I. Abstract

Institutional food service organizations looking to “green” their operations confront significant budgetary and logistical roadblocks in the process. Yale Dining, serving 14,000 meals daily, struggles against the adverse climate of New England and the resultant high cost of fresh, local products. In order to facilitate local procurement and reduce Yale Dining’s dependence on nationally distributed food, the Yale Office of Sustainability started building an online food map in the spring of 2010 which, once completed, would offer Yale Dining an intuitive means of accessing local foods. In order to avoid redundancy with other online food maps, small farms would be vetted out of the map so that institutions of Yale’s size could bypass farms too small to contribute meaningful volume. In the process of plotting organic farmers onto a Google map, it became clear that mapping pertinent, up-to-date information on micro-scale farm production would be impossible due to the structure of contract farming and inherent information gathering barriers. Conclusions were drawn as to the most productive modes of collaboration between institutions such as Yale Dining and small farmers.

II. Project Origins

Many logistical and economic barriers to sustainable food purchasing confront institutions of Yale’s size. Yale Dining, at the beginning of the academic
year 2009, committed itself to dramatically increasing the quantity of organic, local and humane food purchased for service in the Yale dining halls. The Yale Office of Sustainability, partially in response to this push, initiated a project with Clean Air Cool Planet (CACP), an environmental consultancy group, to create a carbon calculator as an addition to the Yale Dining meal planning and nutrition software. This calculator would mimic the nutritional calculator already in use, but instead of tabulating calories would calculate the carbon impact of a meal from its component parts. Over the summer of 2009 two Yale students worked to organize and condense Yale Dining’s haphazard spreadsheets into usable data and, beginning in the fall, research assistants at the Office of Sustainability continued this effort. Meetings between CACP, the Office of Sustainability and Yale faculty specializing in LCA analysis highlighted the enormous complexity of such a project. The carbon lifecycle of processed foods and conventional produce is highly sensitive to variables that are often difficult to measure and control. Most likely due to the project’s unpromising prognosis, CACP fell out of communication with the Office and the project stagnated.

Although a carbon calculator would have been an extremely useful and trend setting tool, it would not have addressed another central difficulty of sustainable food purchasing at institutional scales. The path to procuring low-carbon food items is just as difficult, at the institutional scale, as identifying these products in the first place. A new project was developed that would attempt to address the procurement side of the equation: a food map of Northeast farmers willing and of sufficient size to source for Yale Dining.

III. Vision

More fossil fuels are burned in transportation as a food travels farther and farther from farm to plate. This is the concept behind food miles, the generally accepted notion that GHG emissions are higher for foods that travel long distances from dirt to mouth. Although the environmental tradeoffs of local eating and the relevance of food miles in GHG calculations have recently come under increasing scrutiny, our he project’s aim was to help institutions purchase local and sustainable foods by creating a map of the Northeast with 100, 200, and 300-mile radii around New Haven embedded for scale. An institution could then find a farm from the map nearest to them that had already been vetted for both willingness and capacity to sell directly to institutions in a logistically efficient manner. The buyer would be able to see what the farmer produced, in what quantity, and for what price he or she would sell. The food map would thus be a streamlining tool between buyer and seller.
IV. Methodology

The first step in developing a useful online tool for institutional food purchasing was to identify the resources already available for such a purpose. Examining the plethora of websites listing and mapping organic foods and community-supported agriculture was a natural first step.

A. WEBSITES

The CT Grown Farm to Chef Program, which can be found at (http://www.ct.gov/doag/cwp/view.asp?a=2778&q=330830), served as the model website upon which the entire project could ultimately be based. In particular, the resource listing of producers and wholesalers provides most (but not all) of the essential information needed to open a productive dialogue between an institution and a grower/wholesaler. This information includes the location of the farm and the products grown throughout the year. The information presented is reflective of the website’s intended audience: individual consumers and restaurant chefs demand only finite quantities of product. Thus, the quantity grown is inessential information, as chances are that production will far surpass demand from any given consumer. As will be discussed later, such is not the case for an institutional purchaser serving 14,000 meals daily.

Websites similar to, and many more complex than, the CT Grown Farm to Chef site abound. Nearly every Department of Agriculture in the Northeast administers an online resource for organic and local foods, either direct from small farmers or through a farmers’ market. NOFA, the Northeast Organic Farming Association, runs excellent websites in every Northeast state except Maine. The limitations of each website, however, were the same: none provided a distinction between farms that have an operative capacity for institutional sales and those that do not. It is simply not practical for an institution of Yale’s size to purchase 100 lbs of broccoli here, 100 lbs there, and 200 lbs elsewhere to meet the needs of a single all-campus meal. This hang-up was to be avoided by direct outreach to farmers in order to determine their productive capacity. Yale is also conscious that, in a community the size of New Haven, and indeed in a state the size of Connecticut, it is easy for large institutions to dominate the food purchasing landscape in an unhealthy manner.

B. MAPPING

With the farm names and addresses from the CT Grown website in hand, a search was conducted for an online mapping tool capable of plotting names and addresses from an excel spreadsheet onto a Google map. After about half an hour the website Map a List (mapalist.com) was discovered. Not only was the
mapping tool free, it was extremely intuitive. Addresses and farmers were entered into a spreadsheet in the manner below:

<table>
<thead>
<tr>
<th>ADDRESS</th>
<th>CITY</th>
<th>STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 Platts Hill Road, P.O. Box 244</td>
<td>newton</td>
<td>ct</td>
</tr>
<tr>
<td>4 Robin Hill</td>
<td>newton</td>
<td>ct</td>
</tr>
<tr>
<td>606 Walnut Tree Hill Road</td>
<td>shelton</td>
<td>ct</td>
</tr>
<tr>
<td>180 Millstone Rd</td>
<td>wilton</td>
<td>ct</td>
</tr>
<tr>
<td>Sargent's Cove, 132 Water Street</td>
<td>norwalk</td>
<td>ct</td>
</tr>
<tr>
<td>7 Edgewater Place</td>
<td>norwalk</td>
<td>ct</td>
</tr>
<tr>
<td>77 Lyons Plain Road</td>
<td>weston</td>
<td>ct</td>
</tr>
<tr>
<td>83 Toddy Hill Road</td>
<td>sandy hook</td>
<td>ct</td>
</tr>
<tr>
<td>596 Sport Hill Road</td>
<td>easton</td>
<td>ct</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NAME</th>
<th>WHOLESALE</th>
<th>AG (v. DAIRY...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherry Grove Farm, LLC</td>
<td>ag</td>
<td>y</td>
</tr>
<tr>
<td>Ferris Acres Creamery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones Family Farms</td>
<td>ag</td>
<td>y</td>
</tr>
<tr>
<td>Millstone Farm</td>
<td>wholesale</td>
<td>y</td>
</tr>
<tr>
<td>Ned's Island Oysters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norm Bloom and Son LLC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Bee Apiary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sepe Farm</td>
<td>ag</td>
<td>y</td>
</tr>
<tr>
<td>Sport Hill Farm</td>
<td>ag</td>
<td>y</td>
</tr>
</tbody>
</table>

*Map a List automatically plots this data onto a Google map - the map was customized with different pins identifying farms that were primarily agricultural,*
primarily livestock/specialty foods, and wholesale operations. The map in its infant stages can be accessed here:

http://mapalist.com/Public/PublicMapViewerShell.aspx?mapid=73379

It is not possible, however, to overlay county divisions onto this map or to draw the 100, 200, and 300-mile radii lines using the Map a List tool. ArcGIS - a very well known, but also expensive and functionally complex mapping system - could have accommodated these features.

C. REDUNDANCY AVOIDANCE

As alluded to in the “A” methodology section, many if not most farmers listed on websites provided by Departments of Agriculture and organic farming groups are too small to contract with Yale Dining in a logistically efficient manner. Indeed, many of the farm lists are actually maps and compendiums of farmers’ markets, farm stands and CSA drop locations. These operations present the same problem, as Yale Dining demands vastly more product than can be adequately and efficiently serviced by small farmers at a farm stand. Moreover, many of these producers have a business model that centers on low-volume, high premium direct sales and would not be able to sell at or near Yale dining’s price points. The essential task for this project became “vetting” the smallest producers out of the institutional food map by either: a. finding a list of farms with productive capacity listed or b. contacting farmers directly and gathering this information through a survey. Searching for this crucial information occupied the bulk of the project’s time - ultimately, for reasons to be elaborated later, productive capacity is extremely difficult to gather and disseminate.

D. CAPACITY, THE SEARCH FOR FEASIBILITY

The USDA mandates that all growers submit “farm plans” each year, detailing planted acreage, acreage owned, and products in production. Using this information, our project aimed to purge the sub 5-acre farms from our map and thereby save institutional dining services the hassle of doing so themselves. Unfortunately, farm plans are not made available to the public - permission of the farm is required. Although it was hoped that the farm-to-chef, organic and farmers’ market websites would provide some of this information, none of them did. Many farm lists present potential production, or in some cases the crop scheme from the previous growing season, but none offer a farm’s productive capacity. Because so many farm maps already exist, the need to include only moderate to large capacity organic and IPM farms on the institutional food map was reiterated.

After the project began the USDA released its first ever national survey or organic agriculture. The data, accessible to anyone from the USDA website, is an exceptionally useful tool for state-to-state comparisons of organic production.
However, bound by the same regulations that maintain farm plans off the public record, the survey is extremely vague with regard to small state production of specialty produce. Not only is farm-level data not presented, county level data is also absent - an inquiry with the National Agricultural Statistics Service revealed that such county level data would not be made available to anyone.

E. OUTREACH

A farmer survey was created in order to surmount the many hurdles to information gathering in place. The questions ranged from productive capacity to willingness to work closely with institutional purchasers. The Yale Sustainable Food Project, a strategic partner in many of the food-related initiatives at the Office of Sustainability, is in the process of administering a particularly thorough survey to Connecticut farmers whom they have worked with or have been in contact with in the past. The Yale Dining Forager Coordinator developed a compact survey designed specifically to determine the ability and willingness of growers to work with large purchasers such as Yale Dining. The survey is pasted below:

Yale Dining Services
YSEC Farm Survey 2010
DRAFT SUBJECT TO CHANGE

1. Business Name:
   Primary Contact:
   Phone:
   Email:
   Website:
   Physical Address:

2. How many acres does your farm regularly have in production? [#]
   Do you have the capacity to farm additional acreage? [Y/N]

3. What products does your farm produce? [list]
   Are any of these products a specialty or the bulk of your business? [Y/N, if yes describe]
4. What are your growing methods? [conventional, certified organic, IPM, transitional, other certification]

5. Do you currently sell to wholesale distributors? [Y/N]
   Direct to Institutions? (hospitals, schools, etc.) [Y/N]

6. Does your farm practice season extension techniques? [choose: heated greenhouse, passive hoop house/walk-in tunnel, row covers, root cellar, other]
   Would you be interested in attending an educational workshop on season extension? [Y/N]

7. Do you have any standing relationships with local co-packers/processors that use your products to produce canned or frozen goods? [Y/N]
   Can you share the name(s) of these businesses? [list]

This survey would have been administered by a combination of phone, mail and electronic outreach to growers throughout the Northeast region. Our aim was to find farms of an appropriate scale that are not currently in Yale Dining’s supply chain - such farms may not currently sell produce to the institutional food service market at all. Although few personnel were at the project’s disposal for conducting this outreach, it was the roadblock described in Section F that rendered the outreach infeasible.

**F. CONTRACT FARMING AND INFORMATION GATHERING ROADBLOCKS**

Large produce farms do not operate similarly to small produce farms. A small farmer typically grows whatever he or she is interested in for a given season and brings it to market either through CSA, farmers’ markets, or through post-harvest contracts. It was assumed that 20, 30, or 50-acre produce farms would operate similarly. This assumption was incorrect. Large farmers cannot depend on CSA or farmers’ markets alone due to the increased volume of their harvest: the possibility of unsold produce grows, as do transportation costs, as acres harvested increases. Thus, the great majority of produce farms over 30 acres rely at least in part on pre-harvest contracting. These pre-harvest contracts set the quantity and price of product before the season begins, spreading risk between buyer and seller. What is grown and the number of acres sown varies each season depending on the nature of commodities markets, seasonal contracts, and weather variations.
This inherent variability from year to year and season to season called into question the usefulness of both the outreach component and the final food map, as everything from productive capacity, crop(s) grown, and price are often determined on a case-by-case basis between buyer and grower. Academic information gathering cannot capture such critical elements. During fact-finding with representatives from several USDA agencies, concerns were also raised about the possible hesitancy of farmers to share crop plans and other sensitive business information on the internet unless through an established grower’s organization, such as NOFA (Northeast Organic Farming Association) or the USDA.

A related yet distinct concern, specific to Yale Dining, is the difficulty of delivery. With approximately 20 campus delivery locations, most farms do not have the operative capacity to deliver directly to Yale. For this reason, Yale Dining has relied heavily on its distributors for sourcing, conglomerating product from different producers, and delivering to its multiple campus locations. Distributors throughout the region work within well-developed routes, and take this into consideration in choosing which farms to source from. This project helped demonstrate the key logistical role distributors play in the food service supply chain.

V. Conclusions

The academic and practical utility of an institutional food-purchasing map is real: providing spatially organized data with the quantity, type, and pricing of produce in the Northeast region would allow for streamlined institutional purchasing. Difficulties arose in the collection of the relevant data and in its inherent variability from season to season. In fact, collecting this data may prove to be impractical due to the nature of large-scale contract farming, privacy concerns and the widely held disinclination to share sensitive business information online.

The only body that can gather complete information about farming in the Northeast is the government. The USDA collects crop plans every season from every farmer detailing his or her production scheme for that season. This information is private and regulations often prevent its useful aggregation even when doing so would allow, say, county by county production trends to be compared.

Farming is a business – in the end, everything comes down to cost. Although the frustrations of this project lie primarily in information gathering, much deeper frustrations, such as the difficulty of finding reasonably priced local produce, can only be fully addressed with policy reform at the Federal level. The need for a map such as this one would evaporate if local, seasonal and affordable produce were
available to institutions through regular distribution networks at affordable prices. The potential solutions to America’s “food crisis” are many, but few seem to have the support in Washington necessary to succeed. Nonetheless, we salute the small farmers whose delicious products we have the privilege to eat.

VI. Other Avenues / Moving Forward

This project could have been modified in a number of ways in order to serve alternate goals. One potential avenue has already been created by the USDA: the Food Environment Atlas, http://maps.ers.usda.gov/FoodAtlas/foodenv5.aspx, is a truly remarkable application that maps farming, retail, and other food trends along with socioeconomic, racial and other data. The most useful feature from the perspective of this project is the “vegetable acres harvested per 1,000 pop” function under “Local Foods”. The incredible productive capacity of California contrasted with that of Connecticut is striking.

Another possible modification would be to focus on the availability of integrated pest management (IPM) produce. Especially in the Northeast, this technique allows for a much more consistent crop (compared to organic) while adhering to many organic principles. Especially in the moist Connecticut climate, foregoing certified organic growing practices can be necessary for larger growers if frequent crop collapse is to be avoided. Less expensive and labor-intensive growing methods also mean that IPM produce is closer to the budget-constrained price points of institutional buyers.

Both the impediments to information gathering and Yale Dining’s unique logistical constraints emphasize the need for engaging a local foods distributor in this project. Grower’s cooperatives, with shared transportation infrastructure and marketing, avoid some of the delivery difficulties from farms to institutions and provide a seemingly viable solution to the delivery conundrum. Helping farmers of similar productive aims connect with one another for the purpose of co-operation is another potential objective for the project.

VII. Resources

In the course of the project many helpful online and personal resources were discovered. The most useful are listed here.

- Map a List: http://mapalist.com/
- CT Farm to Chef Program: http://www.ct.gov/daq/cwp/view.asp?a=2778&q=330830