Apples to Apples: A Local Farm-to-College Feasibility Study Comparing Orange and San Luis Obispo Counties

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Historical Background

Historian Kevin Starr has noted the varied and interconnecting status of agriculture in California. Growing food in the state has been intricately connected with natural resources, politics, and cultures. Agriculture wouldn't have been dominant without the physical development of state water infrastructures like the Sacramento Valley and Delta region or California transportation thruways like railroads and freeways (p. 194-195). Political strikes during the Great Depression about fair labor were organized by groups like the Confederation of Mexican Workers (p. 204) and the National Farm Workers Union (p. 215). California's luring Mediterranean climate and economic entrepreneurial spirit brought the emergence of hard-working and skillful immigrant farmworkers like the Chinese during the Gold Rush (p. 194), Mexicans during the Great Depression (p. 203), and the Japanese starting in the 1920's (p. 225). These natural, political, and cultural factors have and still hold much influence on how food is grown in California.

Historical accounts of agriculture in the state have had mixed developments. The prominence of California agriculture reached the Gold Rush in the late 1800's, "employing more people than…and surpassing mining in 1879 as the leading element of California…into the twentieth century" (p. 110). Wheat in Northern and Central California soon emerged as a major commodity crop throughout the state thereafter (p. 150, 195). In particular, soils in Southern California were soon used as prime agricultural land and those who tended it emerged prosperous:

> "…citrus, vineyards, and other forms of intensive agriculture (olives, deciduous fruits, date palms, honey-producing apiaries) brought to California a new kind of agriculturalist

> – the intensive farmer, educated, middle class, [and] capable of making a living on forty acres. The agriculturalists of Southern California were living on the land…and growers form[ed] cooperatives…for the harvesting, packaging, and marketing of their products" (p. 150-151).

Southern California, especially, was soon finding itself in rapid transformation by the mid-1900's. That time period's physical development could be described by one word: suburbia. Starr notes that "between 1945 and 1960, the San Fernando Valley…was transformed from a landscape of ranches, farms, and small towns into a near-continuous suburbia of tract housing, swimming pools, boulevards, and shopping centers" with over 10,000 housing lots developed in that very period. State population, migration, and roadways increased exponentially (p. 237-239). In particular, Orange County boomed in population and housing with the completion and growth of Disneyland and its "city planning paradigm". Between 1950 and 1960, the population tripled to over 700,000, and 2,500 housing tracts with 144,000 building lots emerged (p. 241). There were suddenly more mouths to feed in an area of California that was losing its prime agricultural land to skyscrapers, houses, buildings, and institutions (Starr, 2005).

A Framework of Study

Historical accounts of the aforementioned tension between sustaining agricultural systems and urban development, especially in Southern California, create a framework to study current and future demographic and non-demographic trends. How feasible is it to consume food that is produced within one's area? What does a Southern California "foodshed", an "area that is defined by a structure of [a] supply" of food, look like? (Getz, 1996). Where does food grow? Who is growing it? What is the supply? Is there a demand from Southern Californian populations to eat and value such agricultural systems? What is it like to eat locally?

To define the parameters of such questions, this study seeks to understand the feasibility of supplying local food to institutions of higher education (universities). This study's data is

within the geographic supply of the university's respective county and the university population's demand for local food. The study will be framed in the context of supply and demand indicators. Two university cases studies will be compared: the University of California, Irvine (UCI) in Orange County (OC) and California Polytechnic State University, San Luis Obispo (Cal Poly SLO) in San Luis Obispo County (SLOC). Demographic data that will be assessed include county populations, university populations, university populations' demand for local food, county urbanization trends, and the type of county agricultural workforce. Non-demographic data include county geography and the amount and types of farms.

Why Local?

Consuming food that is produced within one's local foodshed has ecological and environmental effects that are often overlooked. According to the Stern Review Report on the Economics of Climate Change, 14% of greenhouse gases are directly attributed to industrial agricultural activities (i.e. use of chemical inputs, monoculture production), 18% to land use and deforestation of globalized agriculture, and 14% to transportation. These figures, when calculated into the bigger picture, contribute to a quarter of the world's total greenhouse gas emissions toward climate change (Stern, 2007). In the United States, growing, processing, and distributing food accounts to 20% of current U.S. fossil fuel consumption (Pollan, 2007). The average food item now travels approximately 1,500 miles from field to plate, which includes processes like packaging, long-distance refrigeration, and massive transportation infrastructure systems (Imhoff, 2007; The International Commission on the Future of Food and Agriculture, 2008). As "most of the observed increase in global average temperature since the mid-20th century is very likely due to the observe increase in greenhouse gas emissions", eating food locally can be a solution to reducing emissions in a world using more non-renewable energy

sources each and every day (International Panel on Climate Change, 2008; Hill, 2008; Kotschi & Muller-Samann, 2004).

In addition to the ecological benefits of eating local food, there are nutritional and cultural ones, as well. The way local food is grown often distinguishes itself from "industrial" food grown farther away. For example, the majority of food grown at farmers markets in America is not only local in origin but is also grown organically or "sustainably" (Feenstra et al., 1997; Gold, 1999). These methods eliminate or reduce the use of chemical inputs that deplete natural resources and produce food that is more nutrient-rich to better nourish bodies (Thompson et al., 2008; Worthington, 2001). Local food can ensure the continuation of cultural cuisines, the production of special crop varieties, the pleasure of face-to-face conversations around food, and greater community food security (Halweil, 2002).

Why Universities?

The movement to source local food at colleges and universities in the nation within the context of a community-based foodshed has emerged fairly recently in the last few years. Students at over 300 universities have joined the Real Food Challenge in order to advocate for more humane, ecologically-sound, fair, and local food purchasing. The Real Food Challenge recognizes that universities in the United States spend over $4 billion dollars on food each year, and that purchasing power can be invested towards local foodsheds (Real Food Challenge, 2008). Several universities such as New York University and the University of California at Berkeley, have focused on improving food options, purchasing, energy efficiency, waste reduction, and student education (UC Berkeley, 2005; UC Santa Cruz, 2007; Rojas, 2008; Greening Urban Campus, 2008). However, few have viewed their respective universities as part of local agricultural communities and economies. These assessments do not incorporate a

community-foodshed model that ascertains the feasibility of supplying local food to people who live in the surrounding area. Universities play a pivotal role in reshaping our food system when they choose to shift their own dining plans toward sustainable practices:

> Institutions are major players in the food system and their operations often provide producers with significant volume, as well as predictable and stable demand. Institutional purchasers have the ability to leverage their buying power to encourage multiple stakeholders in the food system to participate in developing local, sustainable food systems (Nield, 2008).

Demand Indicators

What the demand for local food at universities? Indicators include county and institutional populations, prevalence of agricultural and/or food studies curriculum, and student demand for local food.

County and Institutional Populations

As of 2008, Orange County has over ten times the population of San Luis Obispo County, reaching a little over three million. While there are more students enrolled and eat on-campus at UCI, Cal Poly SLO has a much higher percentage of students who live within the county (7.3% compared to 0.9%). Both universities yield similar percentages of total students who live on-campus (Table 1).

University Demand for Local Food

Demand for local food at universities was expressed by two sub-indicators. First, the total percentage of students enrolled in agricultural and/or food studies curriculum was assessed. Educational curriculum in agricultural and food studies signifies institutional support, student interest, possible research, community outreach, and academic inquiry. One-fifth of students at Cal Poly SLO are currently enrolled in agricultural, food systems, and food environmental

studies education. On the contrary, UCI Irvine does not offer agricultural or food studies academic programs, and thus, 0% of students are enrolled in such curriculum (Table 1).

The second sub-indicator is demand for local farm-to-college programs at universities. In a 2008 National Farm-to-Institution College Student Survey, 181 random first-year university students in California were asked if they would be willing to pay at least an extra quarter for a salad that costs $3.50 and has ingredients that were grown, processed, and distributed locally. Results showed that nearly 70% of participants would be willing to pay the extra costs. The same question and methods were used in this study to assess local food demand from a sample of 51 UCI first-year students and 49 Cal Poly SLO first-year students. Cal Poly SLO students support the California average, with about 71% willing to pay the extra quarter. About 31% of UCI students would be willing to pay. While 8% of Cal Poly SLO and 11% of California students would not be willing to pay, nearly 57% of UCI students indicated unwillingness to pay (Table 2). The results from this second sub-indicator suggest that there may not be general awareness and educational curriculum in local food and food systems at UCI compared to Cal Poly SLO and other universities in California. It may also indicate that UCI students may not be willing to pay more for local food, not necessarily because there is lack of interest, but because they may not be fiscally able to.

From this demand indicator, it is noted that a greater percentage of students at Cal Poly SLO live within the county, are being educated in agricultural and food studies, and are willing to pay more for local food in their universities. To offer greater historical and geographical context to such conclusions, the greater San Luis Obispo County in which Cal Poly SLO resides has a rich and thriving local food movement compared to OC. SLOC residents have demanded local food in county, whether it was building local produce and meat cooperatives, organizing

non-profit organizations dedicated to local food, or voting against county ballot initiatives for genetic-food-engineering companies that would detriment local food supplies (San Luis Obispo The Tribune, 2008, December 22; Edible San Luis Obispo, 2009; Hoare, 2005). Such efforts are not visibly demanded in OC as they are in SLOC.

Supply Indicators

With an understanding of demographic demand at UCI and Cal Poly SLO for local food, is there a supply of it within their respective counties? Supply indicators include county geography and urbanization trends, county agricultural workforce, and the numbers, sizes, and types of farmland.

County Geography, Farm Numbers, and Farm Sizes

While OC may be ten times more populous, SLOC is over four times larger in total area and land area and has twice the amount of total water area. This stark contrast between population density and land-use yields similar comparisons with county agriculture. According to the 2002 and 2007 Census of Agriculture, SLOC had eight to nine times more total farms. From 2002 to 2007, the total number of farms increased in SLO County and decreased in Orange County. An interesting note of comparison is the average number of people in the county per acre of farmland: 0.03 of a person/farmland acre in OC and 5.2 people/farmland acre in SLO. There are more natural resources, total farmland, and average number of people in SLOC than OC (Table 3).

County Farm Typology

There is a greater percentage of agricultural land in San Luis Obispo County dedicated to local consumption. According to the California Department of Conservation, there are two types of farmland: (1) farmland for out-of-county food exports and (2) farmland of "local agricultural

importance". While both counties export the majority of their food production, SLOC dedicates more of its land toward local production (17.2%) compared to OC (10.6%) (Table 3).

County Urbanization and Physical Development Trends

In a demographic context, Orange County has a greater percentage of urban development than San Luis Obispo County. Planned-development (housing, work buildings, public & private buildings) has immense implications for future food production. More urban and physical development implies less grounded land for food production. Nearly half of Orange County's land (46.9%) is urban and built-up while 1.9% of SLOC's land is characterized as such (Table 3).

County Agricultural Workforce

A final supply indicator for local food at universities is the county's agricultural workforce. How many people within the county farm and grow food? A university, unless it can sustain its own food needs, cannot source local food if there are not people tending to farms and ranches. While both counties do not support high numbers of people employed in agriculture, SLOC has nine times the amount and a greater percentage of farm operators (2.3%) than OC (0.03%). In both counties, the average age of farm operators is similar (about 60 years) and the majority of them are White. It is noted that there is a significantly higher percentage of farm operators in OC of Asian, Spanish, Hispanic, and Latino origin than SLOC (Table 3). While data suggests a more diversified workforce in OC, there is a higher percentage of agricultural workers in SLOC.

Conclusion

This study sought to determine the feasibility of local farm-to-college programs at the University of California, Irvine and California Polytechnic State University, San Luis Obispo

within the reference of "county foodsheds". Demographic and non-demographic data was analyzed in the context of supply and demand indicators to better understand whether or not the supply of local food would meet university demands. It was found that there are more institutional programs and greater demands for local food at Cal Poly SLO. Furthermore, there is a higher percentage of farmland dedicated to local agriculture and a greater percentage of farm operators in San Luis Obispo County than Orange County. Results show higher urbanization trends in OC. Based on the supply and demand indicators and results examined in this study, it is more feasible to create a local farm-to-college program at Cal Poly SLO than UCI.

Historical Context

Why is the potential for Orange County to supply local food to its population and institutions lower than San Luis Obispo County? Answering such a question requires a brief understanding of Orange County's agricultural history. As mentioned in this study's historical background, pre-WWII- Southern California was prime agricultural land. Orange County, in particular, reached its peak in 1930, when "farmers and ranchers grossed fifty-one million Depression dollars from citrus, walnuts, beans, sugar beets, peppers, tomatoes, and livestock". The San Francisco Chronicle at the time headlined Orange County as "One of the Most Prosperous Counties", and by 1938, an impressive 86% of the county's land was used for farming or ranching (with the largest portion set aside for citrus) compared to the 7.8% today (Emmons, 1988; Table 3).

As soldiers returned home from the war, they and their families began looking for housing. Urbanization intensified from then on out (Figure 1). From 1954 and 1963, "79% of Orange County's agricultural land was converted to housing, businesses, schools, and highways". Increased property values, little government support for diversified agriculture, and

an economic shift to commodity and genetically-engineered crops soon left Orange County without a strong local foodshed. Fred Keller, chief of farming operations during the 1980's for The Irvine Company, a major landholder in Orange County, said in 1985 that his firm was in agriculture "only because it made enough to pay the property taxes and break even" and "if Orange County agriculture disappeared overnight, you'd never notice it" (Emmons, 1988). The Irvine Company leased its farmland and withdrew from agriculture altogether in 1988.

Today, San Luis Obispo and Orange Counties' long-term development plans with regards to agriculture and local food production have common and contrasting policies. San Luis Obispo County has adopted sustainable Smart Growth principles in their county's planning policies, identifying the importance to "conserve agricultural resources and protect agricultural land" (San Luis Obispo County Department of Planning and Building, 2009). In Orange County, while the Irvine Company has and is withdrawn from agriculture, there are still a small portion of individual farm operators growing food in west and central county with preservations in the south (Orange County Assessor, 2005; Figures 2 and 3).

Understanding the feasibility of eating locally within the context of a respective county or region in California brings to light human impacts on the natural environment, local agricultural history, current demographic, social, and political trends, and future-projected land uses. As found in this study, a university – oftentimes a major stakeholder in a community – plays a significant role in how one eats.

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Table 1

Demand Indicators for Local Farm-to-College Food Programs: UCI and Cal Poly SLO

	California	Orange County	UC Irvine[1]	SLO[2] County	Cal Poly SLO[3]
Population					
Population, 2008 estimate (a) (b)	36,756,666	3,010,759	27,631	265,297	19,471
Percentage of University Students in County[4]	-	-	0.9%	-	7.3%
Population of University On-campus Resident Students	-	-	8,000	-	6,000
Percentage of University On-campus Resident Students	-	-	29.0%	-	30.8%
Involvement in Agriculture & Food Studies Degrees & Interest in Local Food					
Percentage of University Students Enrolled in Official Agricultural or Food Studies Degrees, 2008	-	-	0.0%	-	20.3%
Percentage of Students Willing to Pay More for Local Food[5], 2008 & 2009	69%	-	31%		71%

[1] University of California, Irvine

[2] San Luis Obispo

[3] California Polytechnic State University, San Luis Obispo

[4] It is assumed that all university students live within the county.

[5] National and California results of 181 respondents are from National Farm to Institution College Student Survey, University of California Santa Cruz-Center for Agroecology & Sustainable Food Systems. (2008). UC Irvine and Cal Poly SLO results of 51 and 49 randomized study respondents, respectively, are from similar survey questions. Vo, H. Farm to Institution College Student Survey. (2009).

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

Source: US Census Bureau State & County QuickFacts

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Table 2

Farm-to-Institution College Study: California, UCI, and Cal Poly SLO

	California Universities	UC Irvine[1]	Cal Poly SLO[2]
Total Study Participants	181	51	49
Number of Study Participants willing to pay	125	16	35
Percentage of Study Participants willing to pay	69.0%	31.4%	71.4%
Number of Study Participants unwilling to pay	20	29	4
Percentage of Study Participants unwilling to pay	11.0%	56.9%	8.2%
Number of Study Participants unsure	36	6	8
Percentage of Study Participants unsure	19.9%	11.8%	16.3%

[1] University of California, Irvine

[2] California Polytechnic State University, San Luis Obispo

Table 3

Supply Indicators for *Local Farm-to-College Food Programs: UCI and Cal Poly SLO*

	California	Orange County	UC Irvine[1]	SLO[2] County	Cal Poly SLO[3]
Geography					
Total Area, 2006 (acres)	104,765,120	606,720	1,500	2,313,920	9,678
Total Land Area, 2006 (acres)	99,813,950	505,220	-	2,114,750	-
Total Water Area, 2006 (acres)	4,951,170	101,500	-	199,170	-
Farm Numbers and Sizes					
Number of farms, 2007	81,033	325	0	2,784	1
Number of farms, 2002	79,631	348	0	2,322	1
Land in farms, 2007 (acres)	25,364,695	87,435	0	1,369,604	30
Average Number of People per Acre of Farmland, 2007, using 2008 Population Data	0.7	0.03	0	5.2	0.002
Farm Land Typology					
Total Farmland, 2006 (acres)	28,850,441	47,571	0	1,012,411	30
Percentage of Total Farmland to Total Area, 2006 (acres)	27.5%	7.8%	0	43.8%	0.3%
Total Farmland of California, National, and International Importance, 2006 (acres)	25,955,950	42,543	0	837,861	-
Percentage of Farmland of California, National, and International Importance, 2006	90.0%	89.4%	0	82.8%	-
Total Farmland of Local County Importance, 2006 (acres)	2,894,491	5,028	0	174,550	30
Percentage of Farmland of Local County Importance, 2006	10.0%	10.6%	0	17.2%	100.0%
Urbanization and Physical Development Trends					
Total Urban and Built Up Land, 2006 (acres)	3,482,177	284,274	-	43,729	-
Percentage of Total Urban and Built-Up Land, 2006 (acres)	3.3%	46.9%	-	1.9%	-
Agricultural Workforce*					
Total Number of Individuals Employed, 2007	16,573,971	1,536,963	-	200,572	-
Total Number of Farm Operators, 2007	130,756	518	-	4,559	-
Percentage of Farm Operators to other Employment, 2007	0.8%	0.03%	-	2.3%	-
Average age of Principal Farm Operator, 2007 (age)	58.4	60.2	-	59.2	-
Percentage of Farm Operators considered American Indian or Alaska Native, 2007	1.4%	0.6%	-	1.1%	-
Percentage of Farm Operators of Asian ethnicity, 2007	4.4%	17.4%	-	2.3%	-
Percentage of Farm Operators of Black or African American race, 2007	0.3%	0.4%	-	0.2%	-
Percentage of Farm Operators considered Native Hawaiian or Other Pacific Islander, 2007	0.2%	0.4%	-	0.3%	-
Percentage of Farm Operators considered White, 2007	90.0%	76.8%	-	92.9%	-
Percentage of Farm Operators of Spanish, Hispanic, or Latino Origin, 2007	10.9%	16.6%	-	7.4%	-
Percentage of Farm Operators of more than one race, 2007	0.8%	1.7%	-	0.8%	-

[1] University of California, Irvine
[2] San Luis Obispo
[3] California Polytechnic State University, San Luis Obispo
* Does not include farmworker labor.

Sources:
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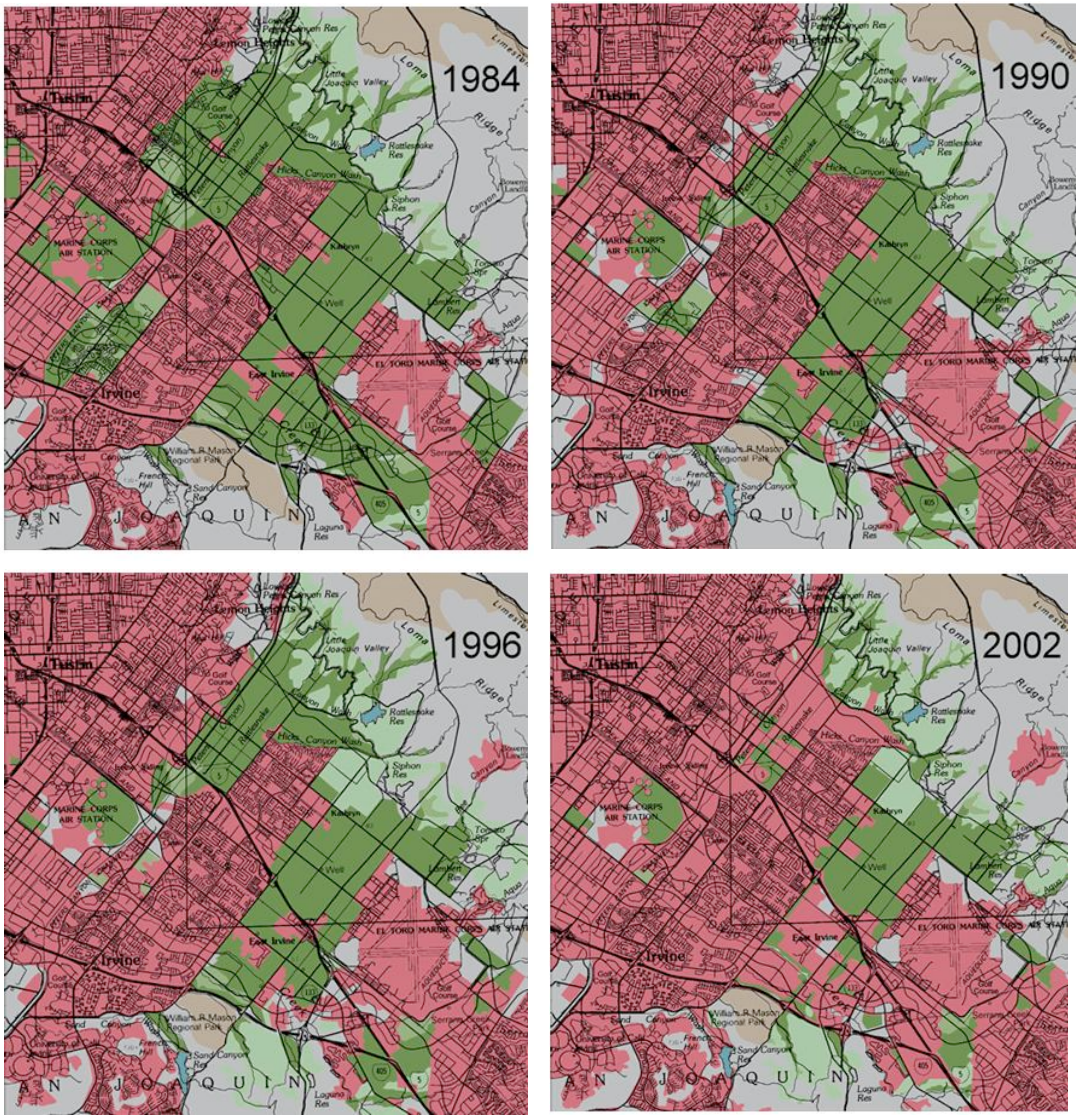
See Figures 4-6 for Maps of California, Orange County, and San Luis Obispo County Farm Land Typology and Urbanization Trend Data

Figure 1

1984 to 2002 Time Series: Irvine, Orange County
Farmland Mapping and Monitoring Program, Geographic Information Systems



Source: California Department of Conservation. (2006).

Legend

Prime Farmland (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland (U): Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee. Download a complete set of the Farmland of Local Importance definitions in PDF format. In some counties, Confined Animal Agriculture facilities are part of Farmland of Local Importance, but they are shown separately.

Grazing Land (G): Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.

Urban and Built-up Land (D): Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land (X): Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Water (W): Perennial water bodies with an extent of at least 40 acres.

Figure 2

Orange County, California: Prime Farmland, 2005

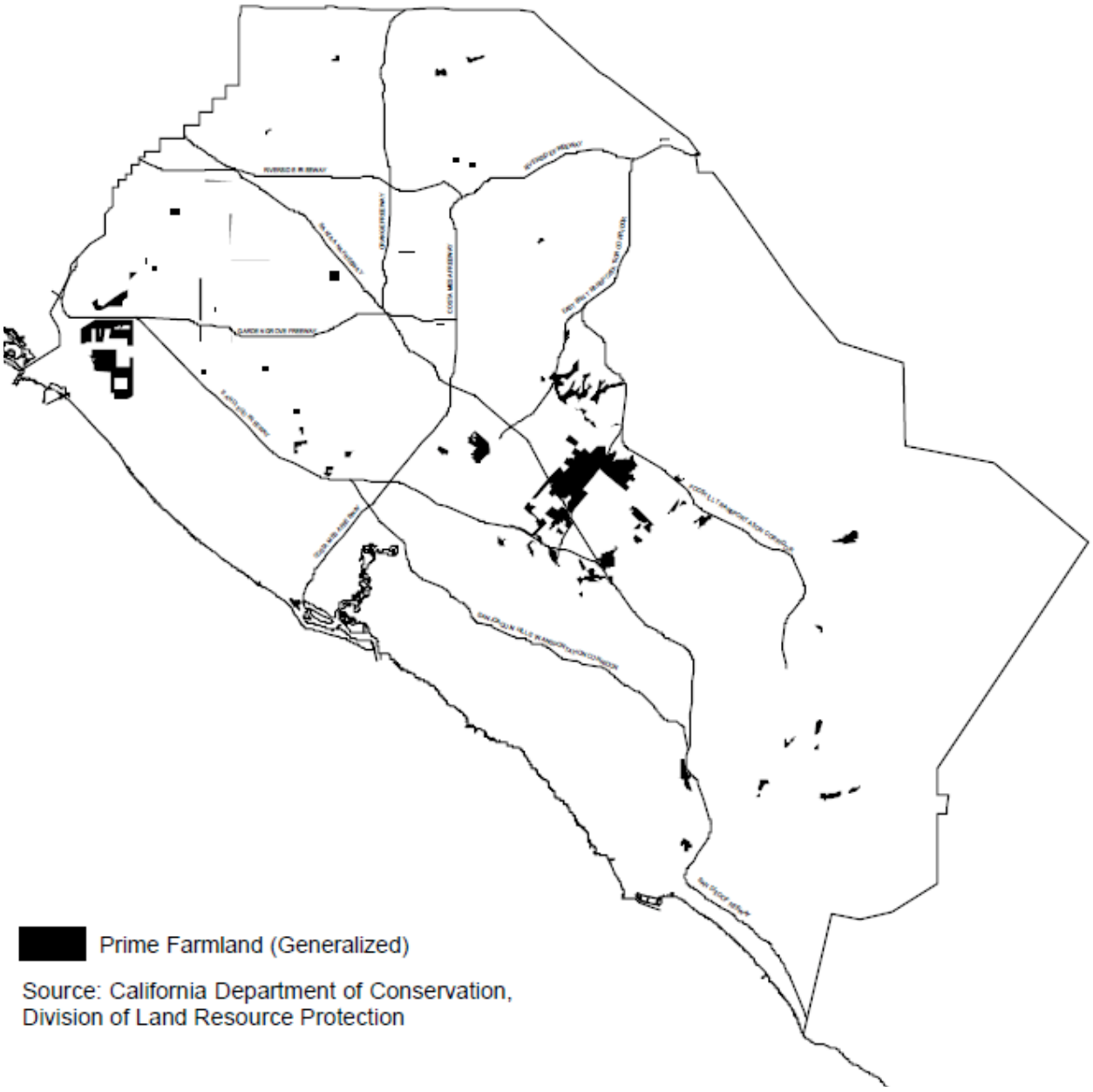
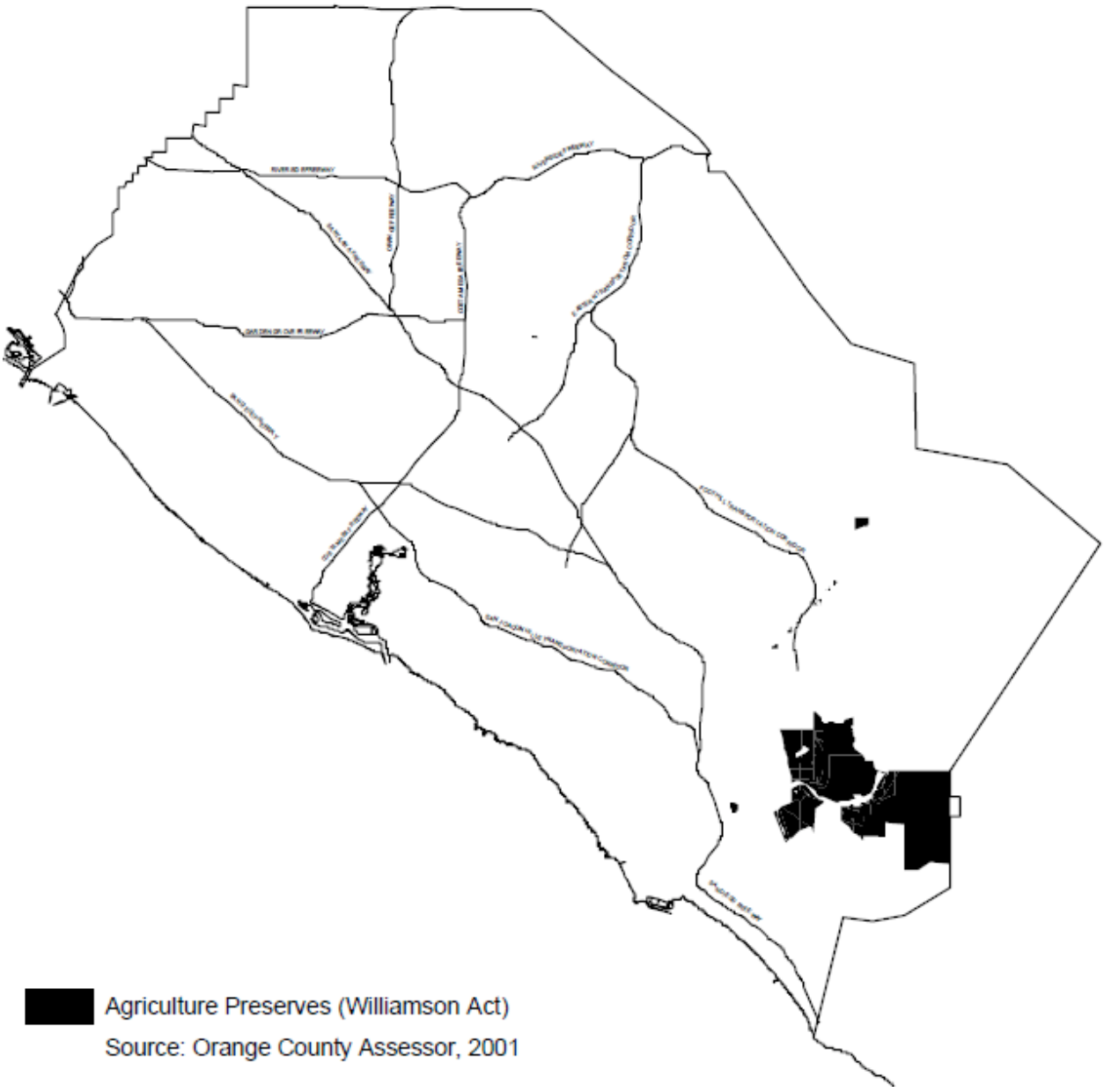


Figure 3

Orange County, California: Agriculture Preserves, 2001



Note: The Williamson Act, otherwise known as The California Land Conservation Act of 1965, "enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value". 0.88% of Orange County's total land area is dedicated to agriculture preserves enacted by the Williamson Act, compared to the 37.10% in San Luis Obispo County. (California Department of Conservation, 2009; Retrieved May 19, 2009, from http://www.conservation.ca.gov/DLRP/lca/Pages/Index.aspx; California State Association of Counties, 2009; Retrieved May 19, 2009, from http://www.csac.counties.org/legislation/williamson_act/williamson_act_county_acreage.pdf)