GEO874-001

Frontiers in Geospatial Sciences and Socioeconomic Connections

Class Webpage: http://lees.geo.msu.edu/courses.html

Instructor

Dr. Jiquan Chen, Professor, Email: jqchen@msu.edu; Office: Geography 206, or Manley Miles 201

Guest Instructors

Dr. Ranjeet John, Email: ranjeetj@msu.edu; Office: Manley Miles 202

Dr. David Reed, Email: reeddav2@msu.edu; Office: Manley Miles 202

Time: 12:30 – 2:30, Wednesdays

Location: Room 105, Manly Miles

Who are we:

1) Piero Sciuscop, New PhD (RS)
2) Jiang Chang?

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CLASS LIST with Images

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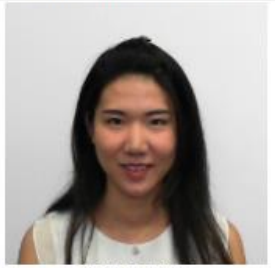
Subject	Course	Section	Semester	Course Title	Instructor
GEO	874	001	SS18	Seminar Geographic Info Sci	CHEN

A52707630
Haghtalab, Nafiseh

A50152511
Hatamibahmanbeiglou, Pouyan

A56569533
Kulseth, Mckenzie Grace

A54322713
Lei, Cheyenne India



A54503462
Lin, Zihan

A48940437
Peter, Brad

A40892247
Snirkey, Gabriela E

A54422084
Stageberg, Marshall Sterling

A56480442
Wang, Yunao

A56494397
Zhang, Rui

Total Students: 10

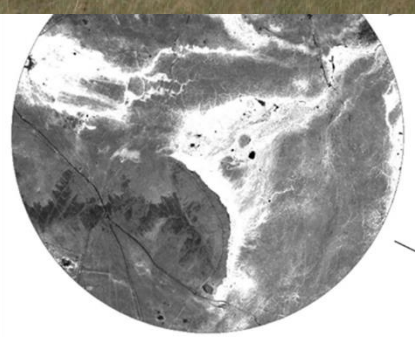
Goal: to update with the latest scientific endeavors in the frontiers in geospatial science through hands-on research experience

Objectives (for SS 2018):

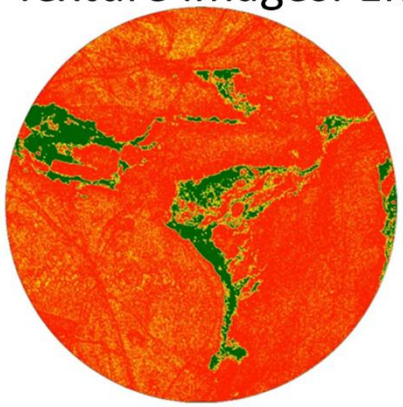
1) To develop sound scientific questions and hypothesis,
2) To perform the corresponding data analysis, and
3) To constructing a manuscript for publication

Task

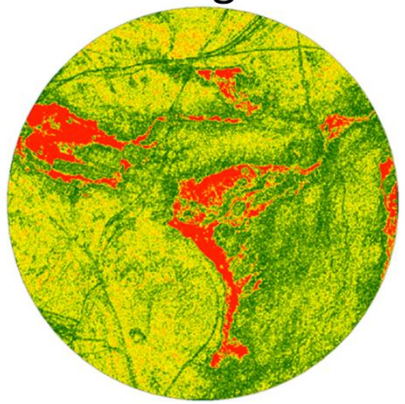
To examine the contributions of landscape heterogeneity to ecosystem carbon/water/energy fluxes. This will be done by integrating the long term flux measurements of the FLUXNET towers and various geospatial data (e.g., high resolution DEM, land cover, LAI, etc.).



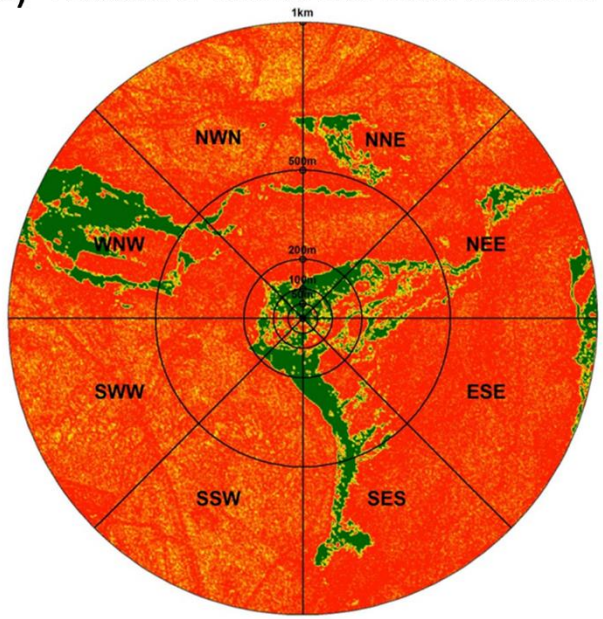
(b_1) Texture images: Entropy



(b_2) Texture images: Homogeneity

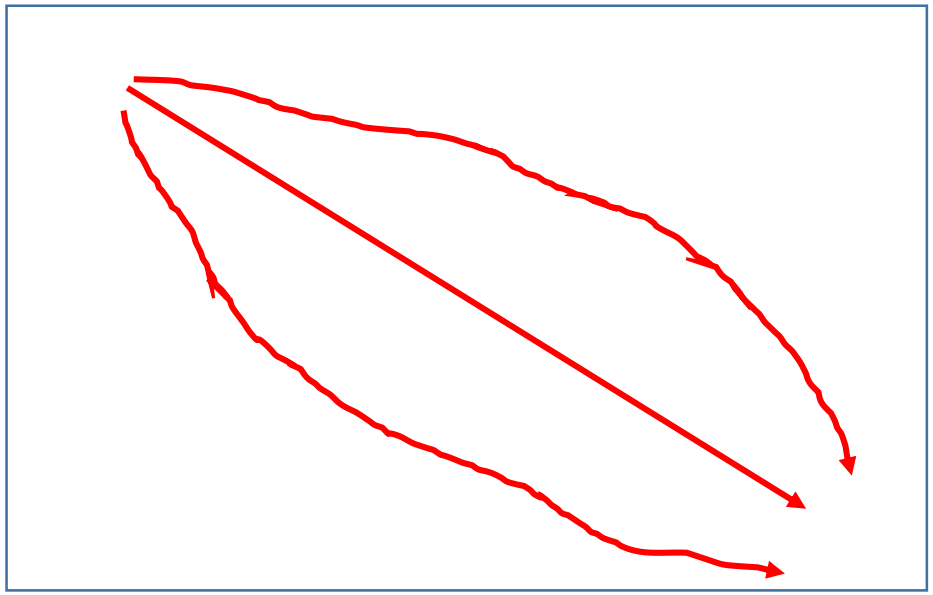


(c) Texture metrics extraction



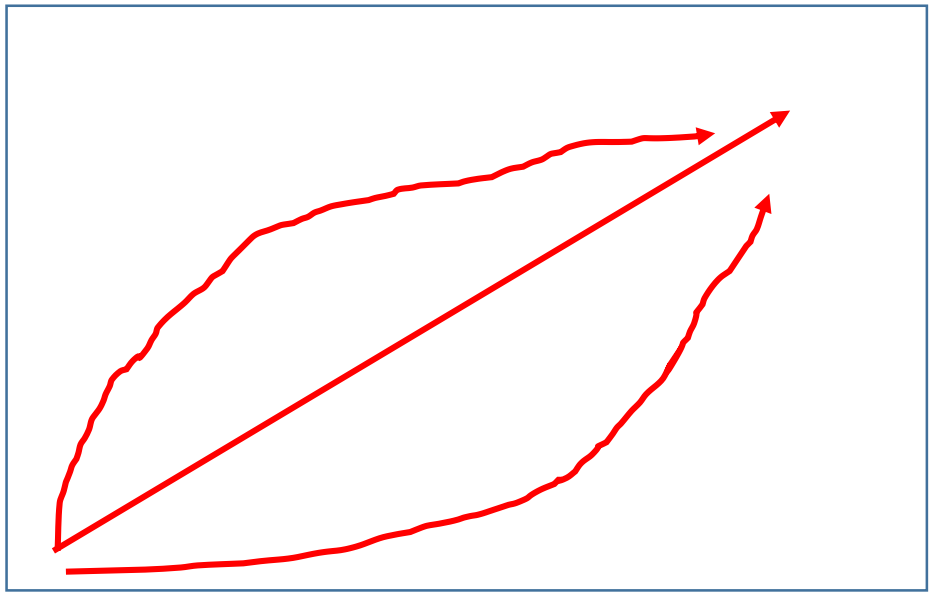
Tentative Hypotheses

H_1: Inter-annual variation



Landscape heterogeneity

H_2: Intra-annual variation



Landscape heterogeneity

Data Sources

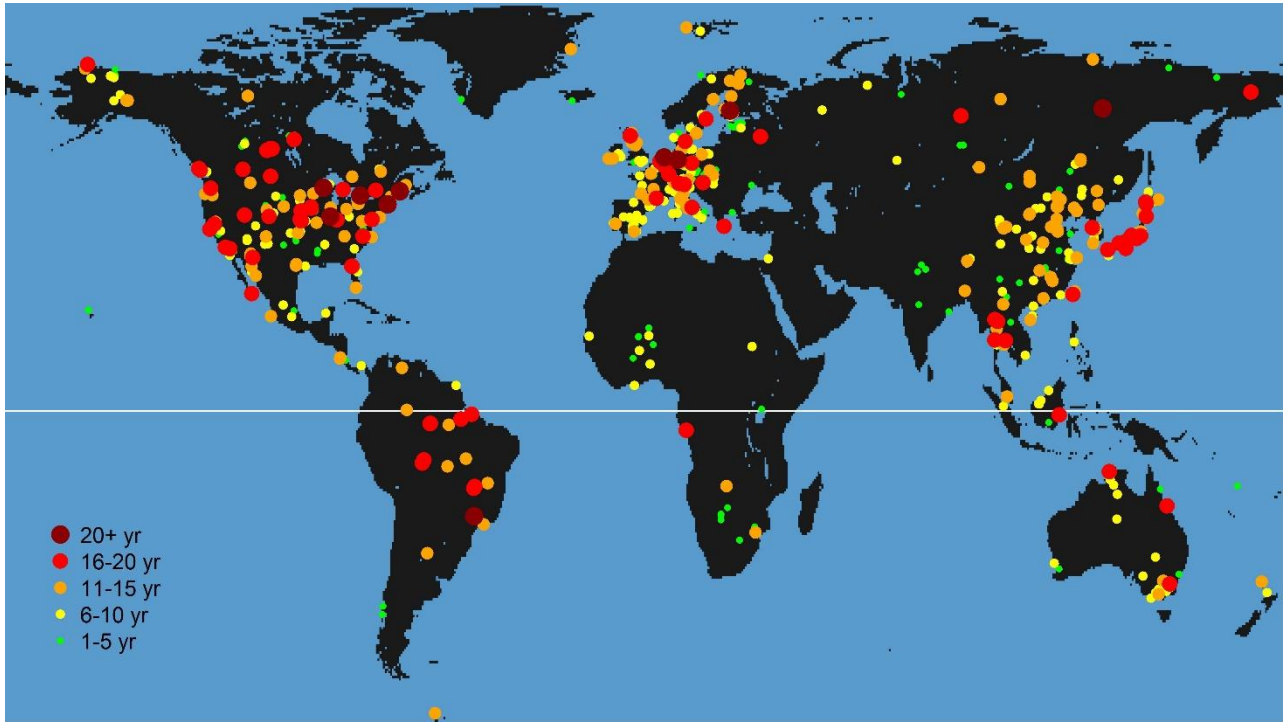
1) FLUXNET & AmeriFlux
2) 30-m DEM and a high resolution remote sensing images
3) We will focus on "Forest Sites"

FLUXNET2015 Dataset

The FLUXNET2015 Dataset includes data collected at sites from multiple regional flux networks. The preparation of this FLUXNET Dataset has been possible thanks only to the efforts of many scientists and technicians around the world and the coordination among teams from regional networks. The previous versions of FLUXNET Dataset releases are the FLUXNET Marconi Dataset (2000) and the FLUXNET LaThuile Dataset (2007). The FLUXNET2015 Dataset includes several improvements to the data quality control protocols and the data processing pipeline. Examples include close interaction with tower teams to improve data quality, new methods for uncertainty quantification, use of reanalysis data to fill long gaps of micrometeorological variable records, among others (see the data processing pipeline page for details). Refer to the Data Policy page for data usage and acknowledgement requirements.

Download FLUXNET2015 Dataset

(Dataset updated on November 3, 2016 — changes)



Note: Students will need to learn how to find these databases and down them to a shared folder.

Team Effort & Leaders

1) FLUX data & synthesis (Yuhao, Mckenzie -- David)
2) DEM & RS (Linda, Nafiseh -- Ranjeet)
3) Data analysis (Brad, Marshall -- Jiquan)
4) Manuscript development (Chenyenne, Garbiela --) for a professional journal (*e.g., Ag For Met; JGR-Biogeoscience; For Ecol Managem, etc.)*

Note: Every student is expected to participate in all tasks to assure his/her intellectual contributions, as well as the fairness!

Time Table

Week 16: Submission
Week 15: x
… (to be completed)

Class meeting in Manly Miles 105

Week 2: 2 -2.5 hours

- An introduction of EC data and access (Dr. David Reed)
- An introduction of geospatial databases (DEM & RS) (Dr. Ranjeet John)
- Team formation and deadlines (Dr. Jiquan Chen)
- Data storage (Google Docs -- Pouyan)
- Class Webpage to be lunched!

General Discussion:

Tentative teams (alphabetical list)

1) FLUX: Yuhao, Nafiseh, Cheyenne, Jiang, Rui, …
2) DEM&RS: Linda, Nafiseh, Piero, Brad, Pouyan, Jiang,…
3) Data Analysis: Brad, Marshall, Gabriela, Mckenzie, Yuhao, Pouyan, …
4) Writing: Cheyenne, Gabriela, Brad, McKenzie, …