Summary of IGEP Third Year Review reporting data
Compiled October 2014 for the period of fall 2011 through spring 2014

Four Interdisciplinary Graduate Education Programs (IGEPs) were funded in 2011, comprising the first cohort:

- **Multi-Scale Transport in Environmental and Physiological Systems (MultiSTEPS)** (PI- Mark Stremler)
- **Sustainable Nanotechnology (SuN)** (PI- Peter Vikesland)
- **Translational Plant Science (TPS)** (PI- John McDowell)
- **Water Interface (WATER)** (PI- Brenda Davy)

This report summarizes the outcome of the first 3rd year review of this first co-hort. IGEPs will continue to be reviewed every 3 years (3rd year review, 6th year review, etc.). Table 1 summarizes some of the quantitative measures of success in the first cohort of IGEPs:

<table>
<thead>
<tr>
<th></th>
<th>New VT doctoral students</th>
<th>Other affiliated students</th>
<th>Journal publications</th>
<th>Conference presentations</th>
<th>Number of external grants</th>
<th>Total external funding</th>
<th>Number of faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>MultiSTEPS</td>
<td>26</td>
<td>12</td>
<td>19</td>
<td>41</td>
<td>21</td>
<td>$11.4M</td>
<td>20</td>
</tr>
<tr>
<td>SuN</td>
<td>9</td>
<td>14</td>
<td>29</td>
<td>39</td>
<td>4</td>
<td>$2.7M</td>
<td>10</td>
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<tr>
<td>TPS</td>
<td>17</td>
<td>27</td>
<td>74</td>
<td>91</td>
<td>51</td>
<td>$44.7M</td>
<td>24</td>
</tr>
<tr>
<td>WATER</td>
<td>14</td>
<td>8</td>
<td>48</td>
<td>87</td>
<td>19</td>
<td>$6.6M</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>66</strong></td>
<td><strong>61</strong></td>
<td><strong>170</strong></td>
<td><strong>250</strong></td>
<td><strong>95</strong></td>
<td><strong>$65.4M</strong></td>
<td><strong>66</strong></td>
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</tbody>
</table>

All four IGEPs were extended an additional three years of funding at the time of review.

The following sections summarize some common themes noted across the reviews.

**Institutional Support**

In general, the IGEP programs are steadily gaining in participation of faculty, with buy-in from department heads and success in recruiting students with credit both to IGEP and home department. The value of the program is being communicated and understood by administrators. Some IGEPs, such as Multi-Steps, benefit from existing infrastructure from an NSF IGERT. Others with entirely new topics and groups of faculty, such as SuN, are earlier on the curve, but gaining ground.

**GRAD 5134 and Other IGEP Courses**

GRAD 5134 successfully implemented and taught by all four IGEPs. Water and SuN have teamed together, along with the obesity IGEP, in teaching their 5134 course. Teaching load recognition is still a challenge for some IGEP faculty. Faculty can be reluctant to commit to teaching. Some IGEPs use the 10K allocation for partial buy-out. A more formal buyout policy, i.e., negotiating half a course buyout, was up for discussion.
Certificates and Leveraging with other Interdisciplinary Graduate Programs

A graduate certificate in Water was approved and now being pursued by Water Interface IGEP students. SuN has completed the certificate paperwork and plans to submit as soon as CEE 5114 is approved. Both Translational Plant Sciences and MultiSTEPS plan to get to work on a grad certificate in the coming year. MultiSTEPS has 2 more years of NSF IGERT funding, including a one-year no-cost extension. This will call for a corresponding refinement of objectives and vision. IGEPs continue to seek to leverage for external funding, such as NSF NRT and NSF PIRE.

Program Size and Student Tracking

In general, the need to communicate with department heads, graduate program directors, and program coordinators about tracking of students during admission and in Banner majors was noted. Since the time of the completion of the 3rd review, Banner has been re-vamped and the IGEP majors coded in such that home departments will be the primary major and IGEP will be the secondary major. This should help directly address tracking problems and concerns from departments. The application system is similarly being updated so that when students directly apply to the IGEP of their choice, they can select from up to three home departments for review. These applications will be visible directly in GS APPs by all designated IGEP faculty, as well as the home departments. This should avoid problems that some have cited with staff spending excessive time downloading applications and posting to Scholar for IGEP faculty to review. Most IGEPs felt they were about at steady-state in terms of faculty and student participation, while SuN expressed that it is still in a growth phase.

Staffing

IGEPs vary in their approaches to staffing. TPS has a Grants Coordinator that they hired to assist with financials and another staff member to assist with applications. MultiSTEPS has built on available staff support from their IGERT. SuN is teamed with the ICTAS SuN Center in supporting a staff member to coordinate events and meetings, but felt they would benefit from an actual part-time program coordinator. Water has mainly relied on its faculty members to carry the load and this has been challenging.
Public Report

Summary of IGEP Third Year Reviews conducted in Summer 2014

In July 2014, Dean DePauw met with faculty leaders from the four IGEPs funded in 2011 to discuss third year reports they submitted in June. The programs generally met their goals of recruiting PhD students, publishing, grant writing, curriculum and outreach. All four programs will receive continued funding. They should expect to continue to submit annual reports and to have their next review in three more years (2017).

Collectively, with 66 affiliated faculty, the first four IGEPs recruited 66 new doctoral students to Virginia Tech, worked with 61 other affiliated students, published 170 articles, made 250 conference presentations, and secured 95 grants for over $65 million.

The IGEPs are very diverse in terms of development of the community, collaborations, and topic area. Some programs have used the three years to develop their ideas of what their topic encompasses in an ever-changing research and policy environment. Others had a strong foundation of prior collaboration upon which they have built. For all four programs, this was a good time to refine their focus and reconsider which faculty are most engaged and who bring the appropriate expertise. Some are planning to expand by recruiting new faculty to IGEP.

Several IGEPs are working on developing graduate certificates based on their training programs. This will help define the community and allow more students to access interdisciplinary graduate training.

Innovative practices

- IGEP students are taking on leadership roles in blogging, planning events (seminars, symposia), inviting guest speakers, and even annual budgeting for IGEP activities.
- Translational Plant Science is structured around first year is lab rotations during which students identify an advisor and a lab; this process facilitates a lot of coadvising.
- Research rotations also worked well for MultiSTEPS for a variety of reasons. In particular, students put peer pressure on each other to prepare for presentations about their rotations.
- Lab rotations in multiple programs seem to support a sense of community (if shared expectations for what students will get out of rotations). The list of faculty available for rotations (and annual updates) can also be a good mechanism for tracking who is actively involved in the program.
- Water INTERface is doing a great job with blogging. Some of their specific strategies include assigning students on a rotation to post to the blog and blogging about interviews with students, faculty and alumni.
- Sustainable Nanotechnology and Water INTERface reported on additional metrics around communicating science such as webpages, blogs, Facebook, Twitter, community outreach events, service projects and media appearances.
MultiSTEPS is experimenting with their introductory required courses by allowing students with strong foundational knowledge to complete course requirements by assisting with teaching students for whom the material is less familiar.

GRAD 5134 has been taught jointly between Sustainable Nanotechnology, Water INTERface and Translational Obesity Research. Their feedback to other IGEPs considering this is that you need similar topics for it to work, and that they felt student projects worked better with teams mixed across IGEPs.

Recruiting

Translational Plant Science hosts a fall event and a spring recruiting event during which different prospective students visit VT. The fall event is key to getting students excited about VT early and comparing all other options to VT’s program. The spring event is coupled with their symposium which features external speakers and IGEP student posters.

Other IGEPs tend to recruit through department and faculty contacts. MultiSTEPS noted that most successful recruits are attracted to a particular faculty member and project.

Dannette Beane, Director of Recruitment and Diversity Initiatives in the Graduate School, will contact all IGEP leads for individual meetings about recruiting.

Certificates

Certificates can potentially open up access to more students and create a clearer list of who is pursuing interdisciplinary training.

Many IGEPs are working on graduate certificates of approximately 9-12 credits.

The approval process for certificates is much simpler than for degree programs.

There is a two-step process for students to (1) apply for a certificate (this helps us track who is working toward the certificate) and (2) request conferral after coursework is completed. Certificates can be awarded before graduation, but students are assessed a $25 conferral fee.

Feedback for Graduate School

IGEP leads are on the Grad Program Directors email list, but they don’t always know what’s relevant to them and what is not. Important information should be reinforced by the Associate Dean and Director for Interdisciplinary Programs.

Get IGEP faculty together for brownbags to discuss what works. Example topics: 5134 class, communicating value to administrators, empowering students to take on leadership roles, staffing and administrative support, recruiting.

Need better communication with students, department chairs, and department graduate staff about first and second majors to track IGEP students.

VT People Search is another system that needs to list graduate students’ first AND second majors.

Need to understand and explain “dual tracking” in application system better for IGEP faculty and their departments.
• Water requested a photo shoot for IGEP-specific photos of students and faculty in action.
• All programs were encouraged to track alumni on LinkedIn. David Schmale (TPS) is taking the lead on looking into groups. Prime students while they are here to stay in touch through LinkedIn.
• Teaching credit, buyouts and teaching loads remain a challenge for staffing IGEP courses including GRAD 5134.
• We discussed support staff. Some IGEPs have found part-time staff to meet their program coordinator-type needs. Others would like more help from the Graduate School.