DELTA CAPSTONE

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DELTA

Developing Energy Leaders Through Action
• Funded by North Carolina State Energy Office
• Administered by Institute for the Environment

Capstone role: observe & report on the achievements of the 12 DELTA interns’ energy-related projects
• Reports and surveys
• Develop a monitoring framework
• Energy savings, greenhouse gas emissions reductions, and renewable energy production
SPRING 2011 DELTA INTERNS

UNC Wind Study
RTI (Research Triangle Institute)
UNC Energy Management
Progress Energy
Piedmont Biofuels
UNC Institute for the Environment
UNC Environmental Finance Center
Town of Chapel Hill
DELTA INTERNSHIP THEMES

Renewable energy

Management/organization existing and new projects

Finances

Conservation

Building efficiency

Education

On- and off-campus projects

Feasibility studies
GETTING STARTED

Client meeting
Document review

- Fall 2010 capstone
- SEO quarterly reporting questions
- Intern workplans

<table>
<thead>
<tr>
<th>Review existing documents</th>
<th>Introductory meetings</th>
<th>Mid-semester</th>
<th>Data analysis</th>
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</thead>
<tbody>
<tr>
<td>Meet client</td>
<td>Draft new documents</td>
<td>SEO I</td>
<td>SEO II and End-of-Semester</td>
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</tbody>
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METHODS

- Met with interns
- SEO I
- Qualtrics
- Mid-semester
- SEO II
- End-of-semester
RESULTS: SEO

UNC Energy Management
361 Safe-T Element installations *estimates* savings:

<table>
<thead>
<tr>
<th></th>
<th>Annual Energy Cost</th>
<th>Electricity (kWh)</th>
<th>CO2 emissions (Kg)</th>
<th>Payback period</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNC Energy Management</td>
<td>$16,752.66</td>
<td>268,043</td>
<td>125,980</td>
<td>7.2 yrs</td>
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RESULTS: SEO

UNC Environmental Finance Center
RESPC Revolving Fund estimates:
- $150,000 investment with a $600,000 savings
- electricity consumption reduction of 2,968MWh
- electricity demand reduction of 0.0169MW
- 20 year payback period

Town of Chapel Hill: 2010 Energy and GHG inventory for municipal operations; $8,051 in avoided annual costs

UNC Wind Study: retrieved in situ data from 13 offshore monitoring stations
OTHER ACTIVITIES

UNC Energy Management

- Undergrads: EPA competition; X-treme Energy Teams
- Graduate: Duke rebate program; life cycle cost analysis; comparison/ranking

Energy Management Team
(Holly Kuestner presentation)
OTHER ACTIVITIES

Piedmont Biofuels: efficient WVO collection routes and database; workshops

Town of Chapel Hill: programmable thermostats; historical data; energy management program

Progress Energy: trainings and organizing for EnergyWise employee transition

Piedmont Biofuels, Naomi Fernando
**RESULTS: IMPACTS**

**RTI:** rethinking possible uses for Brownfield sites; pursuing project with Cherokee Investment Partners

**UNC Energy Management:** efficiency of campus buildings; foster participation from students, faculty, and staff; pursue career in energy field

**UNC Wind Study:** estimating potential power output along NC coast; reinforced interest in environmental engineering

**UNC Finance Center:** student investment leads to energy and carbon savings
RESULTS: SKILLS AND KNOWLEDGE

UNC Energy Management: Life cycle cost analysis, energy efficiency engineering, understanding UNC energy systems

Piedmont Biofuels: management, consulting, data organization, grant administration

Across sites: financial structures, data collection and analysis, problem solving in real world work environment, presenting knowledge to others
RECOMMENDED FRAMEWORK

Clear language
Consistent terminology
Short introductory meeting with the interns
Detailed timeline of SEO reporting dates
Qualtrics
SEO and Qualitative separate from each other
ACKNOWLEDGEMENTS

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DELTA interns and mentors