

Geophysical Fields

Tu-Th 1:30-3:00, GI Auditorium

Jeff Freymueller

413B Elvey x7286

jeff@giseis.alaska.edu

Class Website

http://www.gps.alaska.edu/jeff/Classes/GEOS602_s10.html

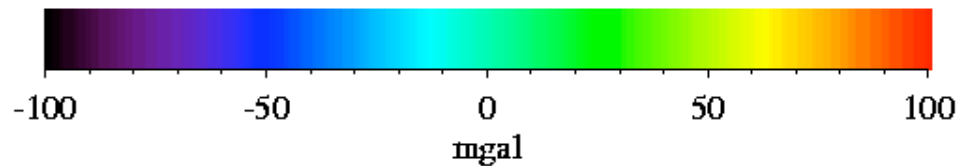
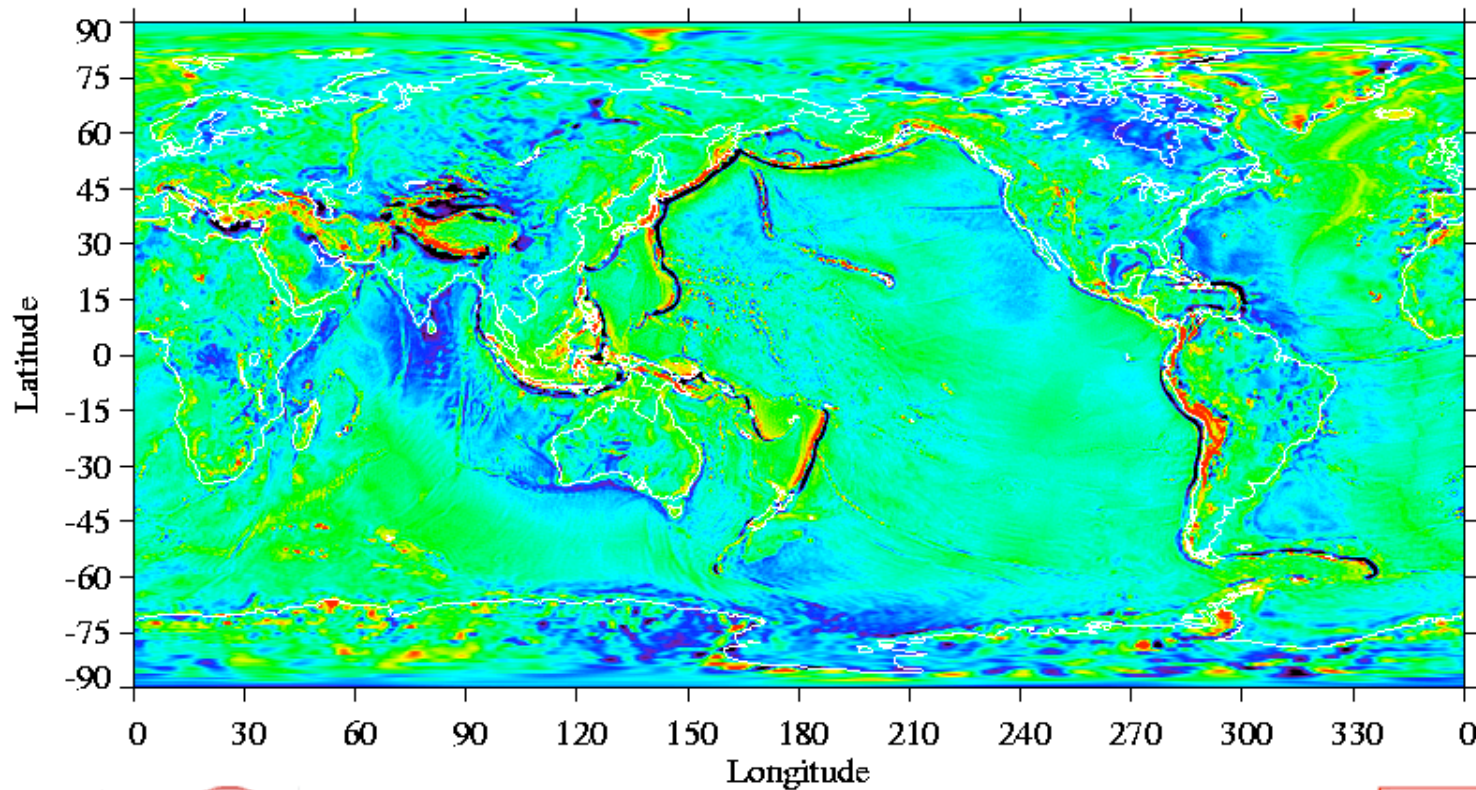
- Syllabus
- Homework Assignments
- Files to download
- Links
- *It's Under Construction...*

Goals

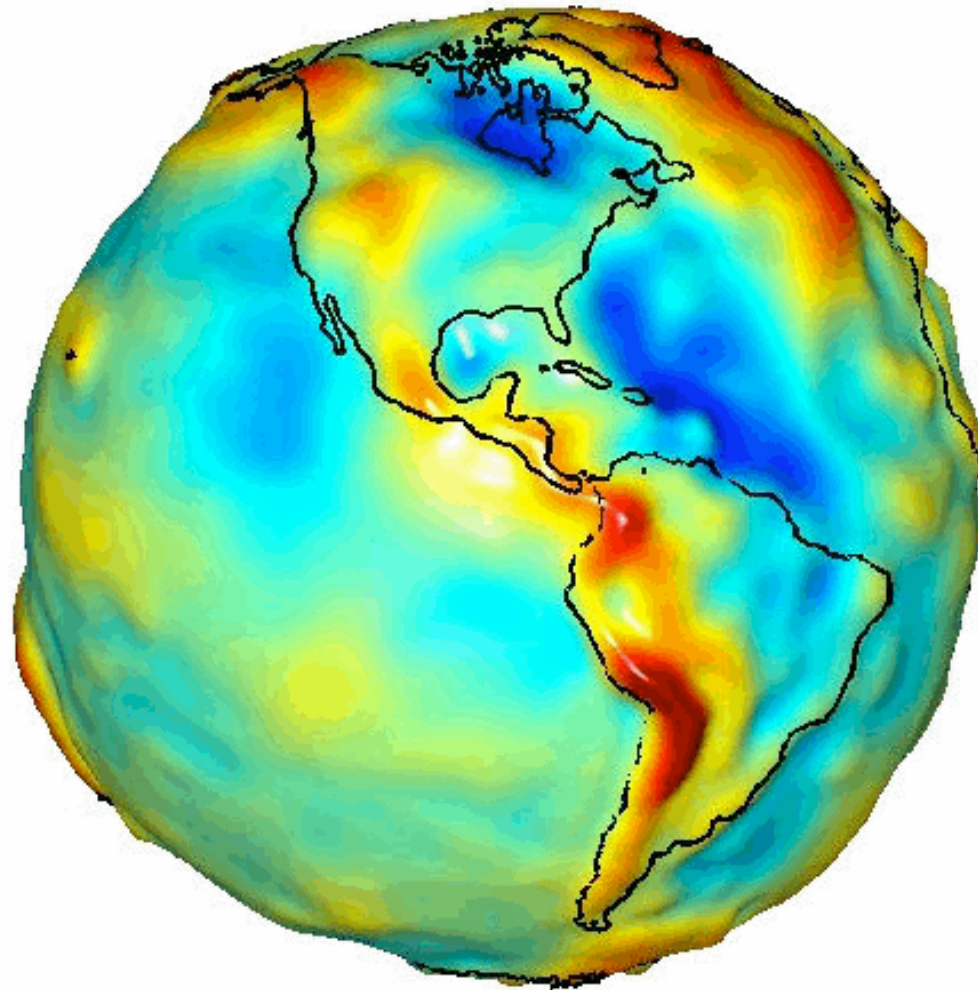
- Understanding of potential fields (gravity, magnetics) and temperature
 - Physics of gravity and magnetics
 - Earth's gravity and magnetic fields, including time variations
 - Shape of the earth and geoid
 - Isostasy and compensation
 - Magnetization
 - Paleomagnetism and the geodynamo
 - Physics of heat flow
 - Heat generation within the Earth and implications
 - A variety of heat transfer problems

Introduction to Global Geophysics

30' Mean Gravity Anomalies: EGM96 (Nmax=360)

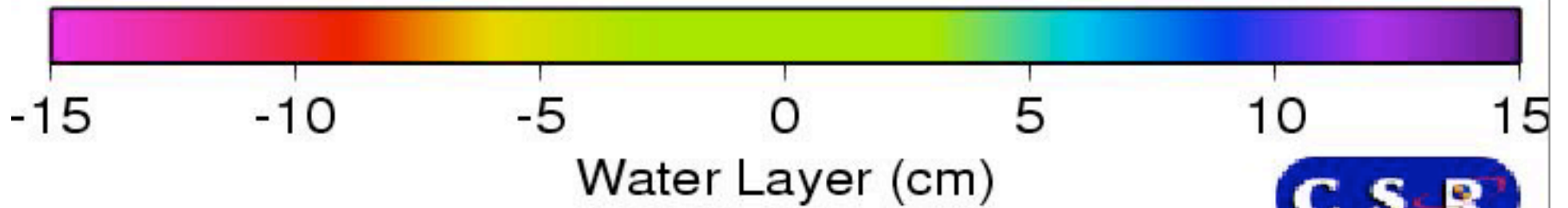
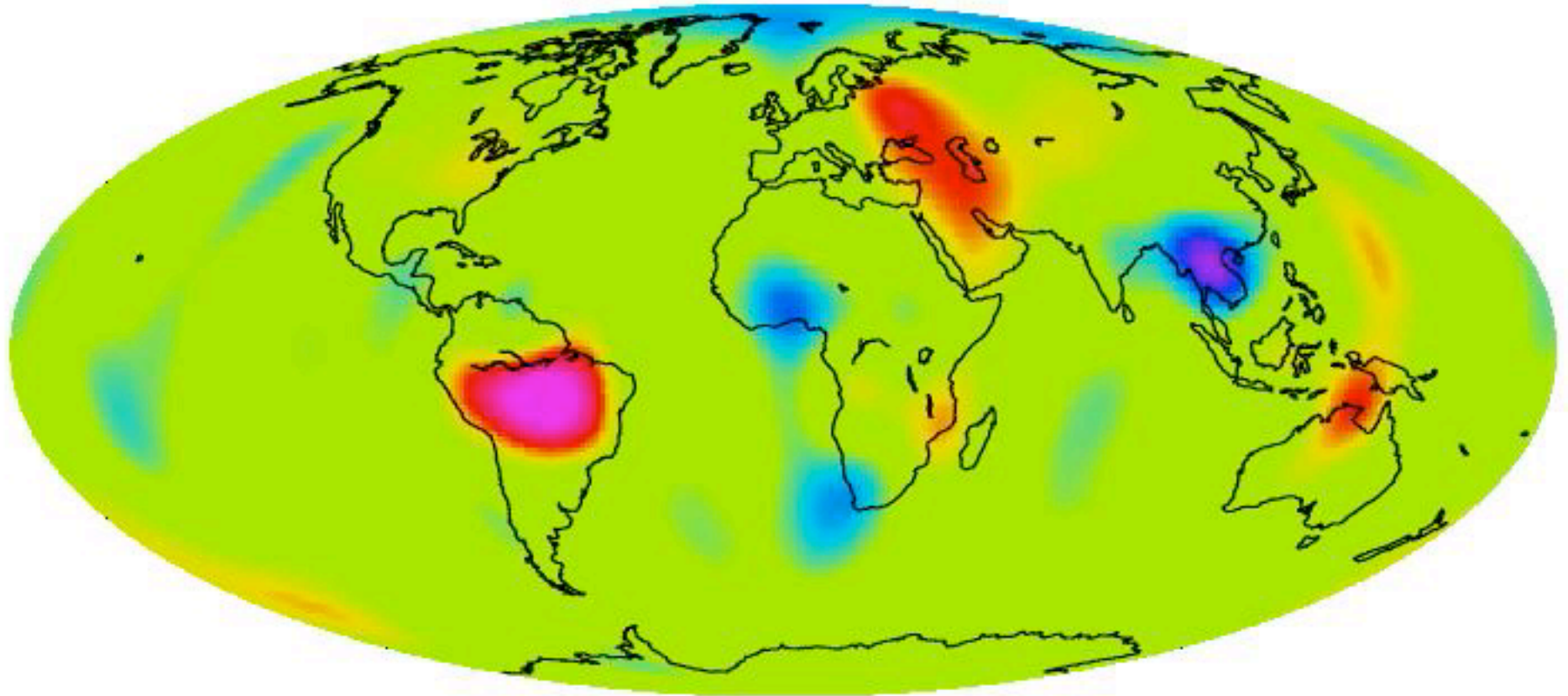


Geoid from GRACE

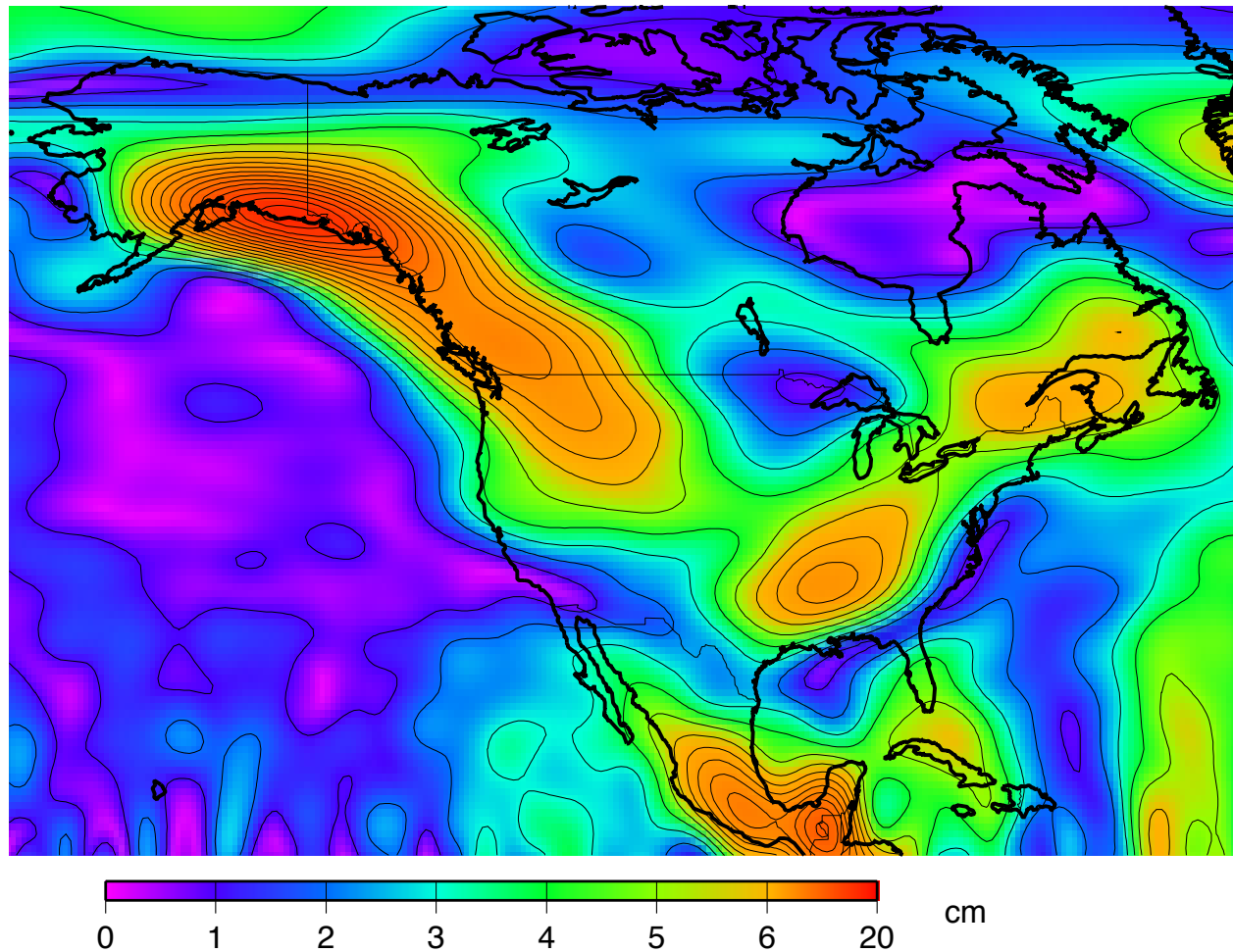


Gravity Change

SEP-17-2002



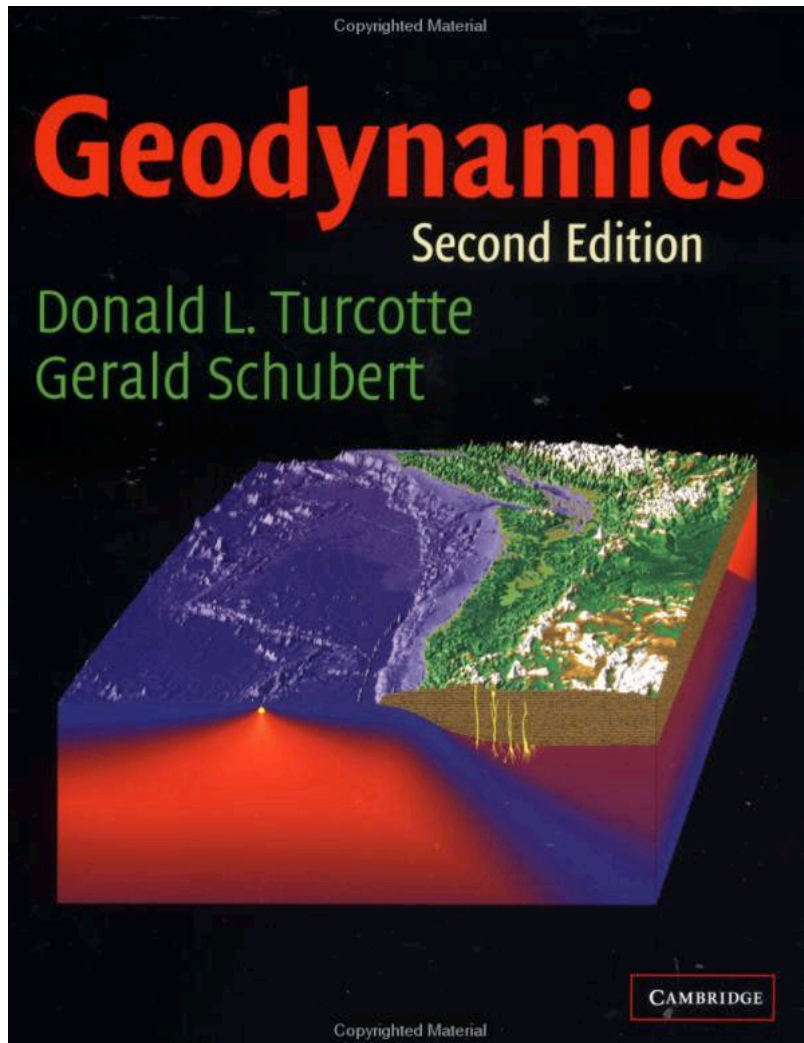
Seasonal (Annual) Gravity Change – water equivalent



Mathematical Tools

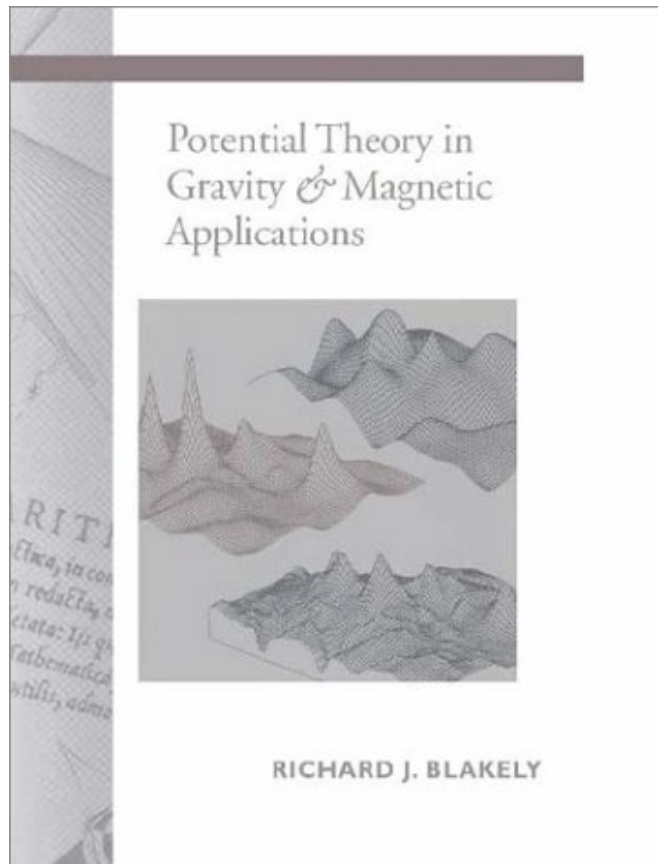
- Generalizing solutions to specific differential equations
- Orthogonal functions
- Spherical Harmonics
- Fourier Methods

Textbook



- Also used for the Geodynamics class
- Some changes in 2nd edition:
 - Gravity: Minor
 - Heat: Some significant
- A classic reference
- At the Bookstore or \$60 at [amazon.com](https://www.amazon.com)

Additional Material From...



- Blakely: an excellent reference, mathematically more advanced
- Lambeck: Geophysical Geodesy
- Other books
- Some new research

Course Grading

- Homework: 60%
 - Roughly 10 assignments
- Computational project: 40%
 - You select the topic
 - Must be relevant to class material
 - Independent of your thesis research
 - A short written report and a poster session