

Geog183: Cartographic Design and Geovisualization Spring Quarter 2020

Lecture 1: Scope of the class--GIMP and Inkscape fundamentals

Class Website:

<http://www.geog.ucsb.edu/~kclarke/Geography183/Geog183.html>

*** [Link here to student Assignments](#) ***

Class meets M W 3:30- 4:45 ELLSN 3621

<i>When</i>	<i>What</i>	<i>Listen</i>	<i>Read</i>
April 3rd	Lecture 1: Scope of the class-- GIMP and Inkscape fundamentals	Video Here	Read Manual Entries
April 5th	Lecture 2: The human vision system: vision, perception, cognition and behavior	Lecture Video here	Lecture Notes
April 10th	Lecture 3: Thematic cartography, geovisualization and visual analytics	Lecture Video here	Slocum Chapters 1, 2
April 12th	Lecture 4: A brief history of information graphics	Lecture Video here	Slocum Chapter 3
April 17th	Lecture 5: Choropleth and bivariate maps and classification	Lecture Video here	Slocum Chapters 4, 13, 18
April 19th	Lecture 6: Map types and Data types	Lecture Video here	Slocum Chapter 5
April 24th	Lecture 7: Color and its use	Lecture Video here	Slocum Chapter 10
April 26th	No Lecture	Catch up	
May 1st	Lecture 8: Toponymy, typography and map text	Lecture Audio here	Slocum Chapter 11
May 3rd	Lecture 9: Principles of map design and layout	Lecture Video here	Slocum Chapter 12
May 8th	Lecture 10: Production, Reproduction and Dissemination	Lecture Video here	Slocum Chapter 13
May 10th	Lecture 11: Dasymetric and isarithmic mapping	Lecture Video here	Slocum Chapters 15, 16
May 15th	Lecture 12: Point symbol and flow maps	Lecture Video here	Slocum Chapters 17, 19

Lectures

- Online, available from class website
- Lab will meet once a week-Fridays, online until further notice
- No mid-term, but keep up with text because there will be a final, there is one catch-up day
- Assignments will be critiqued and discussed as they come in during lecture
- First part of course is introduction, then will follow Slocum et al.'s course structure
- Use Gauchospace for discussion forum and messaging

Lab Website: Gauchospace

The screenshot shows a web browser window displaying the Gauchospace course page for GEOG 183 - CART DESIGN & GEOVI - Spring 2016. The browser's address bar shows the URL <https://gauchospace.ucsb.edu/courses/course/view.php?id=11781>. The page features a dark blue header with the Gauchospace logo and navigation links: MY HOME, ABOUT, COURSES, and HELP. The user's name, Keith Clarke, is visible in the top right corner.

The main content area is titled "GEOG 183 - CART DESIGN & GEOVI - Spring 2016" and includes a "Turn Editing On" button. A central graphic displays a map of the United States with a color-coded legend for "POPULAR VOTE" and the text "GEOG 183 Cartographic Design and Geovisualization". Below the map, the text reads: "Spring Quarter 2016: Professor Keith Clarke", "Contact: <http://www.geog.ucsb.edu/~kclarke>", "Office phone: 805-456-2827", "e-mail: kclarke@geog.ucsb.edu", "Office: 1720 Ellison Hall", "Office Hours: Tuesday 10:00am-12:00pm", and "Last modified: 3/21/2016". A link for "Instructor Announcements" is also present.

The page is organized into several sidebars:

- ACTIVITIES:** Assignments, Forums, Resources.
- ADMINISTRATION:** Course Administration (Turn Editing On, Edit Settings, Users, Filters, Reports, Grades, Gradebook Setup, Backup, Restore, Import, Question Bank, Recycle Bin), and Switch Role To...
- UCSB COURSE TOOL:** Welcome Message, Course Rosters, Add User/Assign Roles, Course Analytics.
- PEACHMAIL:** Compose New Email, View Drafts, View History.
- NAVIGATION:** My Home, Site Home, My Profile, Current Course (GEOG 183 - S16), Participants, My Courses.

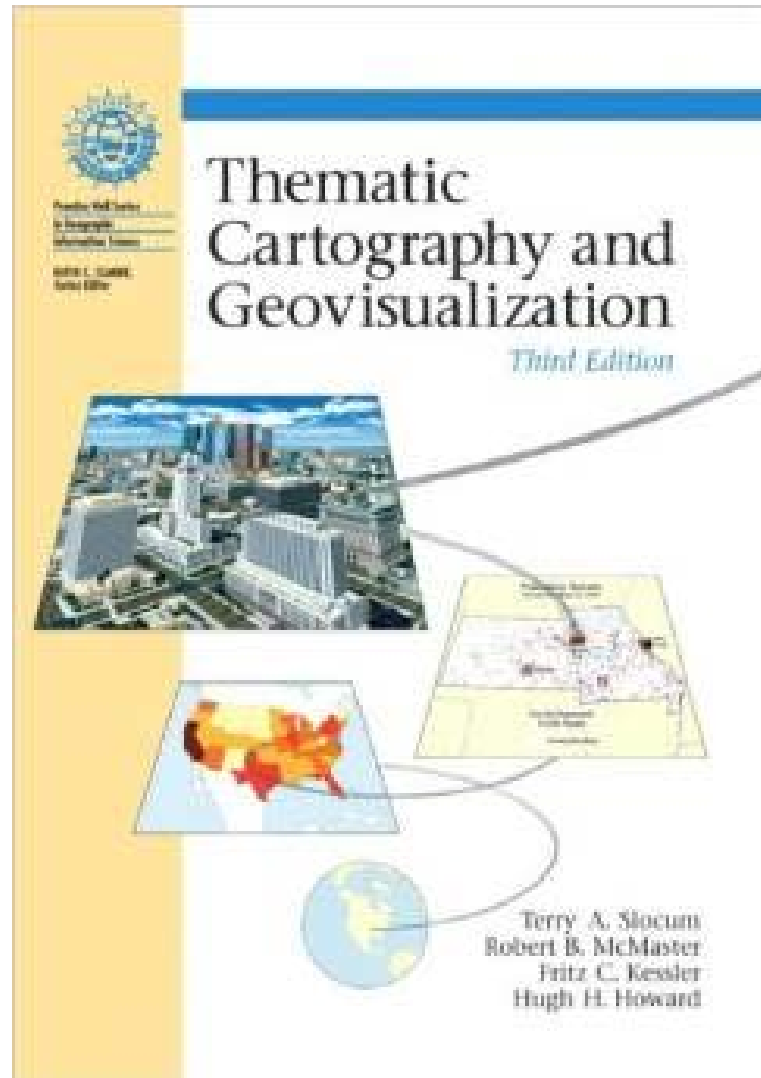
At the bottom of the page, a section titled "March 28 - April 3" contains a link for "Week 1". The Windows taskbar at the bottom shows the system clock as 11:02 AM on 3/21/2016.

Labs

- Will meet virtually until further notice, then in the Descartes Lab Ellison 3620
- TA is Matthew Feliciano
- Office Hours: TBA email: feliciano@ucsb.edu
- That leaves 8 weeks, so we will do 5 assignments plus a project
- Labs 1-5 will count for 10% of grade, project for 30%
- Final Exam will count for 20% of the grade, short answer questions
- Examples are posted on the class website



Slocum et al. 3ed. 2008, but a classic
Web content via MyGeoSciencePlace at Pearson



Lectures and Topics Weeks 1-5

- Lecture 1: Scope of the class-- GIMP and Inkscape fundamentals
- Lecture 2: The human vision system: vision, perception, cognition and behavior
- Lecture 3: Thematic cartography, geovisualization and visual analytics
- Lecture 4: A brief history of information graphics
- Lecture 5: Choropleth and bivariate maps and classification
- Lecture 6: Map types and Data types
- Lecture 7: Color and its use
- Lecture 8: Toponymy, typography and map text
- Lecture 9: Principles of map design and layout
- Lecture 10: Production, Reproduction and Dissemination

Lectures and Topics Weeks 6-10

- Lecture 11: Dasymetric and isarithmic mapping
- Lecture 12: Point symbol and flow maps
- Lecture 13: Map animation
- Lecture 14: Visual analytics and data exploration
- Lecture 15: Dealing with uncertainty
- No Lecture (Memorial Day)
- Lecture 16: Web-based cartography
- Lecture 17: Cartography in virtual environments
- Lecture 18: Research in cartography and visualization and class summary
- Final exam

Learning Goals for Geog 183

1. Understand and implement principles of good design in cartography
2. Understand human vision and how it influences perception and cognition
3. Become familiar with using open source tools to improve the visual quality of web-based and other maps
4. Cover the scope of contemporary thematic cartography and web mapping
5. Gain hands-on experience in designing and improving web based maps
6. Master skills that will transfer to a host of other classes and to life beyond UCSB

I expect you to:

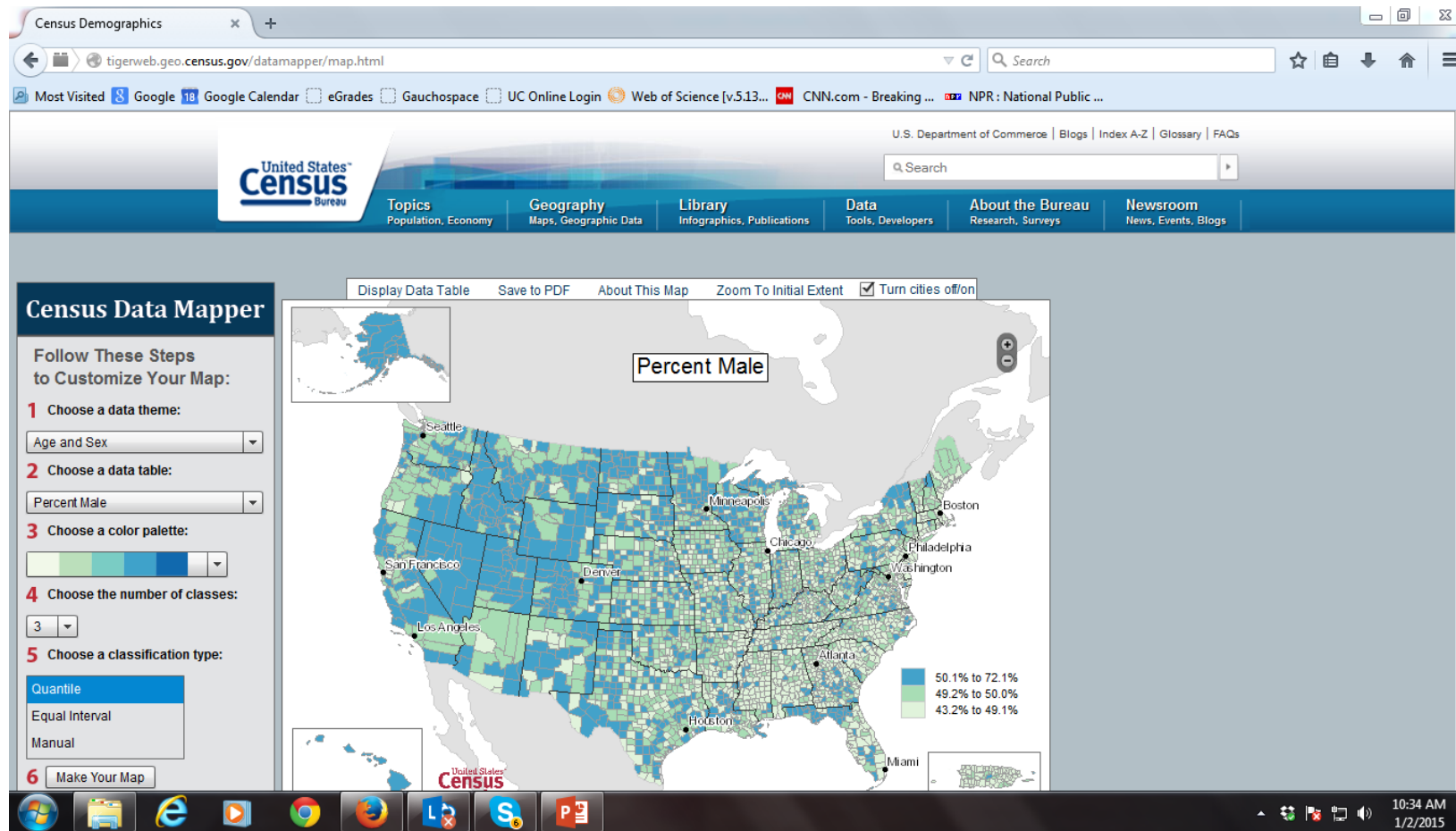
- Read the text
- Come to lecture (or watch the videos)
- Attend/watch the labs (esp. important when labs are introduced)
- Submit assignments on time
- Use Gauchospace
- Follow the UCSB Code of Student Conduct
<http://www.sa.ucsb.edu/regulations/students/student-conduct>
- Ask questions
- Have fun learning new material

Consider....

- Using web and other software mapping tools, almost any idiot (or bot) can create a map
- It takes knowledge and skill to create a **good** map
- It takes experience, skill, creativity and hard work to create a **great** map
- Fortunately, maps can be sequentially improved
- Good design follows known principles, and uses cartographic methods correctly
- Usually employs user centered design
- Same goes for much of graphic design, information graphics etc.

For example, Census Data Mapper

<http://tigerweb.geo.census.gov/datamapper/map.html>



Why open source tools?

- Powerful set of tools for mapping
- Price is right!
- Continuous improvements
- Available across platforms and OSs
- Get lots of cool additions and refinements
- Can use them on almost any computer
- Break down into raster and vector for mapping
- Raster – Photoshop – GIMP
- Vector – Illustrator – Inkscape

We will use many other tools as well...

- Will start with Quantum GIS
- Adobe Acrobat and PDF as display tools
- Will cover some basics of Leaflet and Java scripting
- For project, you can use any tool you wish
- Files will be bigger, resolutions higher than you may have used in the past
- Goal is to simulate the web and print publishing requirements
- Last assignment before project uses R-Studio and Shiny for interactive web design

GIMP



- GIMP (GNU Image Manipulation Program) is a free and open-source raster graphics editor used for image retouching and editing, free-form drawing, resizing, cropping, photo-montages, converting between different image formats, and more specialized tasks.
- GIMP is released under LGPLv3 and GPLv3+ licenses and is available for Linux, OS X, and Windows
- Original author(s) Spencer Kimball, Peter Mattis and the GIMP Development Team, originally a one-semester project at UCB
- Initial release January 1996, now 20 years old!
- Most recent Stable release 2.8.20 (2017-02-01)
- Development status: Active, API is a set of callable libraries
- Written in C, GTK+
- Web site: www.gimp.org

Capabilities

- image retouching and editing
- free-form drawing
- resizing and image density change
- cropping
- photo-montages
- converting between different image formats
- support for layers and transparency
- “magic” lasso and other neat tools
- full interactive online manual

Website



The screenshot shows a web browser window displaying the official GIMP website. The browser's address bar shows the URL <https://www.gimp.org>. The website's navigation menu includes links for GIMP, DOWNLOAD, NEWS, ABOUT, DOCS, PARTICIPATE, TUTORIALS, and DONATE. The main banner features the GIMP logo (a cartoon cat with a paintbrush) and the text "GNU IMAGE MANIPULATION PROGRAM". Below the banner, there are two buttons: "DOWNLOAD 2.8.20" and "RELEASE NOTES".

The Free & Open Source Image Editor

This is the official website of the GNU Image Manipulation Program (GIMP).

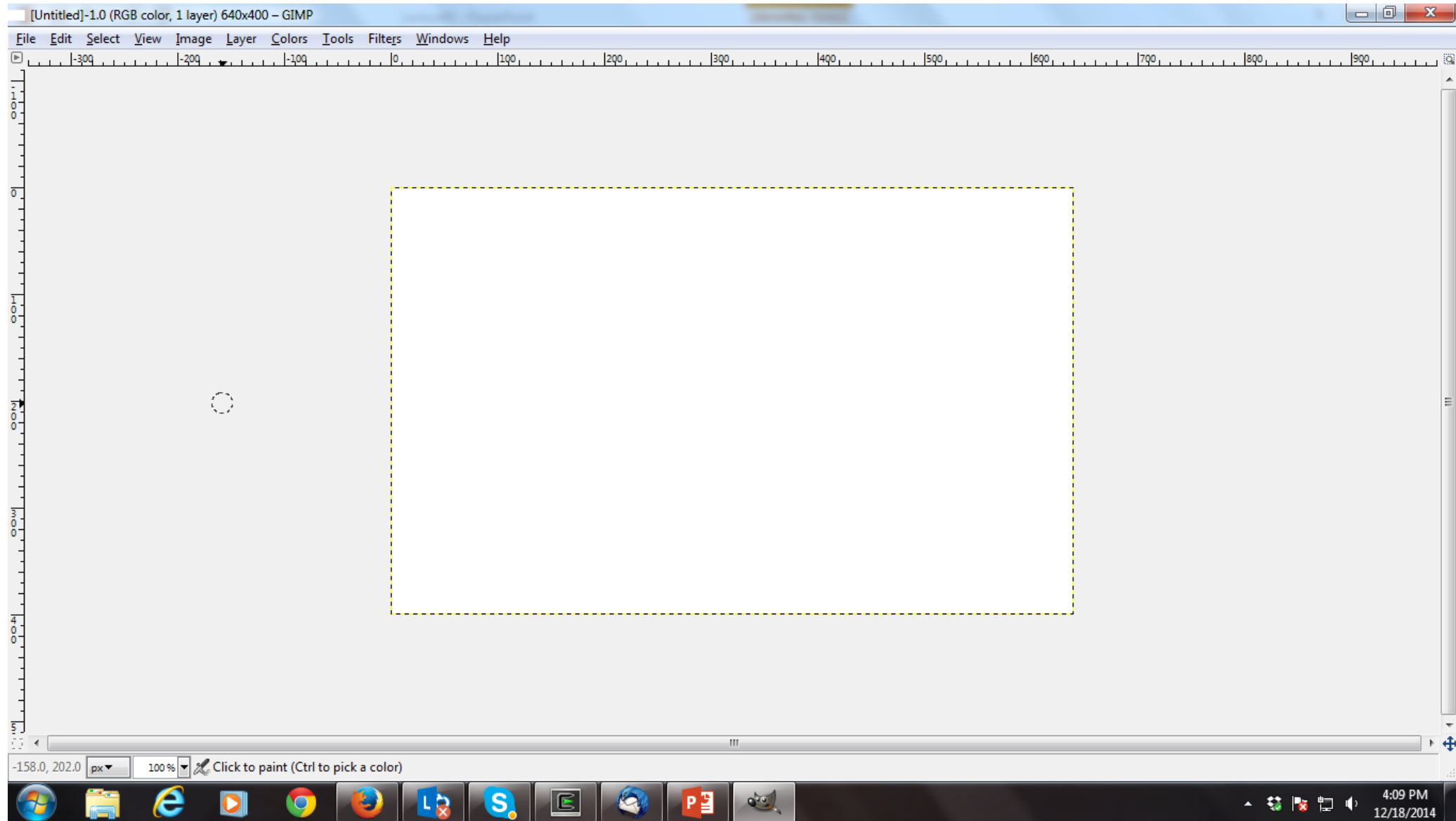
GIMP is a cross-platform image editor available for GNU/Linux, OS X, Windows and more operating systems. It is free software, you can change its source code and distribute your changes.

Recent News

- [An Interview with Michael Natterer, GIMP maintainer](#)
2017-03-01
- [GIMP 2.8.20 Packages for macOS and Microsoft Windows are available](#)
2017-02-07


The browser's taskbar at the bottom shows various application icons, including Windows, Edge, File Explorer, Home, Internet Explorer, VLC, GIMP, Photoshop, and Skype. The system tray on the right indicates the time is 1:38 PM on 4/3/2017.

GUI: Canvas and View control



GNOME GIMP

Soubor Rozř. Nápověda



Ořiznout

- Pouze aktuální vrstva
- Rozšiřovat ze středu
- Pevný poměr stran

1:1

Zvýraznění

X: 156

Y: 57

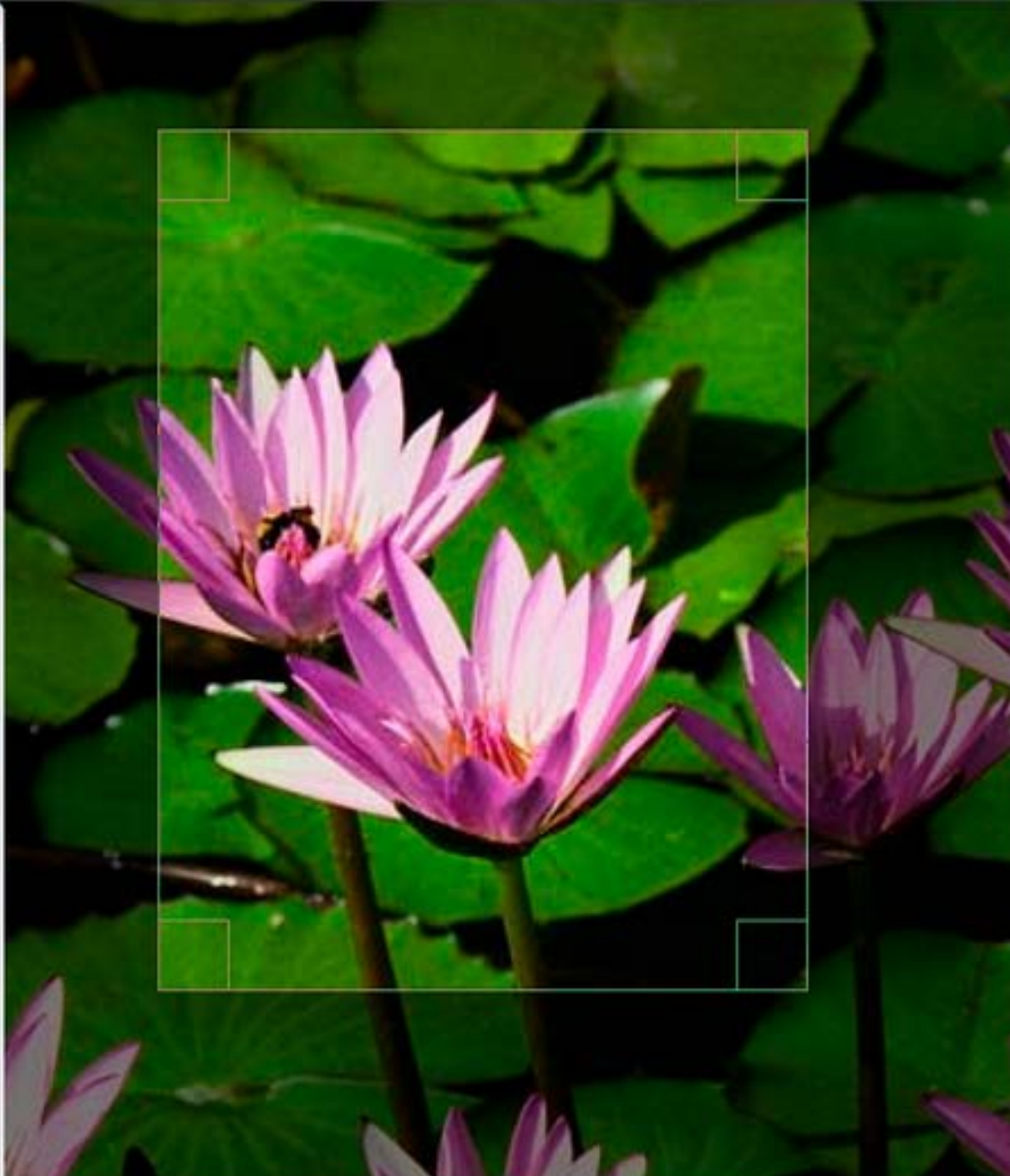
Šířka: 228 Pevně

Výška: 302 Pevně

Žádná vodítka

Automaticky zmenšit výběr

Zmenšit sloučené



Vrstvy, Kanály, Cesty, ...

Lekniny.jpg-1 Automaticky



Vrstvy

Režim: Normální

Krytí: 100,0

Zamknout:

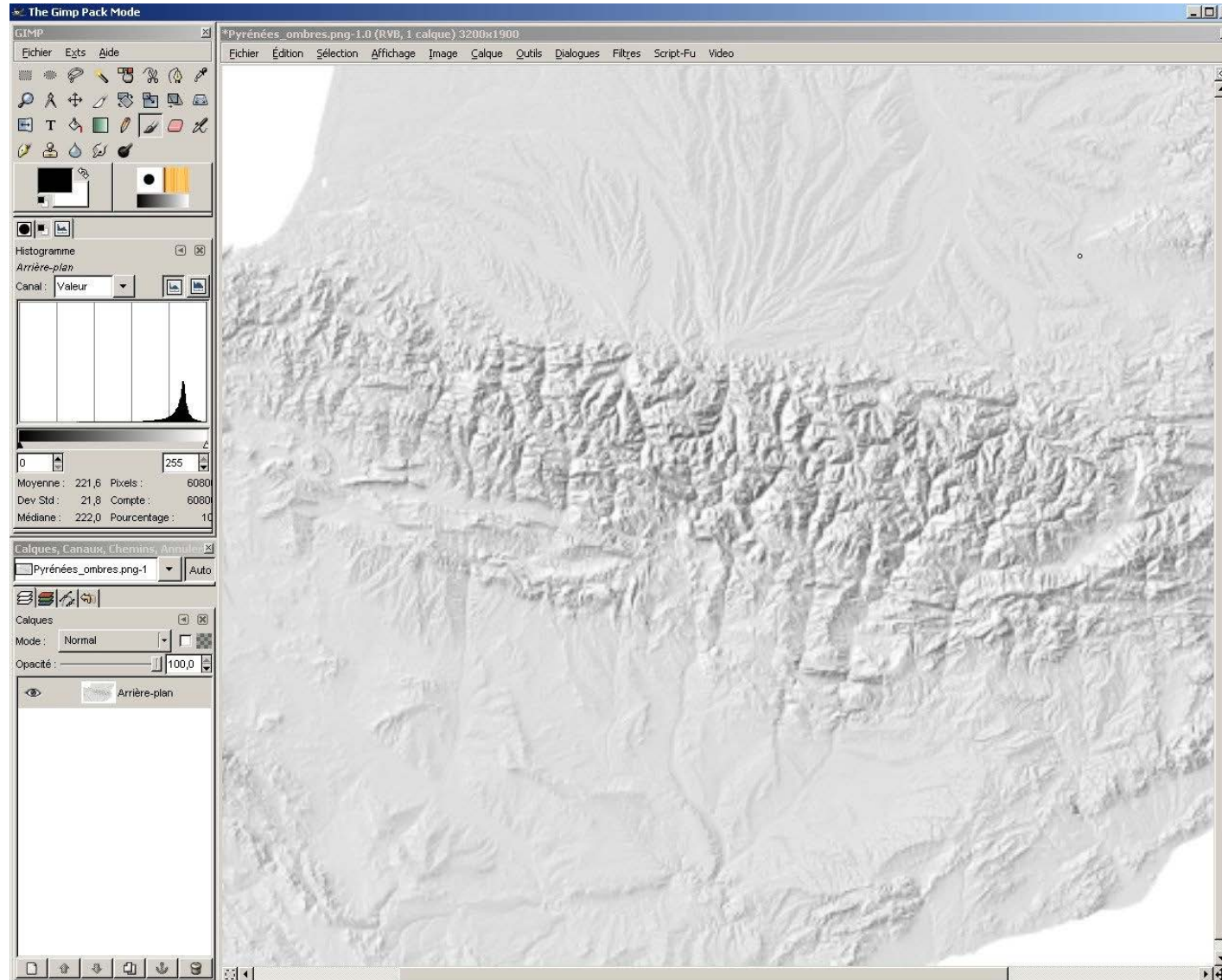
Pozadí

Barva popředí/pozadí

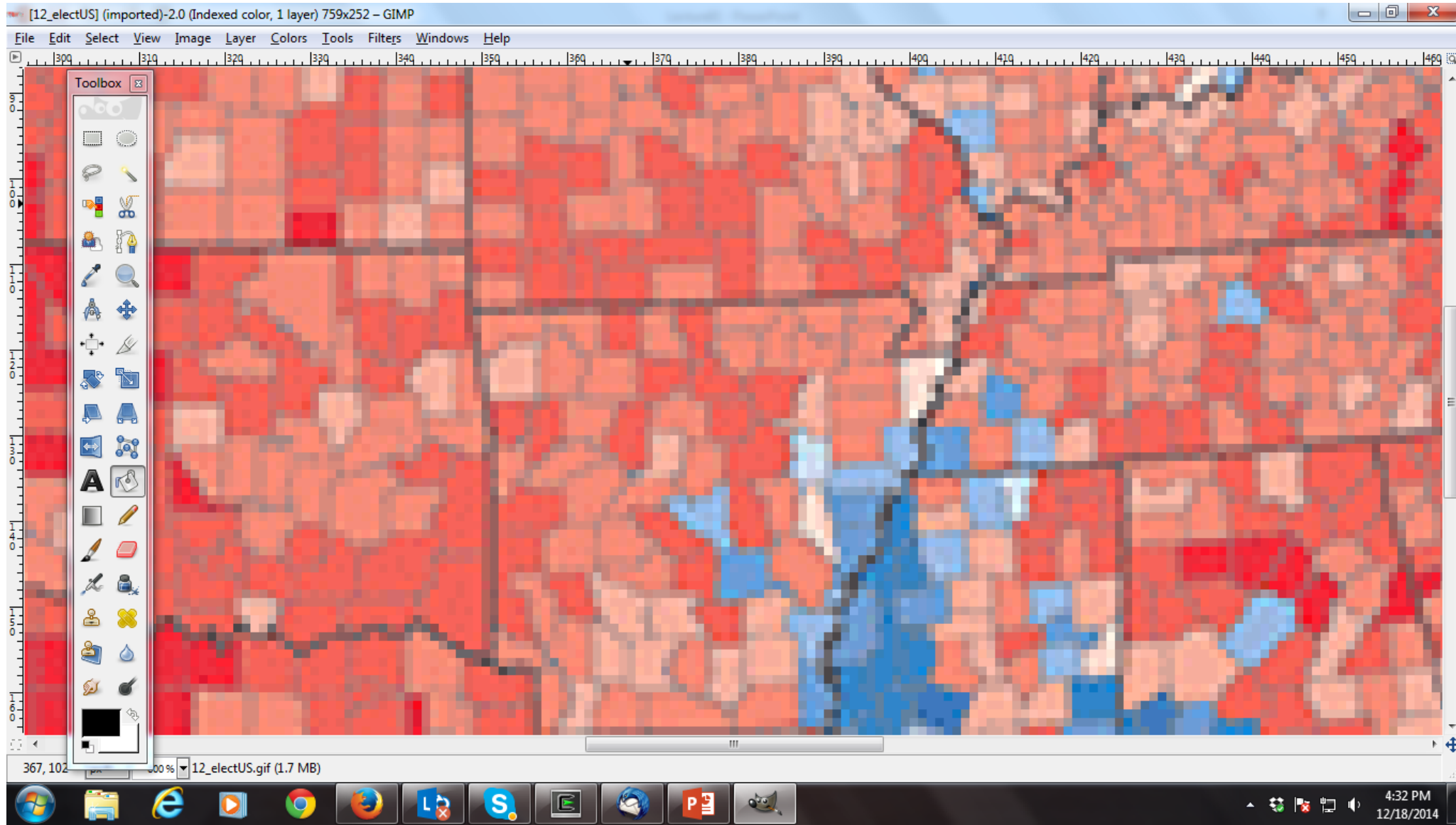


000000

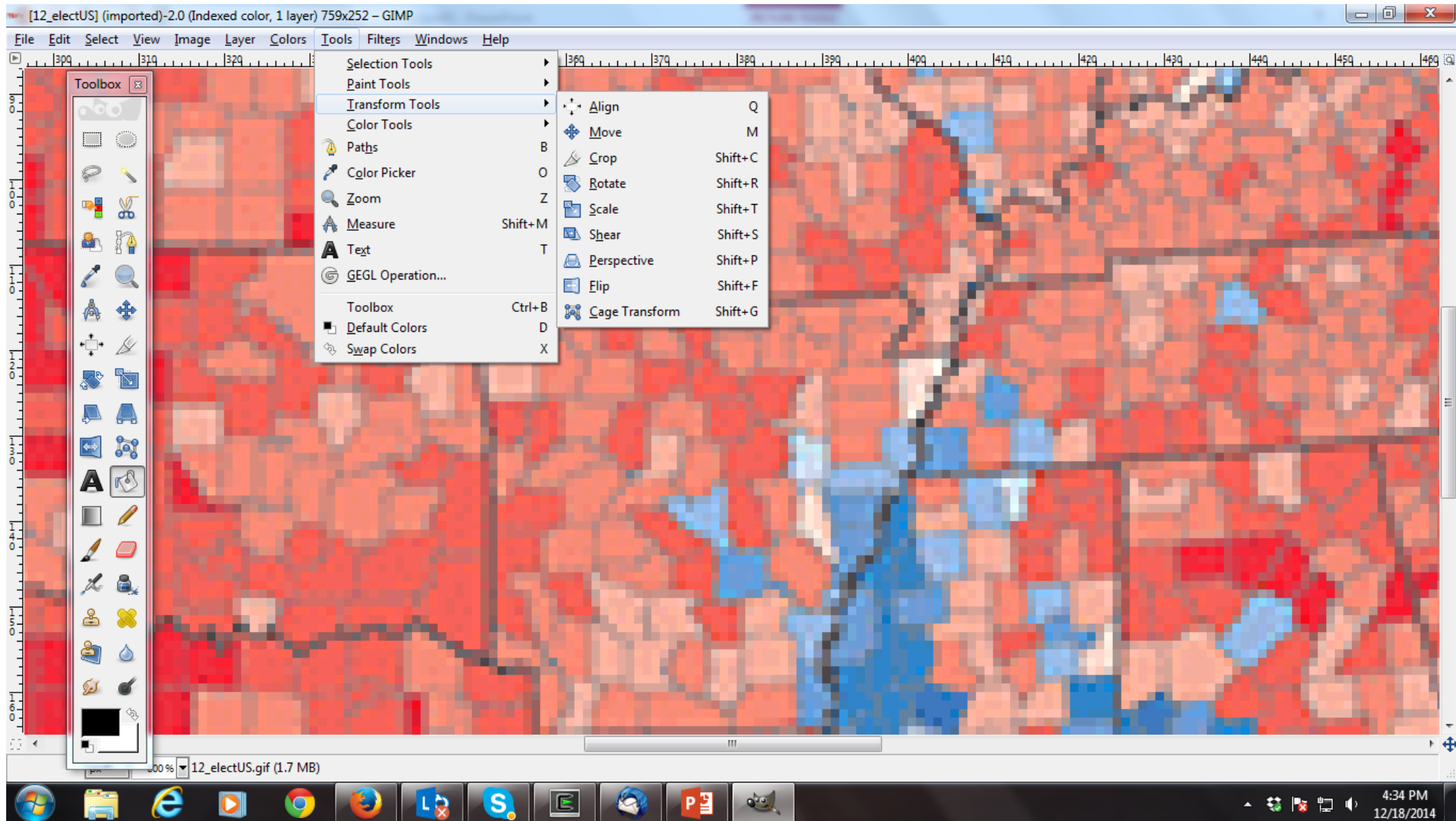
Cartography with Gimp



Toolbars, toolsets and functions



Pullright selection



Inkscape



- free and open source software vector graphics editor
- goal is to implement full support for the Scalable Vector Graphics (SVG) 1.1 standard.
- also supports various other formats for Import/Export
- The word Inkscape is a compound of the words ink and scape
- Inkscape is cross-platform and runs on OS X, Unix-like operating systems, and Microsoft Windows
- Inkscape began in 2003 as a code fork of the Sodipodi project. Sodipodi, developed since 1999, was itself based on Raph Levien's Gill (Gnome Illustration Application)
- The fork was led by a team of four former Sodipodi who focused on implementing the complete SVG standard, whereas Sodipodi development emphasized creating a general-purpose vector graphics editor, possibly at the expense of SVG
- Inkscape's new developers changed it greatly: They rewrote it from C into C++; adopted the GTK+ toolkit C++ bindings (gtkmm); redesigned its user interface, and added a number of new features
- implementation of the SVG standard, although incomplete, has shown gradual improvement

Capabilities

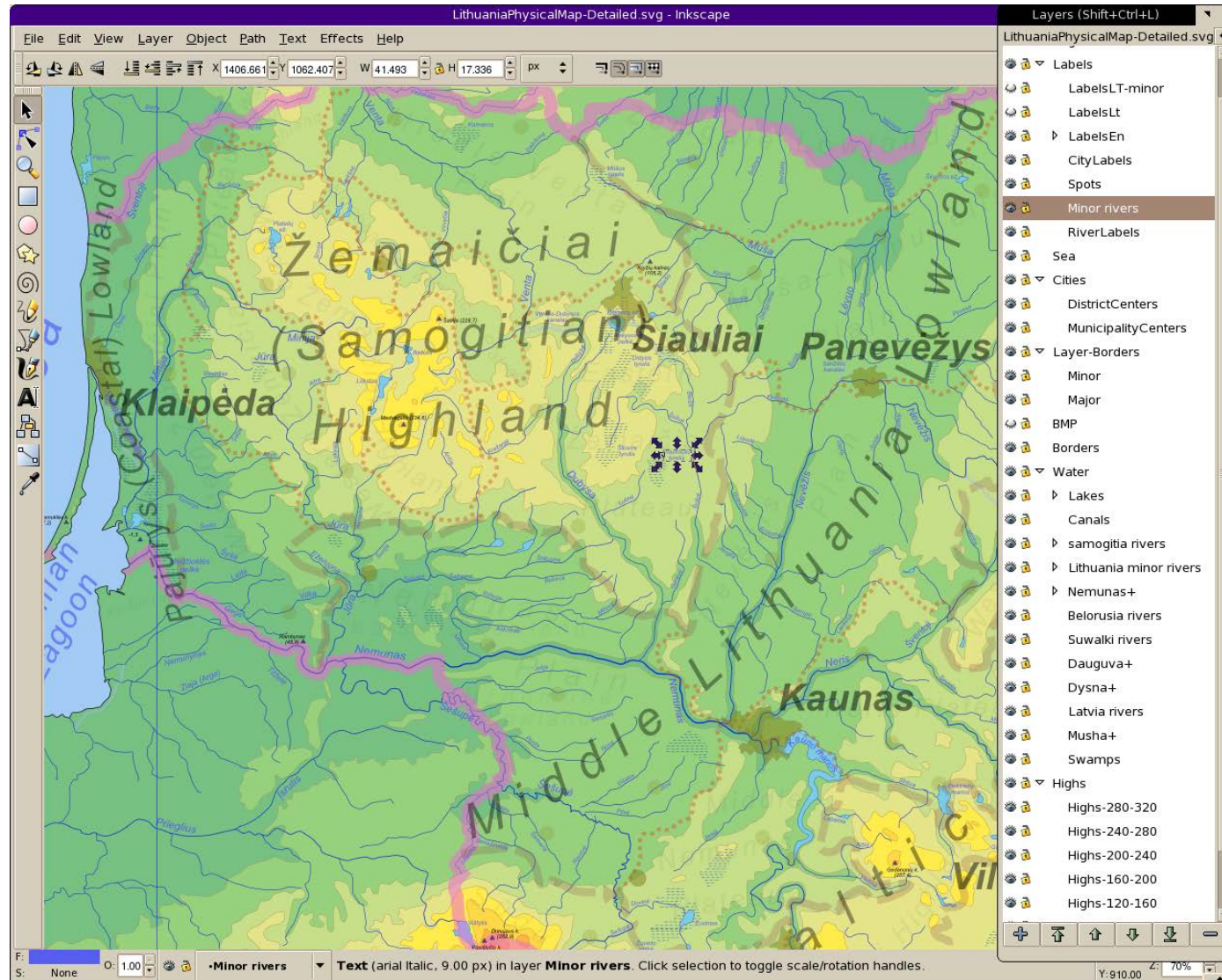


- Native SVG support, raw2 data files can be opened with a web browser
- Import and conversion for many vector formats, e.g. ESRI shape files
- Object creation
- Object manipulation
- Fill and stroke
- Operations on paths
- Text support
- Rendering
- Misc, including export to many formats and conversion to raster

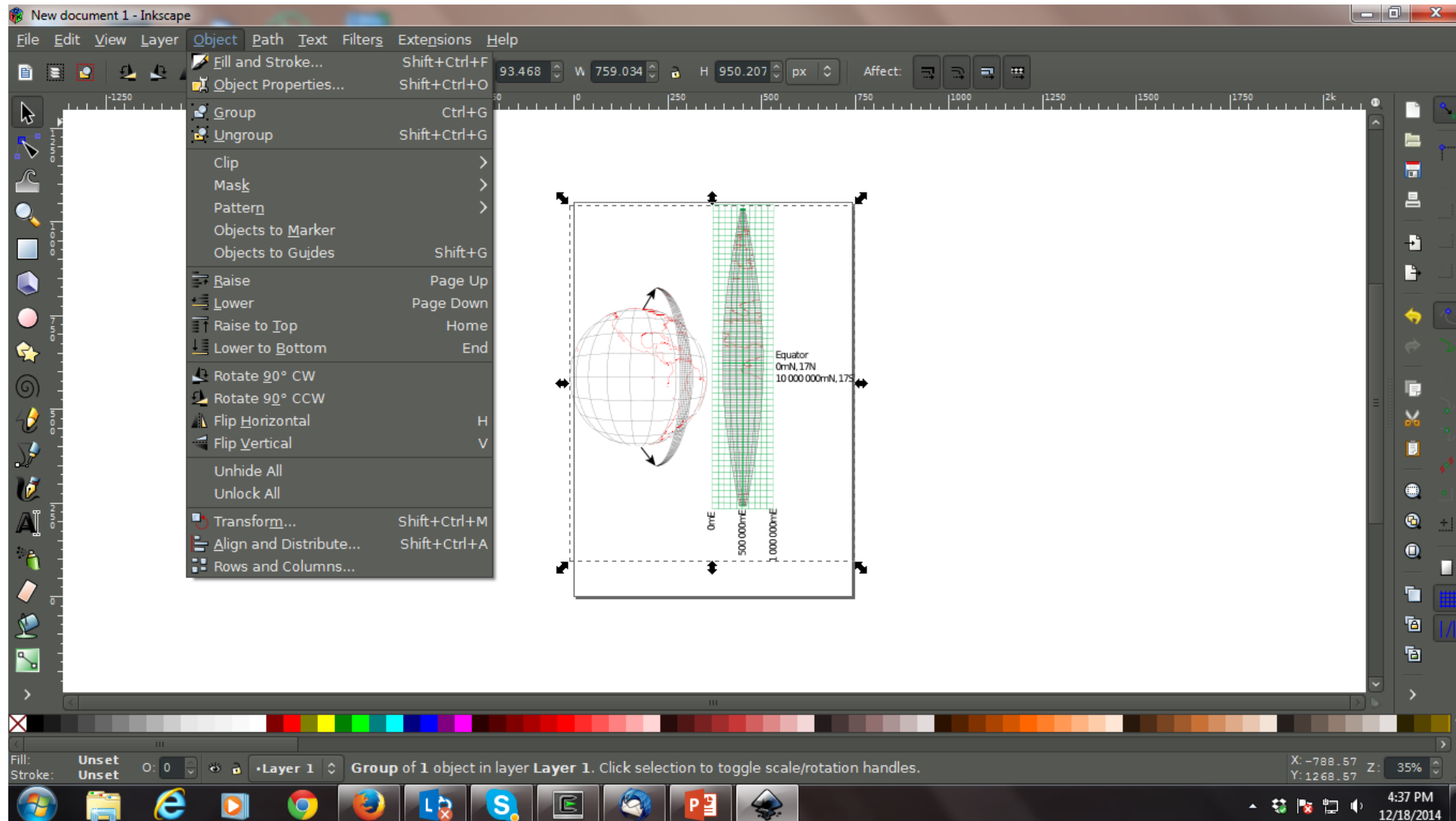
www.inkscape.org

The image shows a screenshot of the Inkscape website homepage as seen in a web browser. The browser's address bar shows the URL <https://inkscape.org/en/>. The website features a dark navigation bar with links for [English](#), [Log in](#), and [Register](#). The main header includes the Inkscape logo and the tagline "Draw Freely.", along with a search bar. Below this is a secondary navigation bar with links for [ABOUT](#), [DOWNLOAD](#), [NEWS](#), [COMMUNITY](#), [LEARN](#), [CONTRIBUTE](#), [DEVELOP](#), and [SUPPORT US](#). The central content area features a large graphic of a hand holding a pen, with a text box stating: "Inkscape is a professional vector graphics editor for Windows, Mac OS X and Linux. It's free and open source." Below this text is a "Download" button with a green arrow icon and the text "Current stable version: 0.92.1". To the left of the main graphic, the Inkscape logo and "INKSCAPE 0.92 Draw Freely" are displayed. At the bottom of the main content area, there is a section titled "Inkdrop Diffusion in Water by artelnjeru01". Below the main content is a dark navigation bar with four sections: "Overview" (What is Inkscape and how can I get it?), "Features" (Find out what Inkscape is capable of), "Gallery" (Showcase of creations from the community), and "Learning Resources" (Resources to help you get the most out of Inkscape). At the very bottom, there are three light gray boxes labeled "Users", "Developers", and "Recent News". The Windows taskbar is visible at the bottom of the screen, showing the time as 1:39 PM on 4/3/2017.

Inkscape cartography



Pullrights, import, group and ungroup objects



Reads SVG and PDF files as native

A Gallery of Map Project x

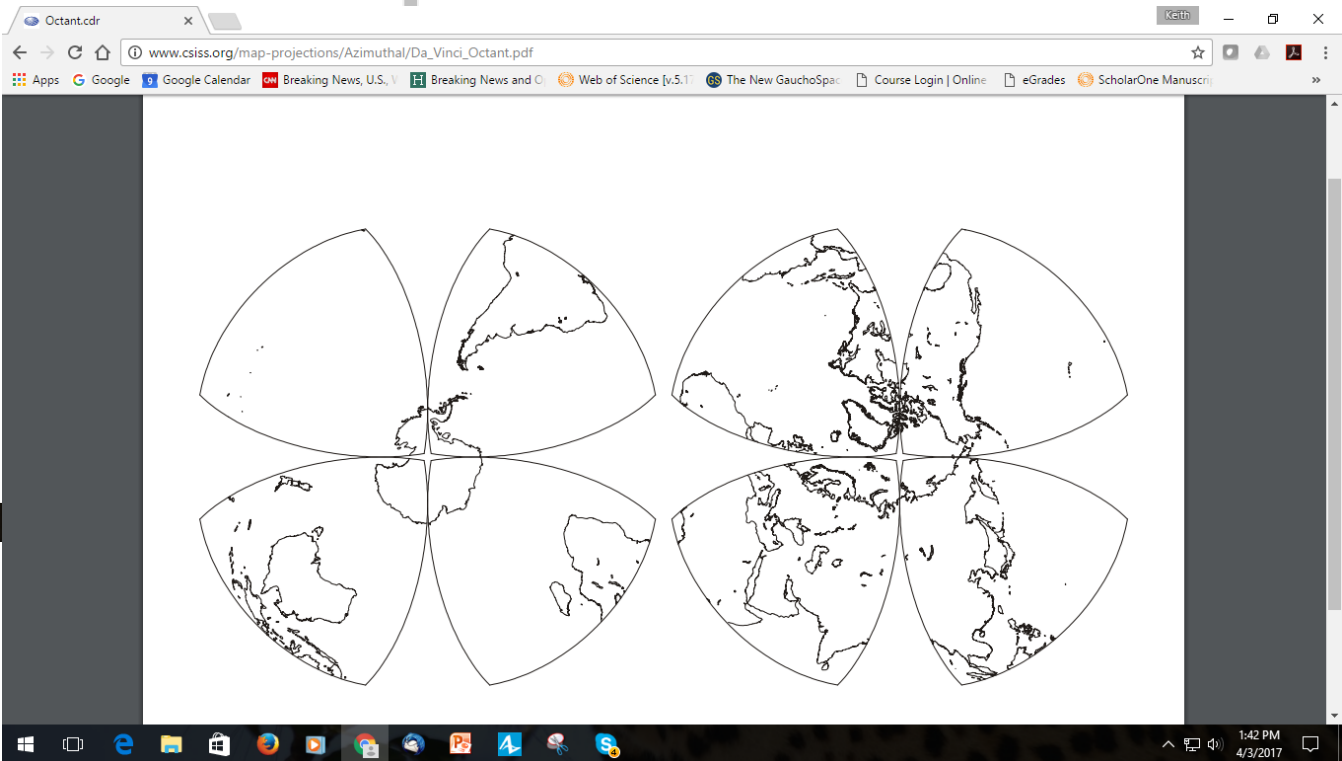
www.cssiss.org/map-projections/Azimuthal.html

Azimuthals and Related

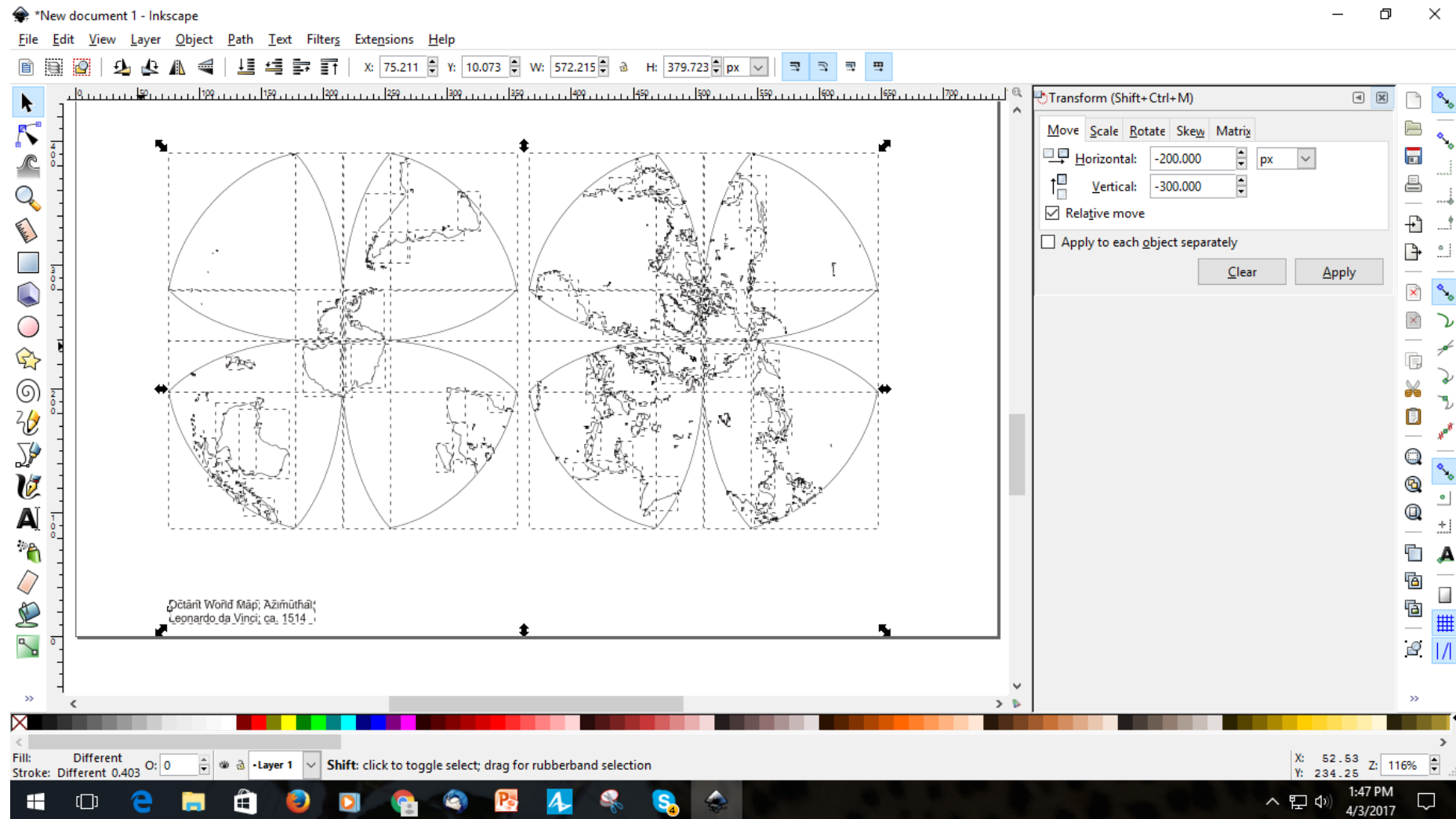
1. [Airy Minimum-error Azimuthal](#)
2. [Aitoff projection](#)
3. [Aitoff projection \(Interrupted for Continental Unities\)](#)
4. [Azimuthal Equidistant projection](#)
5. [Azimuthal Equidistant projection \(Polar Aspect\)](#)
6. [Berghaus Star](#)
7. [Bomford's projection](#)
8. [Breusing Geometric Mean](#)
9. [Breusing Harmonic Mean](#)
10. [Bresemeister projection](#)
11. [Chamberlin Trimetric projection](#)
12. [Clarke's Twilight Perspective projection](#)
13. [Craig's Mecca Map](#)
14. [Da Vinci Octant](#)
15. [Eckert-Greifendorff](#)
16. [Ginzburg TsNIIGAIK \(Polar Aspect\)](#)
17. [Gnomonic projection](#)
18. [Hägerstrand Logarithmic Azimuthal projection](#)
19. [Hammer-Aitoff projection](#)
20. [Hammer-Aitoff projection \(Oblique Aspect\)](#)
21. [Hammer Retroazimuthal projection](#)
22. [Lambert Azimuthal Equal-area](#)
23. [Land-Sea Hemispheres](#)
24. [Littrow projection \(or Weir Azimuth Diagram\)](#)
25. [Littrow-Lagrange projection](#)
26. [Maurer SNo_196 \(Double Retroazimuthal\) projection](#)
27. [\[O. M.\] Miller Oblated \(or Prolated\) Stereographic projection](#)
28. [Nordic projection](#)
29. [Orthographic projection](#)
30. [Petermann Star](#)
31. [Raisz Star](#)
32. [Snyder's 'Magnifying-Glass' Azimuthal Equal-area projection](#)
33. [Snyder's 'Magnifying-Glass' Azimuthal Equidistant projection](#)

Octant.cdr

www.cssiss.org/map-projections/Azimuthal/Da_Vinci_Octant.pdf



Da Vinci Octant: Ungrouped



Bottom line

- Use GIS or other mapping software to create map form, layout and to handle data
- Pass result to editing tools to use the design loop
- Use Inkscape and GIMP
- Better maps through:
 - knowledge
 - skill
 - experience
 - creativity
 - esthetics
 - understanding human vision (first lecture)