

Geospatial Software Institute Community Survey Results

Becky Vandewalle^{1,2},

**William Barley³, Shaowen Wang^{1,2}, Anand Padmanabhan^{1,2},
and Yan Liu⁴**

1. Department of Geography and GIS, University of Illinois

2. CyberGIS Center for Advanced Digital and Spatial Studies, University of Illinois

3. Department of Communication, University of Illinois

4. Oak Ridge National Laboratory

Dynamic Geospatial Research Environment

- Opportunities and challenges
- How to best support geospatial software users in this environment?

Geospatial Software Institute (GSI)

- Multi-year NSF planning grant for GSI (OAC-1743184)
- Currently active community institutes:
 - Institute for Research and Innovation in Software for High Energy Physics
 - Science Gateways Community Institute (SGCI)

GSI Planning Objectives

- Assemble a team of geospatial experts
 - Academia, government, industry
- Develop a strategic plan
 - Vision, direction, purpose, goals

Steps for Planning GSI

- Series of 3 workshops
- Engagement/outreach opportunities
- Determine community needs and requirements

How to find out more about the Geospatial Community?

- Survey geospatial software users!
- Survey Team:
 - William Barley, Shaowen Wang, Anand Padmanabhan, Yan Liu, Becky Vandewalle
- Initial survey, follow-up survey

Survey Design

- What do we want to discover from survey participants?
 - Who are they? Their needs?
- Geospatial software use
- Perceived limitations
- What types of research questions are currently limited by limitations of geospatial software

Survey Sections

- Introduction
- Geospatial Software Used/Frequency of Use
- What do you use geospatial software for?
- Data/Analysis/Computation
- Software Development
- Access/Sharing/Publishing
- Demographics

Survey Implementation

- Qualtrics
 - Web-based survey platform
- Voluntary
- IRB



Finding Participants

- GIS Listservs
 - AAG, AGILE, CRYOLIST, CyberGIS, Geo4all, SIGSPATIAL, SESYNC, UCGIS, XSEDE
- Open invitation at workshops/conference talks

Analysis Methods

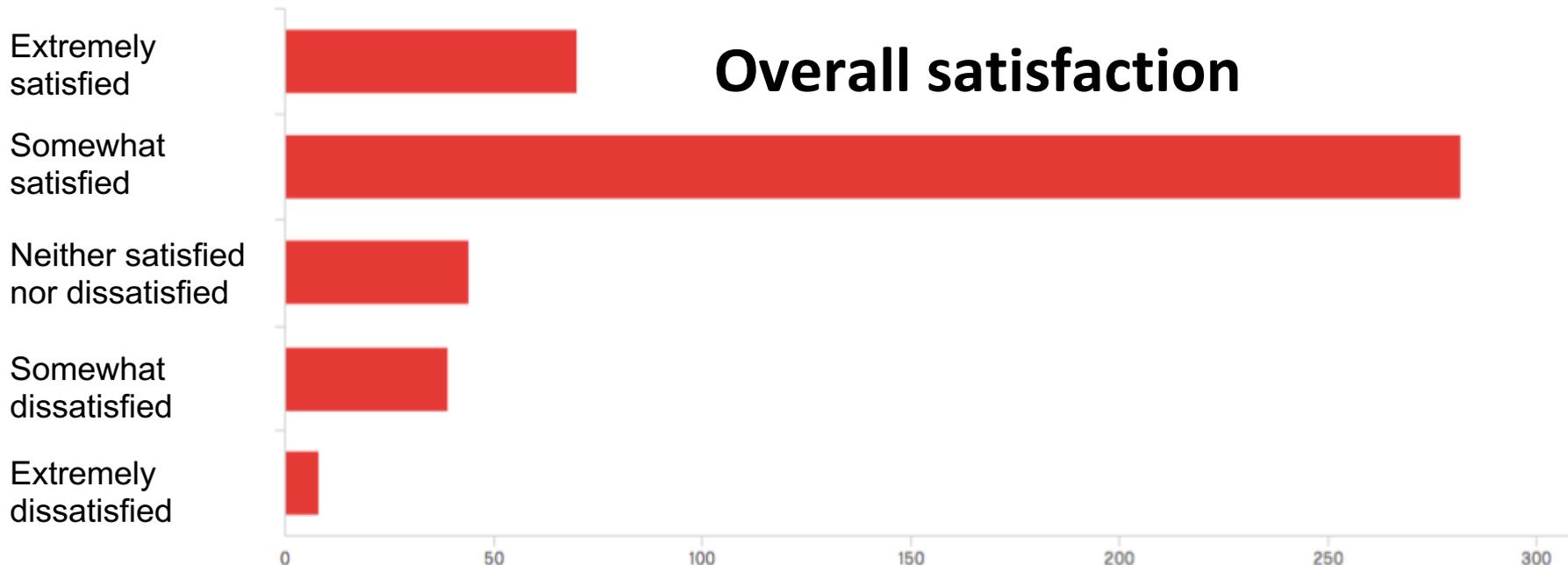
- Descriptive charts/statistics
- Qualitative coding

Results

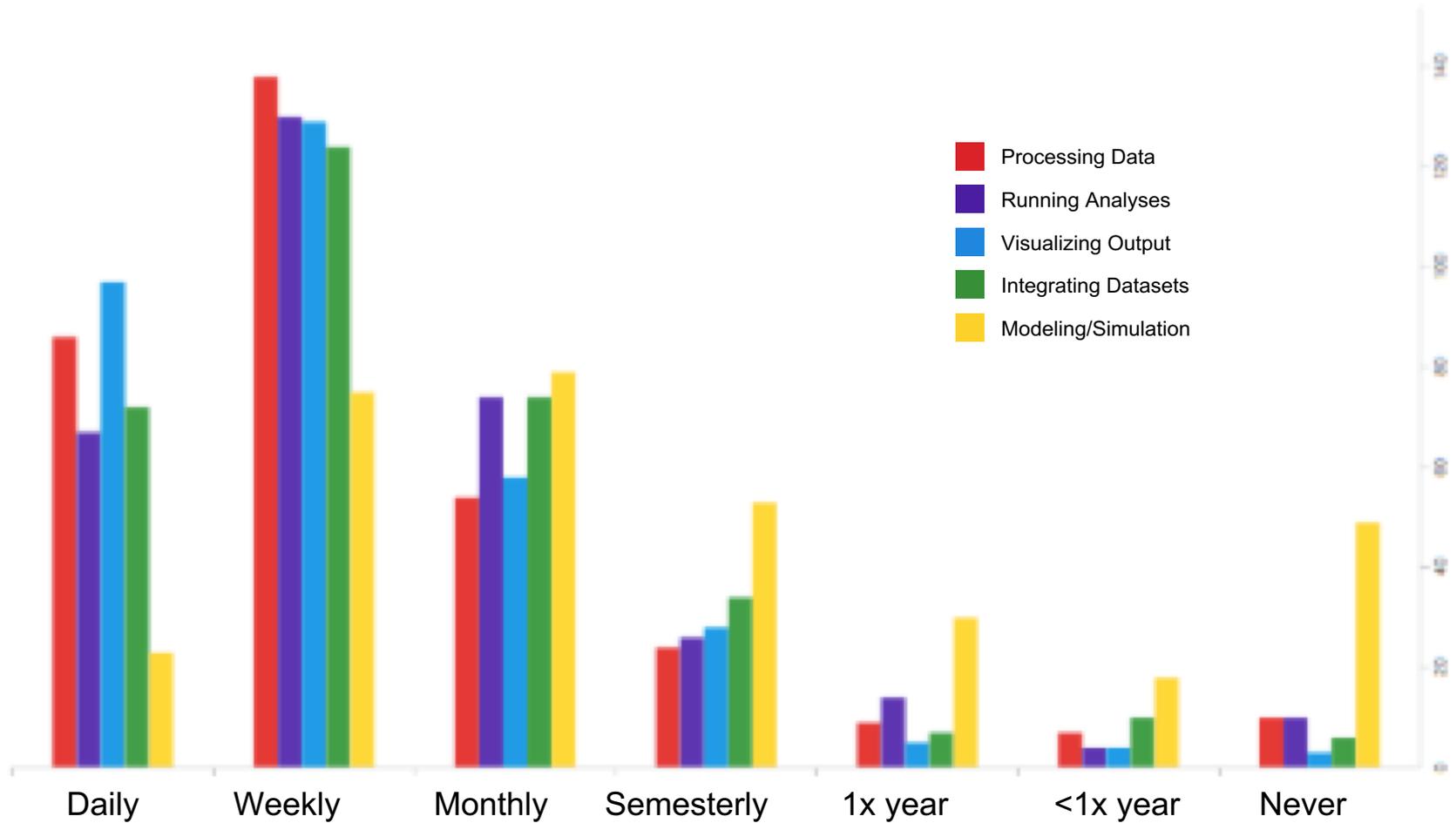
- Responses from Jan-Dec 2018
- 526 responses
 - ~446 with usable data
 - 271 completed all questions
- 29% Female, 66% Male
- 62% Academic, 19% Government, 17% Industry/Non-profit

Overview

- 82% use geospatial software \geq 1x per week
- 90% see tools as extremely/very important to their work

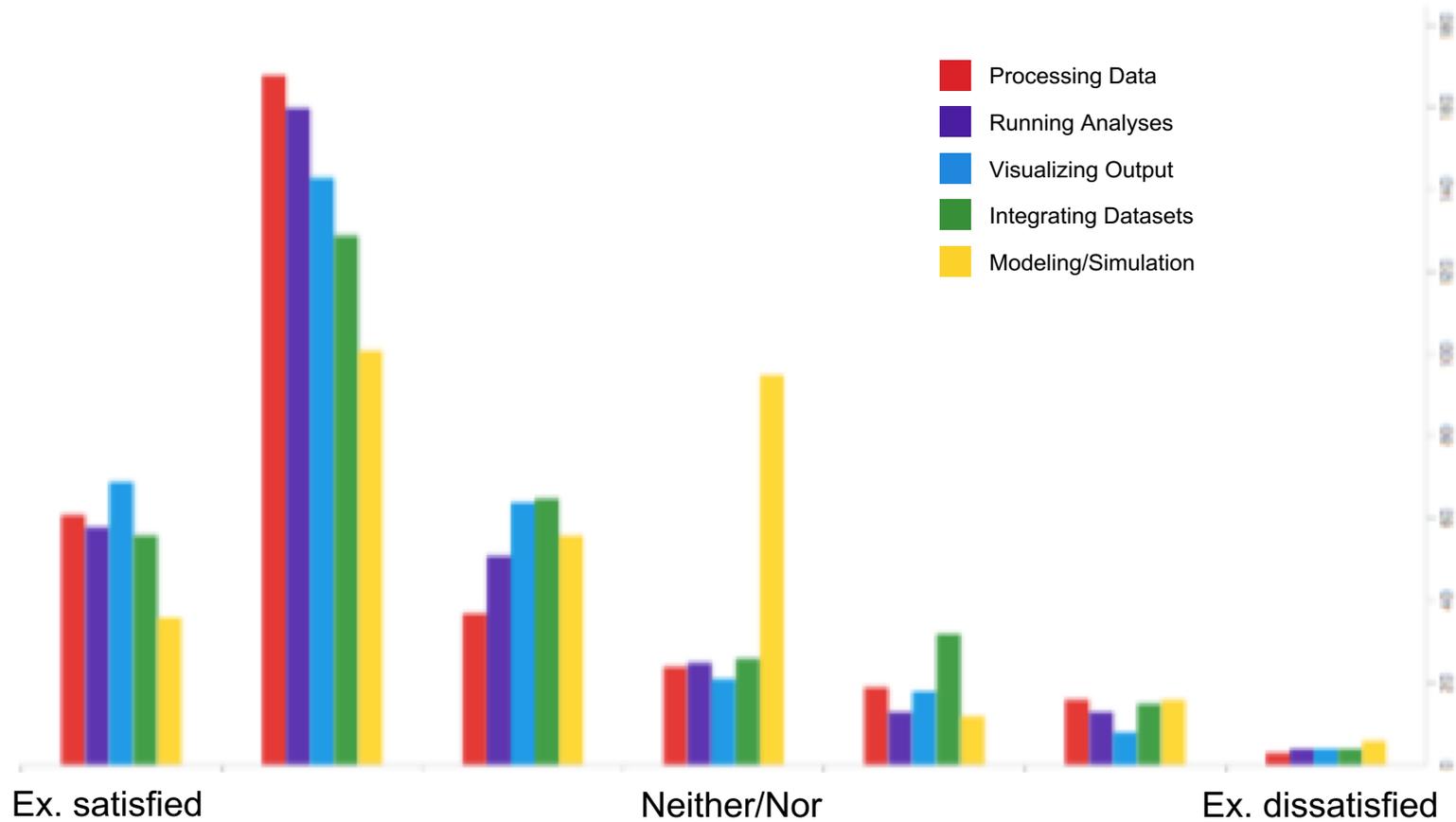


Geospatial Software Uses



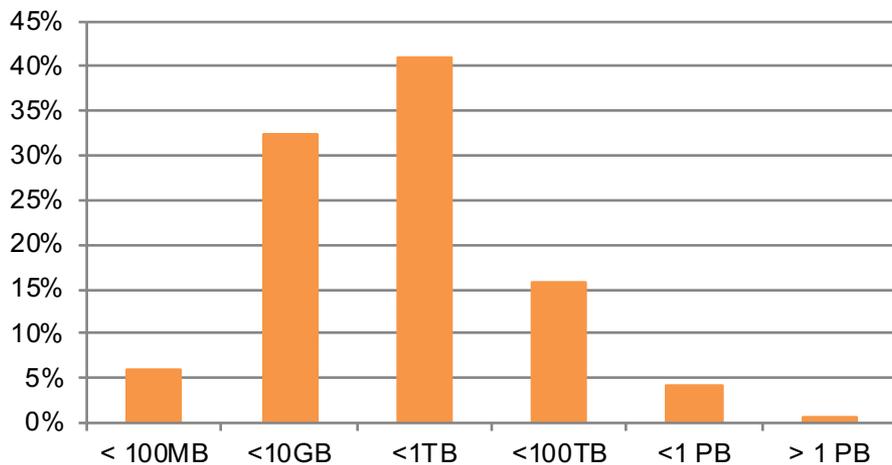


Satisfaction

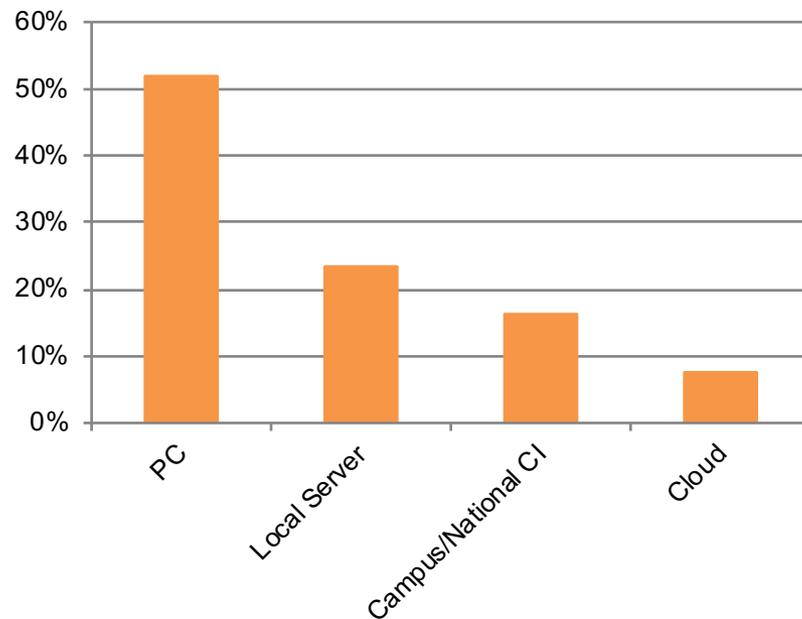


An Example Analysis

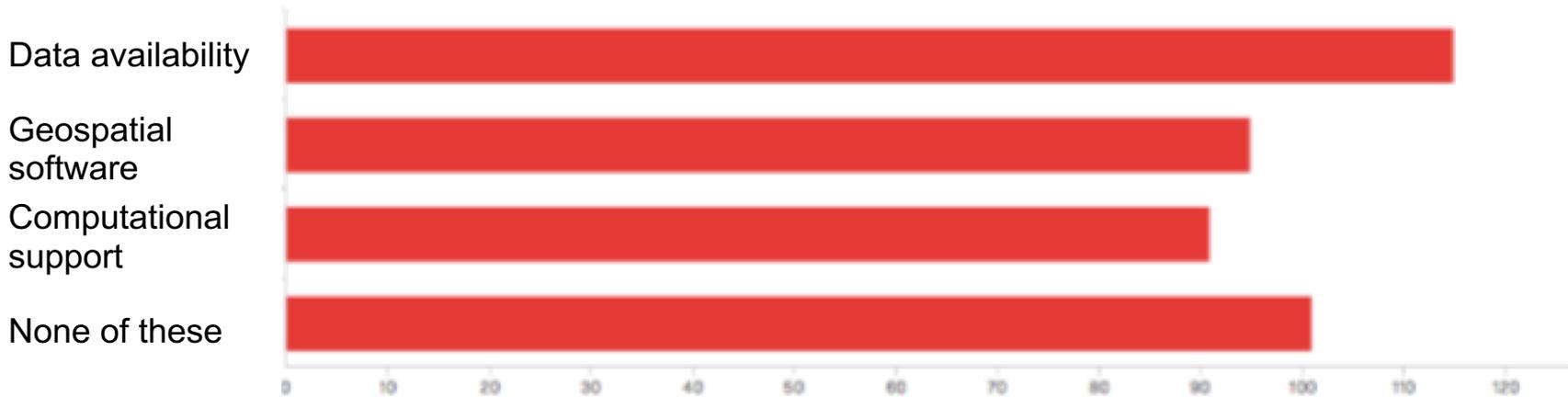
Data Size



Computing Platform



Limitations



42% of users reported their work was limited by inadequacies in geospatial software (n=329)

Limitations

- Steep learning curve
- Difficult to find appropriate tools
- Inconsistent data availability and suitability
- Difficulty integrating heterogeneous data
- Too fast or too slow development rate
- Buggy, fragile software ecosystem
- Poor inter-tool compatibility, tool scope
- Costly resource access (for data, computation)
- Computing limitations

Directions

- Integrating complex heterogeneous data
- Analyzing larger datasets
- Forecasting and modeling
- Scientific exploration

Thoughts

- “Often, research questions are confronted with having to use a myriad of tools, resulting in a Frankenstein approach to produce a desired outcome”
- “While it is essential to keep innovating software and methods, it happens at a pace that's difficult to keep up with”
- “I don't want to anticipate all the science questions that can be considered if we had access to amazing geospatial software”

Future Work

- Write up and publish survey results
- Next workshop, final survey

Thank you!

Rebecca Vandewalle,
rcv3@illinois.edu

Visit the GSI website: <http://gsi.cigi.illinois.edu/>