td>
<td>-3.66%</td>
<td>$ -900,000</td>
</tr>
<tr>
<td>FY12</td>
<td>-5.33%</td>
<td>$ -1,300,000</td>
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Total Budget Reduction: $ -3,455,000
BUDGET CUTS … 97% of budget in salaries

Primary cuts via:
• open positions
• graduate programs
E&G (1-3) BUDGET: since FY09

+19% since FY09

Differential Tuition & Enrollment Growth funds partially based
Research Expenditures (5-3) vs. E&G (1-3)
Research

Current Strengths:
• Healthy growth in external funding
• Funding broad-based
• All pre-tenure faculty w/ funding or proposal submitted
• Avg. research spending/faculty member = ~$200K/year

Strategies:
• Course reduction for large proposals
• Travel support
• Close coordination with OSP team
• Strategic Hiring
GRADUATE PROGRAMS

MS and PhD in all 8 departments

All departments in top 100 of US News & World Report 2015 graduate program rankings.

Fall 2015: 633 = +9%

Bio 75
Chem 49
CS 70
Math 73
PH 70
Stat 42
Undergraduate Programs

- Prepare the next generation of scientists and entrepreneurs
- Provide foundational mathematics and science instruction for all majors

Current Strengths:
- Two of the five largest majors on campus
- Strong commitment to undergraduate programs in all departments
- Cost effective delivery of AUCC courses
- Aggressively addressing wait lists and courses with high DFW rates

Strategies:
- Residential Learning Community (tutoring/clubs/career counseling)
- 50/50 Academic Support Coordinators/Instructors
- Expand online and hybrid courses
- Novel interdisciplinary programs, e.g. Neuroscience, CAC, Chem/Bio
UNDERGRADUATE PROGRAMS

1. Biochem & Molecular Biology
2. Biology
3. Chemistry
4. Computer Science
5. Mathematics
6. Physics
7. Psychology
8. Statistics

12 majors: BS in all departments + Zoology, Applied Computing Technology, Natural Sciences, Neuroscience (with CVMBS)

Fall 2015: 4246 = +24%
UNDERGRADUATE TEACHING

AY14/15: 161,000 SCH

Challenge: high AUCC and Service teaching load

Service Teaching: 61% of our SCH are to non-CNS majors

• Enrollment Growth dollars (AUCC)
• Differential tuition collected on 43% of SCH

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>% SCH w/ DT</th>
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<tr>
<td></td>
<td>AY14/15</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td></td>
<td>46860</td>
</tr>
<tr>
<td>Sophomore</td>
<td></td>
<td>45095</td>
</tr>
<tr>
<td>Junior</td>
<td></td>
<td>34725</td>
</tr>
<tr>
<td>Senior</td>
<td></td>
<td>34109</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>160789</td>
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</table>

CAS 58%
CoB 95%
CLA 46%
CoE 74%
CHHS 69%
CNS 43%
CVMBS 75%
WCNR 64%
STUDENT SUCCESS INITIATIVES - highlights

- Learning Community (Laurel Village)
- CLeRC (Chemistry Learning Resource Center) in Yates
- Women in Physics
- Calculus Center
- Problem Solving in General Chemistry
More highlights

New Degree Programs

**Undergraduate Degrees:** (3)
- BS Statistics (first cohort Fall 2014; N=52)
- BS Neuroscience (with CVMBS; first cohort Fall 2014; N=91)
- BS Data Science (in progress)

**Graduate Degrees:** (5)
- MS in Natural Sciences Education
- MS in Applied Statistics
- PSM (Professional Science Masters)
  - Zoo, Aquarium, and Animal Shelter Management
  - Certified Addictions Counseling (Fall 2016)
  - Quantitative Biology (in progress)
Differential Tuition

Total dollars: ~$3.6M

- Backfill budget cuts
- One-time expenditures e.g. classrooms renovations, UG meeting space; Women in Physics office
- GTAs
- Instructors; Academic Support Coordinators
- Faculty hiring

Current rate = $65/SCH
STRATEGIC HIRING

Rationale:
• Synergy of collaborative groups in selected areas

Current Strengths:
• Strong multi-disciplinary programs, many across college lines

Target:
• Attract top talent into programs in selected areas

Areas of Focus: (identified via College leadership team)
   ✷ Bioinformatics
   ✷ Big Data
   ✷ Materials science
   ✷ STEM education
   ✷ Neuroscience

Strategy:
• Use of differential-tuition (0.5 FTE lines)
Strategic Hiring Results (N=12 + 3)

**Big Data/Bioinformatics**
- **Biology:** Tai Montgomery
- **Computer Science:** Sangmi Pallickara, Hamid Chitsaz
- **Statistics:** Wen Zhou
- **Math:** Henry Adams

**Neuroscience**
- **Psychology:** Don Rojas
Strategic Hiring

**Materials Science**

David Aristoff  
Mathematics

James Neilsen  
Chemistry

Jose de la Venta  
Physics

**STEM Education**

Meena Balgopal  
Biology

Mary Pilgrim  
Mathematics

Jessica Ellis
Strategic Hiring – collateral gains

Materials Science
Clayton Shonkwiler
Mathematics

Big Data
Amit Patel (Fall 2016)
Mathematics

Quantum Magnetism
Kate Ross
Physics
OUTREACH/ENGAGEMENT

Current Strengths:

• EOC; Little Shop of Physics
• Chem Club; Math Day
• Student Clubs in each department
• Research Experiences for Undergraduates (REU) programs
• Contributions to CSU STEM Center
• Masters of NS Education (degree for in-service teachers)
• CO Science & Engineering Fair
• International collaborations (China, Russia, Tasmania, Ireland)
**LITTLE SHOP OF PHYSICS**

Traveling hands-on science education program

Face-to-face with 39,000 individuals in Colorado and throughout the Interior West every year

- K-12 school programs (28,000)
- teacher workshops (500)
- Annual open house (10,000)
- 9 News Weather & Science Day at the Rockies

**EDUCATION & OUTREACH CENTER**

Programming for:
- K-12 teachers
- Science Kits
- STEM Educators Club
- STEM Fridays
- Triumfo Mentoring Program
- CSU faculty
- Sigma XI Chapter Office
- CO Science & Engineering Fair
- Summer Camps
Diversity Initiatives

- Established Director of Inclusion position
- New parental leave guidelines
- Created first bilingual publications for undergraduate recruitment
- Re-established Women in Natural Sciences (WINS) and secured endowment
- New: Women in Physics
- New: O-STEM (national society dedicated to educating and fostering leadership for LGBTQA communities)
- Established CNS Learning Community
Diversity Initiatives – next steps

- Establish a CNS Office of Inclusion

  New Position: Educational Diversity Researcher

  • Support writing education research proposals
  • Develop and maintain clearinghouse of STEM higher education resources
  • Conduct research on CNS population and climate

- Increase efforts to diversify faculty and student body

- Increase International Programs & Cooperations
International Efforts

New Program:

Visiting International Scholars Summer Program
So far, supported 11 visitors across all departments

New Partnerships with:

Saratov State University - dual degree program in Masters in Organizational Psychology

University of Limerick - student exchange program
Guangzhou, China
October 2015

Joint International Laboratory for the Study of the Mind and Brain
Fundraising

Endowment value: $15.5M (from $8.8M)

Number of endowments: 68 to 110
Scholarships: 56 to 94

Current in 15/16: $2.6M
Campaign Progress: $25M
Goal: $60M by 2020

Investments in personnel: +0.75 Coordinator
Infrastructure

Rationale:
• Both research growth and University expansion plans mandate competitive infrastructure

Current Strengths:
• Ability to manage facilities spread over many parts of campus
• Strategic upgrades to current space
• College coordination of IT and research support

Target:
• Research opportunities and course capacities not constrained by infrastructure

Strategies:
• Implement building plans for Biology and Chemistry
• Solve immediate space problems in Biochemistry, Physics, Psychology
• Work with University to incorporate effective space reallocation into expansion plans
• Document space utilization of CNS at the individual room level
Infrastructure

- **Mathematics**
  graduate student office suite; created new faculty offices
  Post-doctoral office space; Calculus Center
- **Statistics**
  post-doc space; graduate student lounge; Graybill Statistics Lab
- **Biochemistry**
  Lab & classroom renovations; moved main office to first floor
- **Physics**
  flipped classrooms; new UG lab classroom; UG majors space
- **Psychology** – new EEG research facility
- **Chemistry** – entry & lobby area; large classrooms; CH Advising Learning Resource Center
- **Biology** – various lab and classroom upgrades
- **NESB** – relocated LSOP, now co-located EOC, STEM Center

- Lab renovations with faculty hires
SUCCESS STORIES: Laurel Village
SUCCESS STORIES: Academic Bldgs

Chemistry Research

Biology
Guided by our STRATEGIC PLAN

“CNS 2020”

• Student Success
• Research Excellence
• Faculty & Staff
• External Engagement
• Continuous Improvement
Five Strategic Values: Major Accomplishments

1. **Student Success**
   - Overall growth
   - Reduced waitlists
   - Laurel Village & CNS Learning Community
   - Substantially reduced waitlists in AUCC courses
   - $250,000 establish the Calculus Center
   - $150,000 Problem Solving in General Chemistry
   - Added two new majors; 3rd in progress; 5 new Grad degrees
   - Professional Science Master’s Degrees

2. **Faculty & Staff**
   - 14 new TT positions
   - 8 new NTTF positions
   - Formed committee of NTTF
   - ~30 additional GTAs
3. Research Excellence

- Strategic cluster hiring
- Support Interdisciplinary Centers & activities
- Increase research expenditures
- All pre-tenure faculty funded or proposal under review

4. External Engagement & STEM

- Added Science Education faculty to Math and Biology
- Increase number students receiving teaching certification
- Engaged with University STEM Center
- Well-developed and coordinated outreach programs
  - Education & Outreach Center
  - Little Shop of Physics
Five Strategic Values

5. Continuous Improvement

- Strategic plans with hiring plans for all departments
- Integrated use of FAS and University assessment
- Faculty workload distributions
- Centralized IT support
- Improved Infrastructure (renovations & new facilities)
- Fundraising up significantly
WHAT’S NEXT?

- Maximize student learning and success
- Promote science and mathematics literacy
- Maximize recruitment and retention of faculty to advance student success and signature areas of research distinction
- Grow graduate student body including support for stipend, tuition, benefits
- Use the University and College Strategic Plans as a guide to current and future opportunities.
REFRESH OUR STRATEGIC PLAN

No major course correction

Diversify the faculty
• Continue supporting targeted growth in core disciplines and emerging interdisciplinary fields, e.g. Neurosciences, Data Science, Materials Science

Strengthen and stabilize the NTTF
• Articulate clear hiring, performance evaluation, career advancement and rewards for these faculty members

Students:
• Increase financial support for recruiting best graduate students
• Expand undergraduate curriculum – interdisciplinary programs; undergraduate research

Create CNS Office of Inclusion

Fundraising efforts will necessarily increase
Our Values Remain Unchanged:

- Prepare the next generation of scientists and educated citizens
- Promote discovery and innovation
- Create impact
Groundbreaking Ceremony

October 15, 2015