

GEOG 176C
GIS Applications
Spring 2016

Gengchen Mai



About Me



- **Name:** Gengchen Mai
- **Dept:** Geography, UC Santa Barbara
- **Lab:** STKO Lab (ELLSN 4839)
- **Email:** gengchen_mai@geog.ucsb.edu
- **B.S.** From Wuhan University
- **Dept:** Dept of GIS & Cartography
- **Major:** Geographic Information System



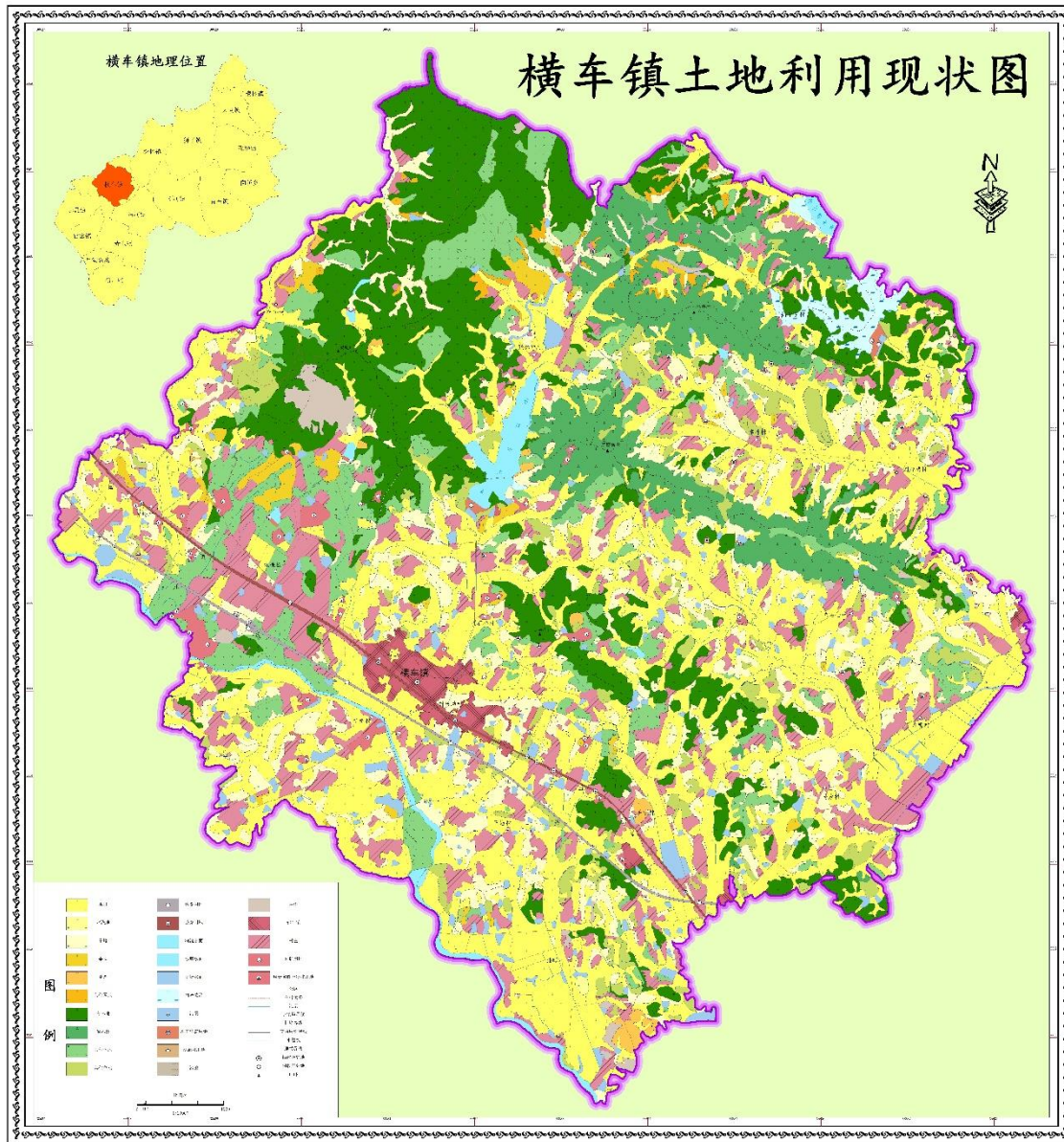
Information about this Class



- Office hour: *Monday 10am-12 ELLSN 2616*
- Session: *Friday 12:00- 1:50 ELLSN 2610*
- *My office: ELLSN 4839*

My Previous Project: Cartography

- ArcGIS



My Previous Project: Cartography



横车镇土地利用结构图

横车镇地理位置



说明

本图的制图区域只是横车镇的一部分地区，面积大约是整个横车镇面积的40%，但是包含了横车镇的镇政府及其周边城市化较高的地区，由于缺少横车镇制图区域内各个行政村人口数，本图采用下列方法计算各个行政村的城市人口数和农村人口数：

$$PCc = PCw$$

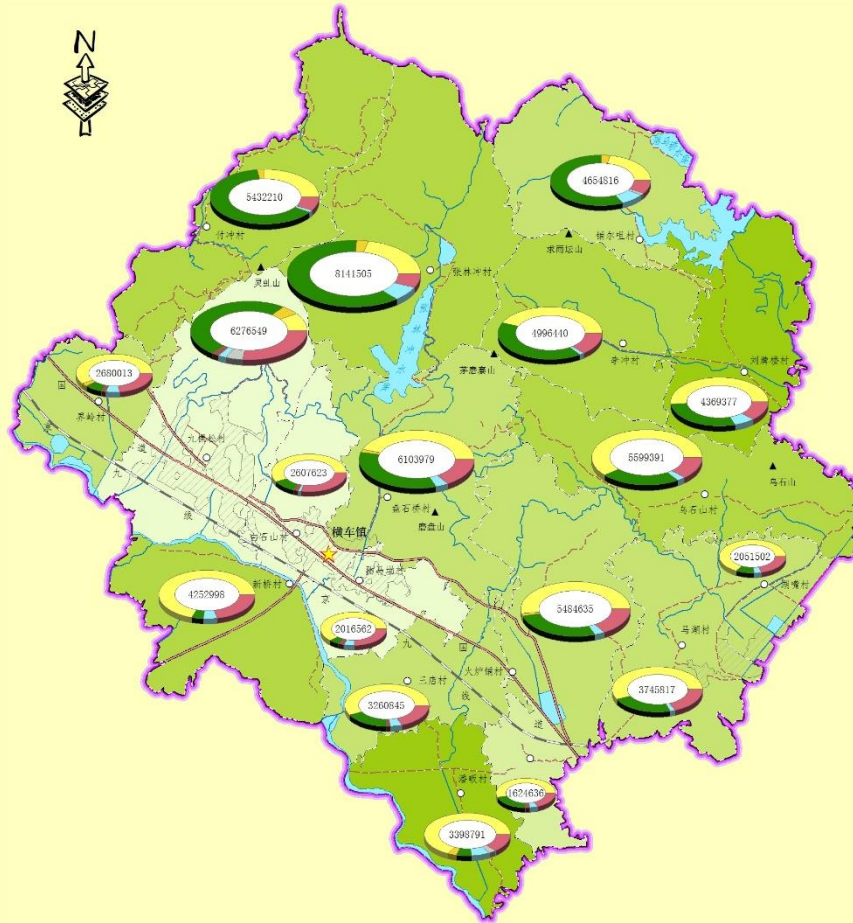
$$PAc = PAw * Ac / Aw$$

各个行政村的城市、农村人口：

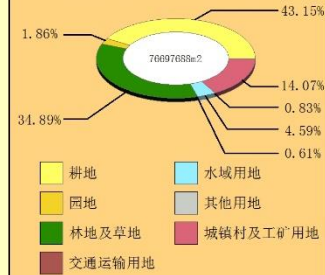
$$PCci = PCc * ACci / ACc$$

$$PAci = PAc * AACi / ACc$$

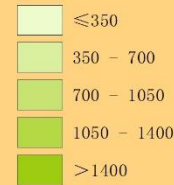
PCw, PAw: 横车镇城市、农村人口数；
 PCc, PAc: 制图区域城市、农村人口数；
 Aw, Ac: 横车镇、制图区域面积；
 PCci, PAci: 第i个行政村的城市、农村人口数；
 ACc, AAC: 制图区域的建制镇、村庄总面积；
 ACci, AACi: 第i个行政村的建制镇、村庄图斑面积；



横车镇土地利用结构



人均耕地面积 (平方米/人)



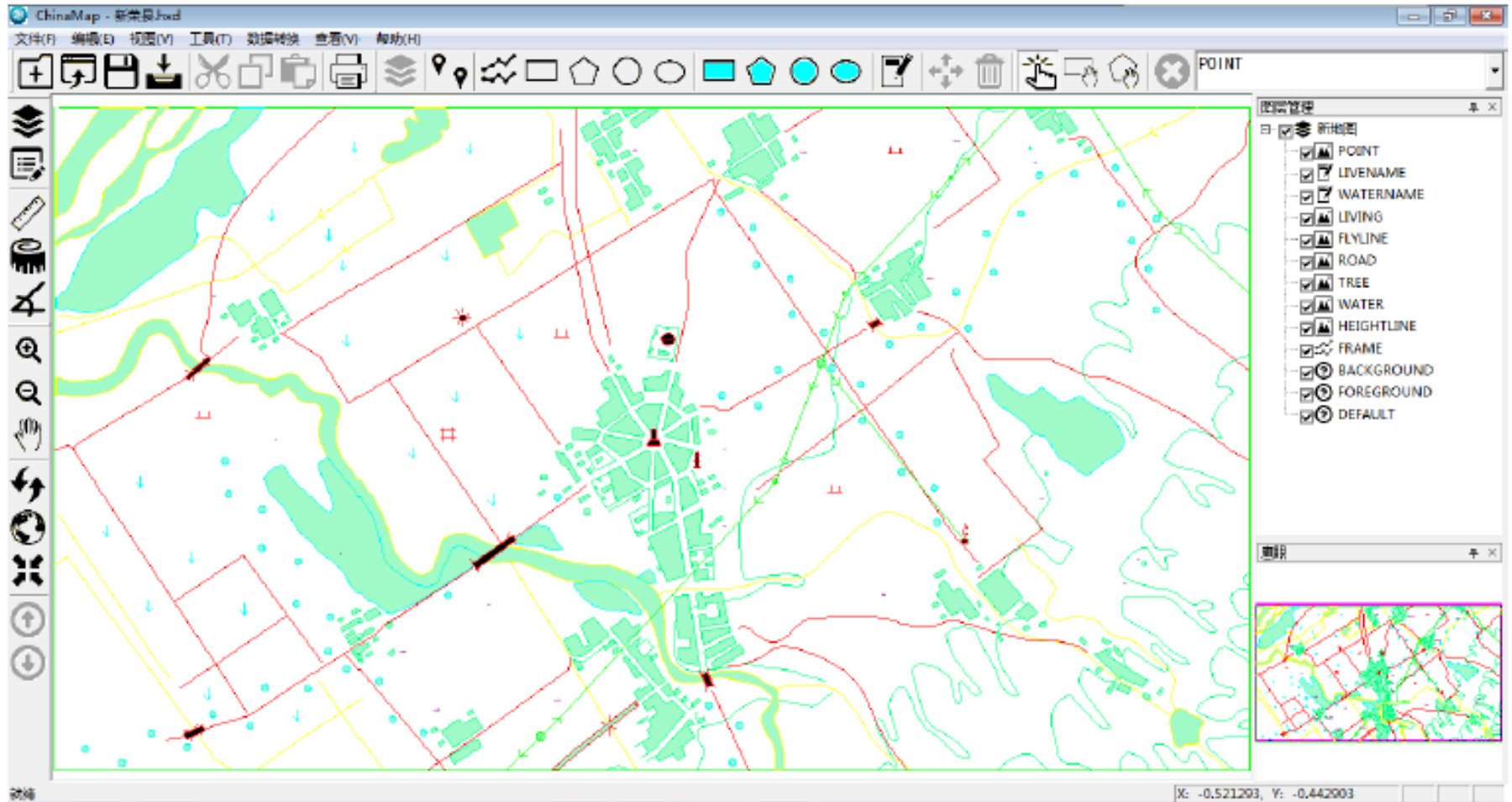
图例



比例尺 1:50000

My Previous Project:

- A small GIS application using MFC/C++



Analysis the data from dianping.com



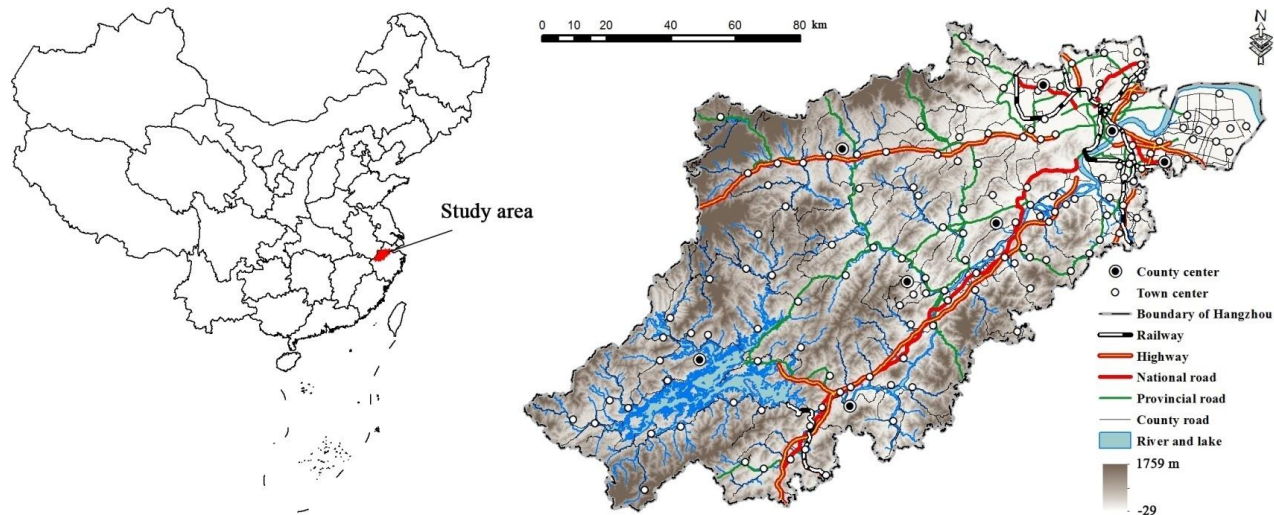
- Collecting the coordinate, check-in data , decoration grade, service grade, product grade of the restaurants in Hangzhou from dianping.com, calculating the quality value of each restaurants.
- Analysis the potential relationship between quality value and spatial distribution of these restaurants (path distance to nearest district, ATM, education centers, other POIs and service population)



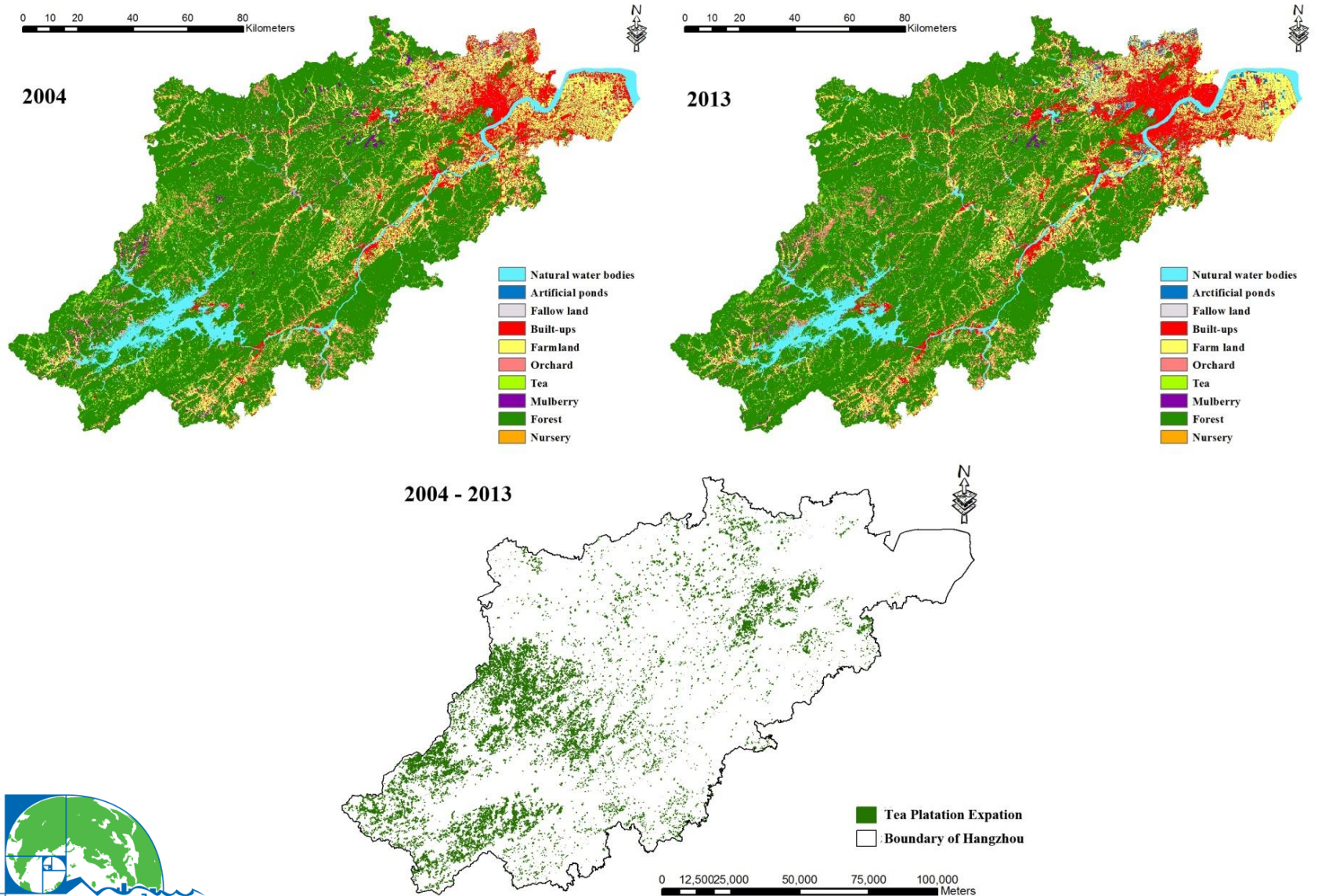
Undergraduate Thesis Project

Tea Plantation Expansion in Southeast of China: Process, Driving Forces & Ecological Effect

- Spatial Analysis:
 - *Calculating the area of TPE according to slope, elevation, the distance to water bodies, every kind of roads, every kind of social centers.*
- Study of Driving force (Socioeconomic indicators)
 - *Spatial lag regression (GeoDa) between socioeconomic factors and area of TPE of every counties in Hangzhou: population, incomes, public revenue & expenditure*
- Ecological effect of TPE (Landscape Pattern Analysis)
 - *Spatial regression between area of TPE and rate of changes of 6 Landscape Matrics (FRAGSTAS): PD, ED, LSI, SHAPE, PAFRAC, AI*



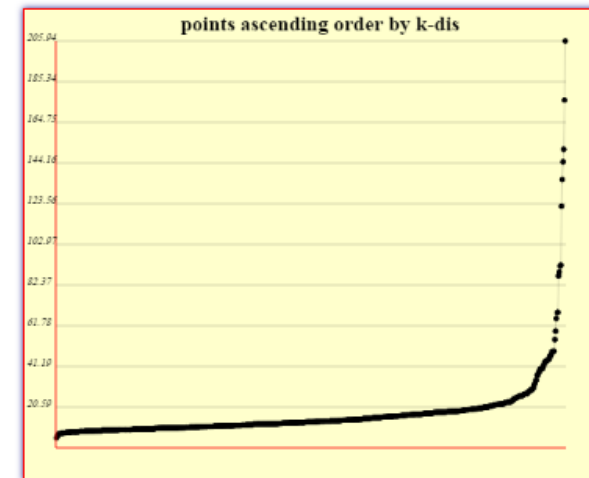
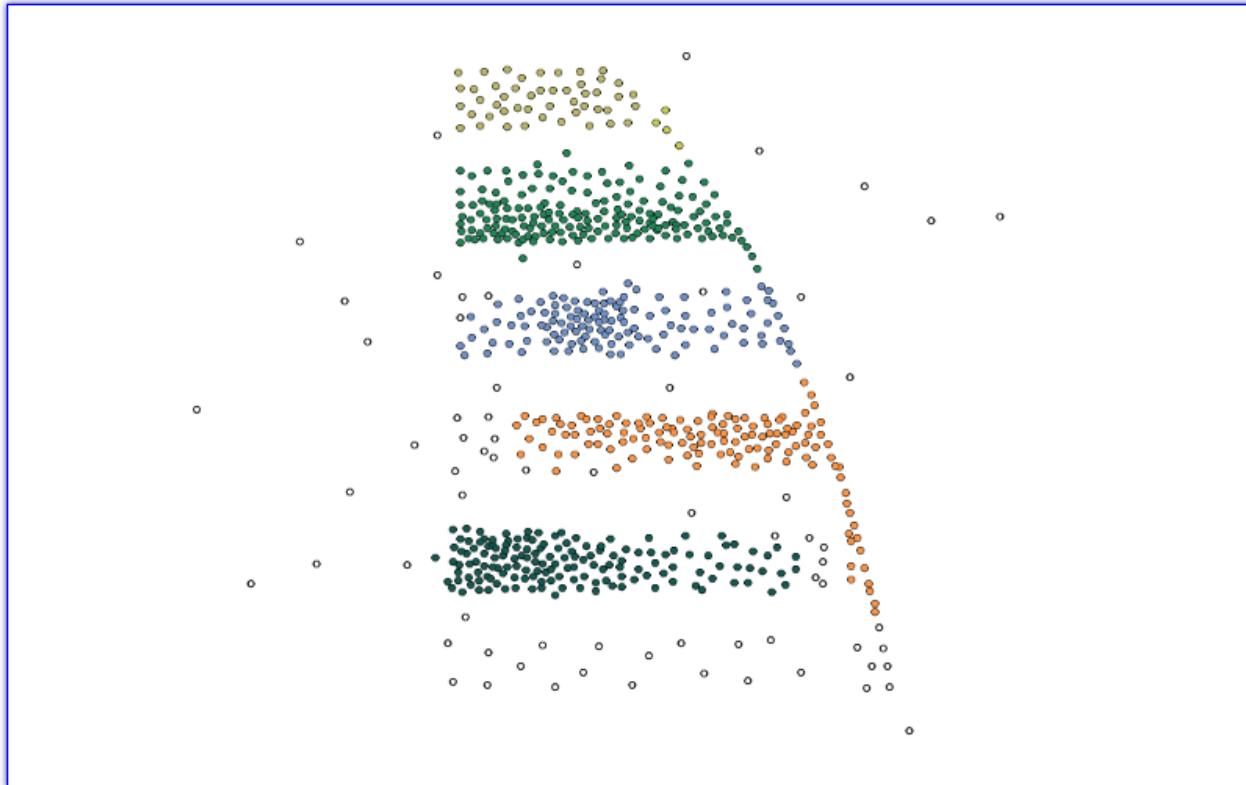
LULC & Tea Plantation Expansion (TPE)



Data Mining: DBSCAN prototype

DBSCAN prototype

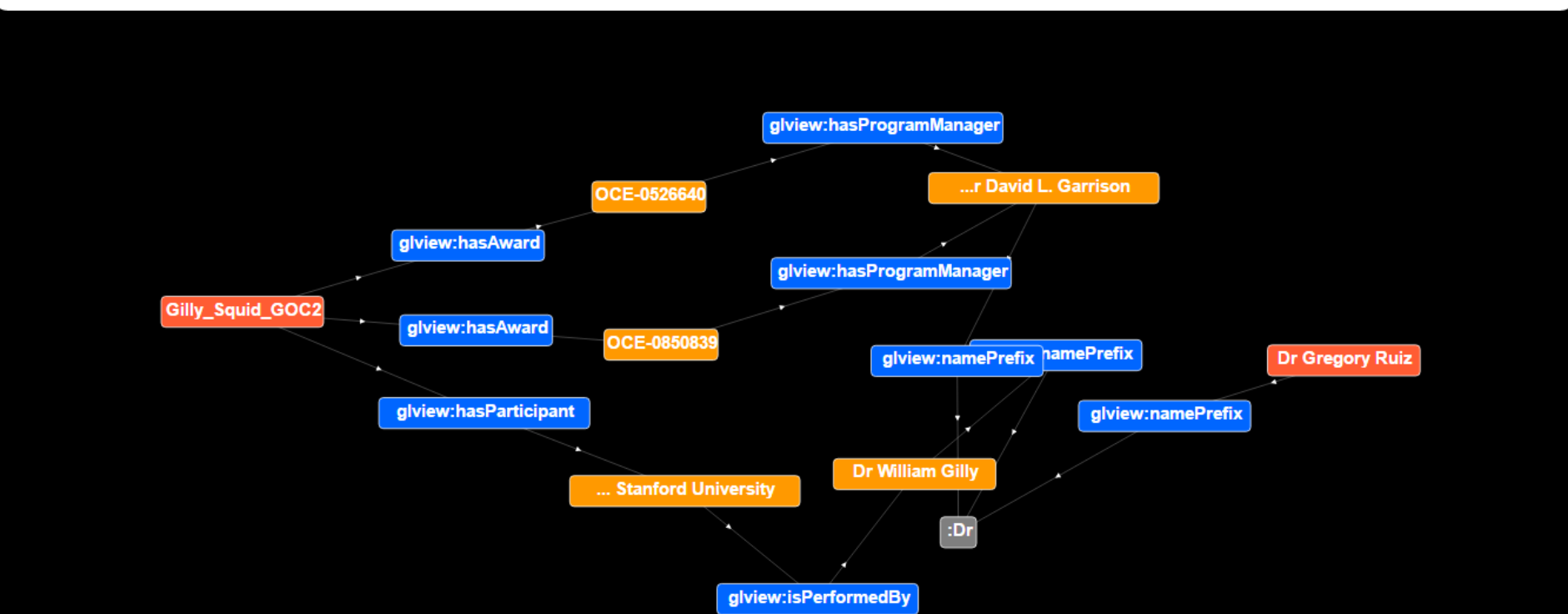
Eps: MinPts: **KNN Plot** **OPTICS**
PointSet Name: Select PointSet: Open Points File:
RUN **CLEAR** **UNDO** **SAVE POINTS** **SAVE POINTS A.S...**
PolygonSet Name: Select one PolygonSet: Open Polygons File:
DRAW POLYGON **POINT IN POLYGON** **UNDO POLYGON** **SAVE POLYGONS** **SAVE POLYGONS A.S...**



Semantic Web: Relationship Finder

Relationship Discovery

Type:	<input type="text" value="glview:Cruise"/>	Type:	<input type="text" value="glview:Person"/>	Path Max Distance:	<input type="text" value="4"/>	Query
Select:	<input type="text" value="Gilly_Squid_GOC2"/>	Select:	<input type="text" value="Dr Gregory Ruiz"/>	Show TBox Relationship:	<input type="checkbox"/>	<input type="button" value="Query"/>



Suggestion about your project

- A project you can finish in 8-10 weeks (you do not need to do a project as complex as what I show here)
- It is highly recommended that one group should have a leader, and every one *should* participant in this project.
- Communicating with TA is important! Let me know your progress every week.
- Project type: GIS desktop Application, GIS Web Application, Spatial Analysis/Statistic Research
- Programming language: C, C++, C#, Java, Python, R, Javascript, Matlab, PHP, (*ArcGIS Engine/ .NET*)
- GIS/RS software: ArcGIS, ERDAS, ENVI, QGIS, GeoDa, Fragstats, Supermap, AutoCAD, Coreldraw
- Interest in Semantic Web/Ontology? Protégé, Jena Fuseki ...
- **Come up an idea and use some of them**

TimeLine



Date	Topic	Text Chapter	Assignment
03/28/16	Class Objectives, Overview, and Ideas		Prepare lightning talk
03/30/16	Geo-Data, VGI, and Applications		
04/04/16	Lightning talks		Lightning talk due
04/06/16	Data Entry and Editing	4	Join/form a group
04/11/16	The Internet as Application Platform		
04/13/16	GeoWeb and Spatial Data Infrastructures	14	Prepare proposal
04/18/16	The Internet as Application Platform		
04/20/16	Library Data (GS)		Prepare proposal talk
04/25/16	Proposals (1)		Proposal & talk due
04/27/16	Proposals (2)		Proposal talk due
05/02/16	Proposals (3)		
05/04/16	Simple Scripting on the GeoWeb		
05/09/16	Using Social Media in GIS/GIScience (GS)		
05/11/16	GIS for Disaster Relief (GS)		Prepare final report
05/16/16	Geo-Cloud Computing (GS)		
05/18/16	The Future of GIS / GIScience	15	
05/23/16	Final presentations (1)		
05/25/16	Final presentations (2)		Prepare final presentation
05/30/16	Holidays		Final presentation due
06/01/16	Final presentations (3)		Final presentation due
06/02/16	spatial@ucsb.local2016 (optional)		Final report due / poster due

Important informations



- **Lightning talk:** Apr. 4th, 1-2 slides, < 2mins, individual work (10 points) *Call for collaboration!*
- **Group:** 3-4 people, **it is highly recommended that all project members are in the same lab slot**
- This lab participation and your style of interaction during the labs will be graded by the TAs (up to 10 points)
- **Project information:** due Apr. 11th 8am, project name, goals, a brief outline of your idea, a list of project participants
- **Project Proposal:** 2300-2500 words long, (name, all participants, list of data, list of methods, motivation, research or application question, expected results, and an outline of potential difficulties and challenges), due Apr. 25th 9am, 1 proposal for each group (15 points)

Important informations



- **Proposal talk:** Apr. 25th/27th , 3-10 slides, 5-7mins, 2 mins discussion, 1-2 group members each group (5 points)
- **Final report:** 3500-3700 words long, due June 2nd 9am, one report for each group(12 points)
- **Final presentation:** due May 23rd 9am, 1-2 people on May 23rd or May 25th, 7-10 mins, 2mins discussion (20 points)
- **Final exam:** during final week (20 points)
- **Poster (optional):** June 2nd , cost covered, final report up to one week later by June 9th 9am (10 extra points)

- **(all slides should be in PDF format)**