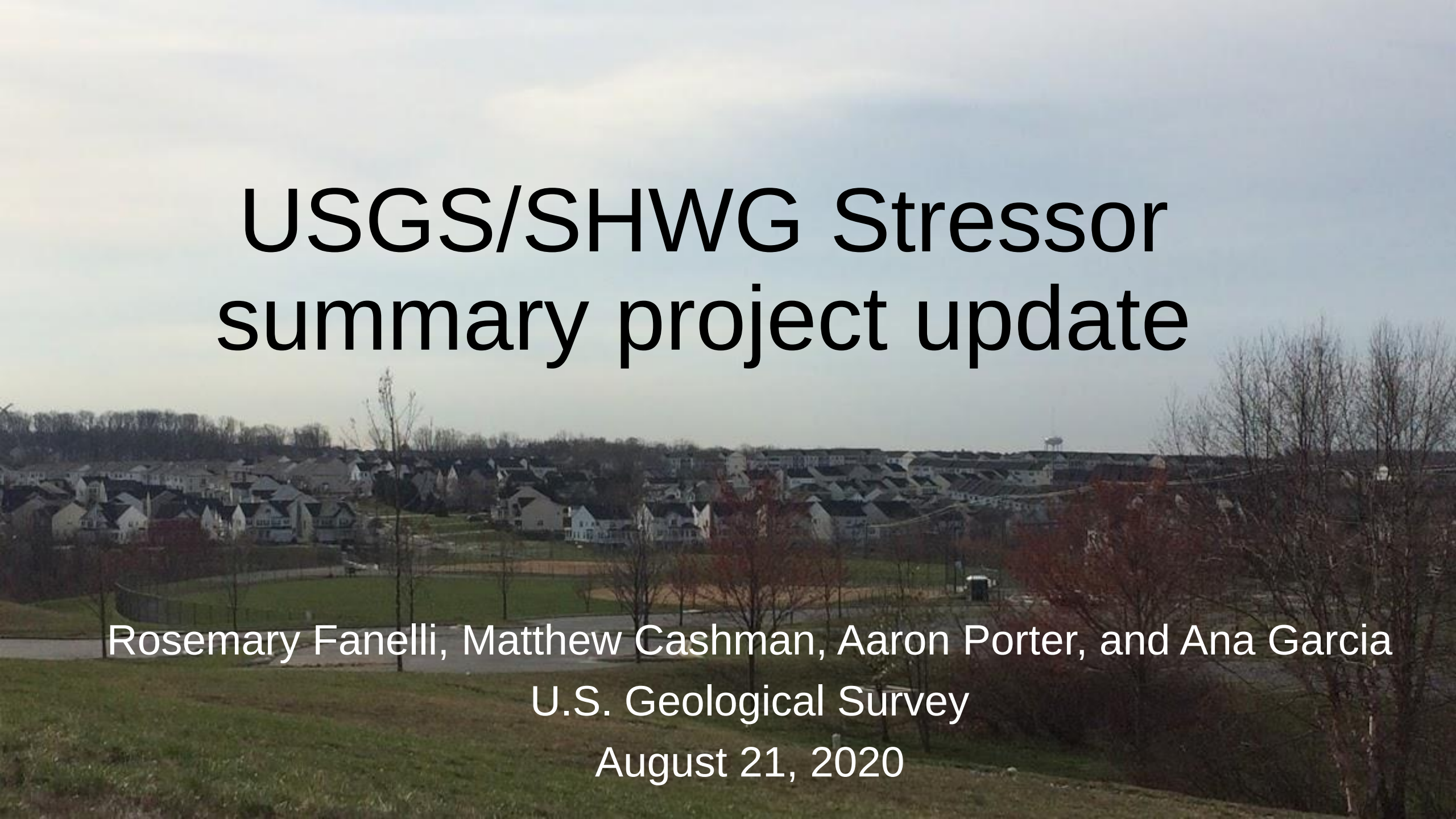

USGS/SHWG Stressor summary project update

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U.S. Geological Survey

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Progress on stressor summary project

- Defined scope of literature review
- Developed initial information extraction plan
- Conducted preliminary search
- Receive feedback from stakeholders
- Revise information extraction plan and expanded search to cover additional topics
- Receive feedback from stakeholders
- Write up results and interpretation
- Revise written product based on feedback
- Disseminate information to stakeholders

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- Defined scope of literature review ✓
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- Receive feedback from stakeholders ✓
- Revise information extraction plan and expanded search to cover additional topics ✓
- **Receive feedback from stakeholders**
- Write up results and interpretation
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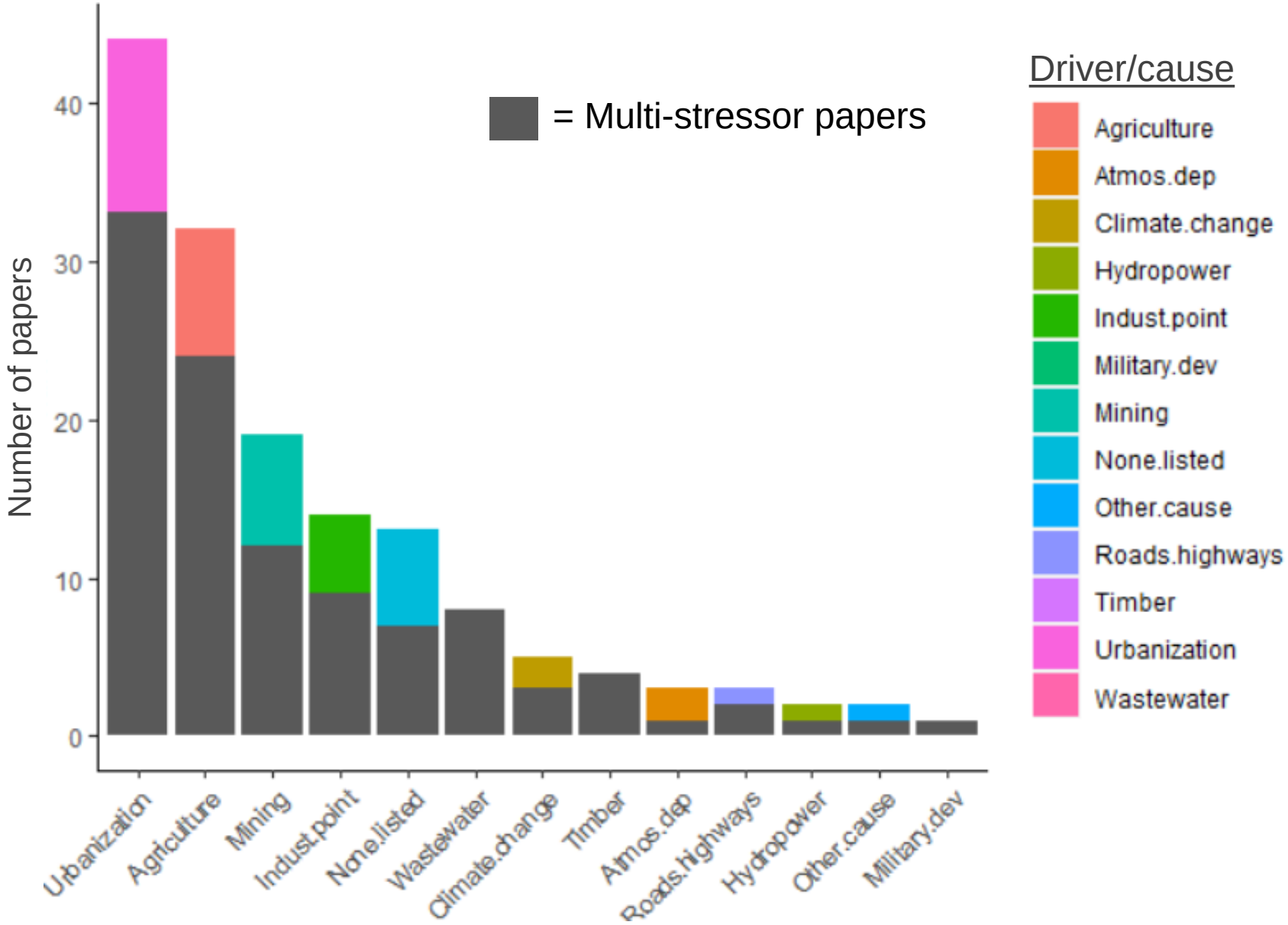
What were the major causes identified?

- Out of 113 papers:
- 38% urbanization
- 28% agricultural
- 17% mining
- 13 papers did not have defined cause
- 22% of papers (29) explored multiple causes simultaneously

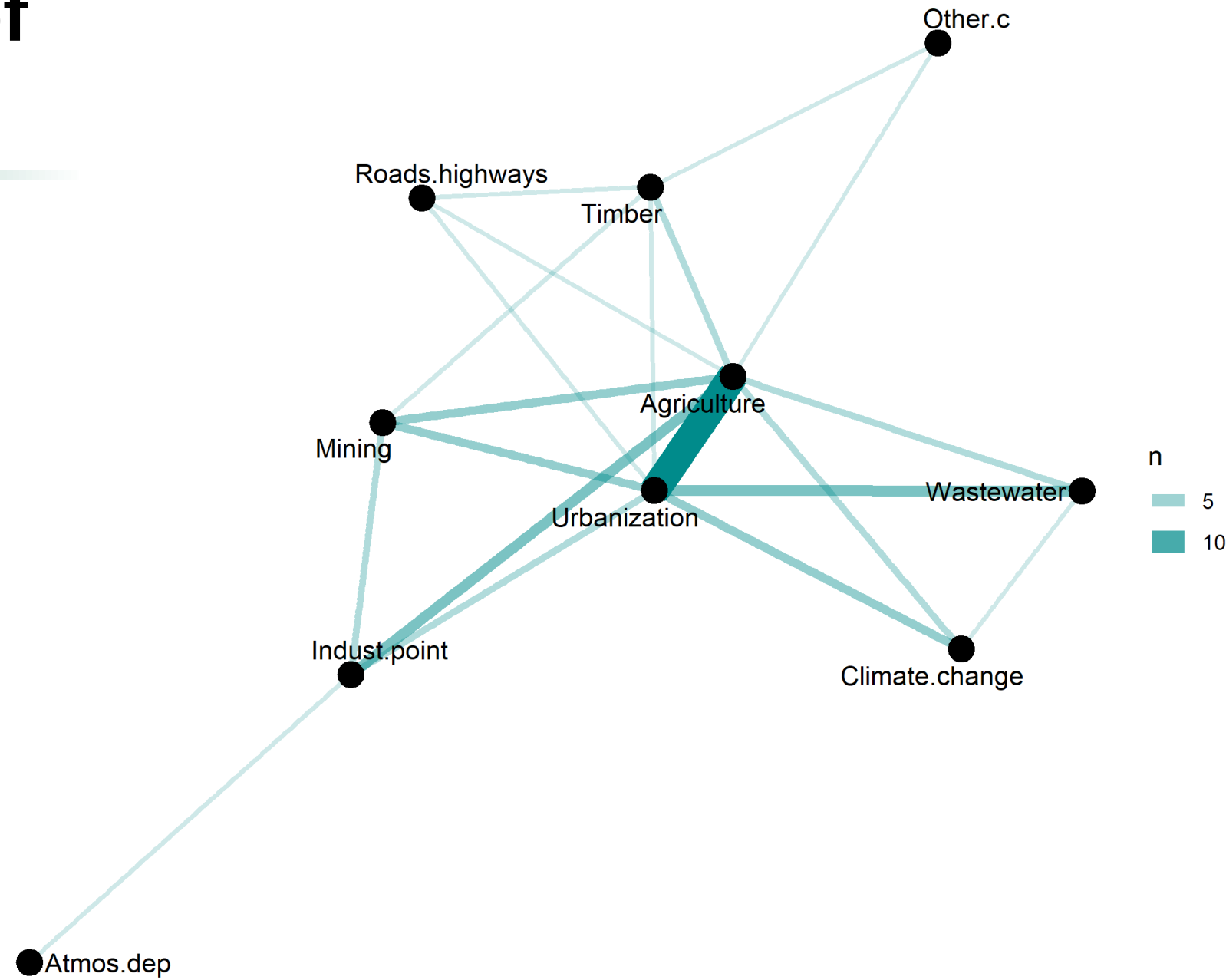


Provisional results, for feedback only

Comparing effects of multiple drivers

12% of studies (14 studies) examined urbanization and agriculture simultaneously

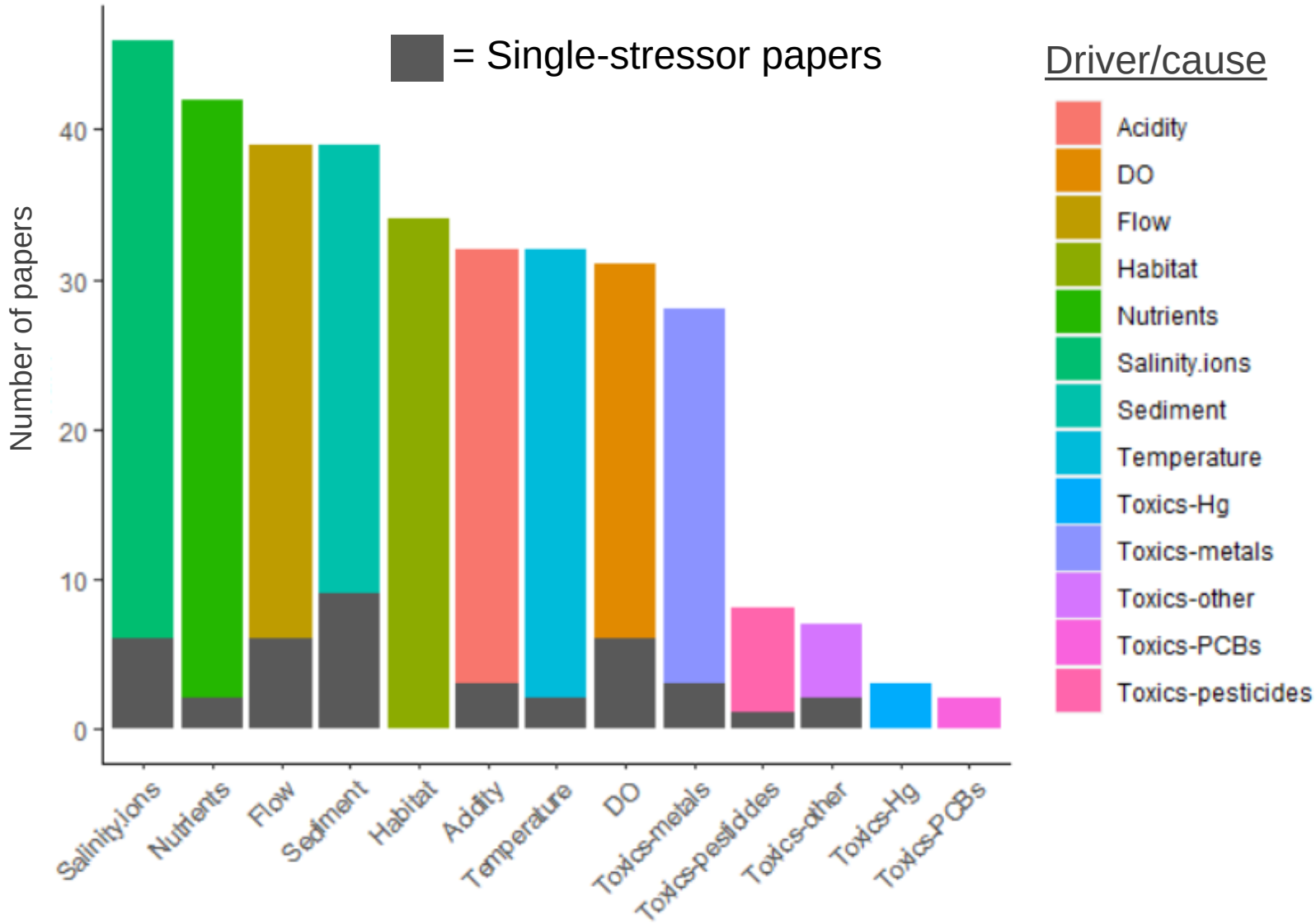
4 studies examined general urbanization and wastewater impacts simultaneously



Provisional results, for feedback only

What types of stressors were measured?

- Water quality and flow were most commonly measured stressors
- Metals was most common toxics category
- Effects of Hg and PCBs rarely covered in literature for macroinvertebrate effects



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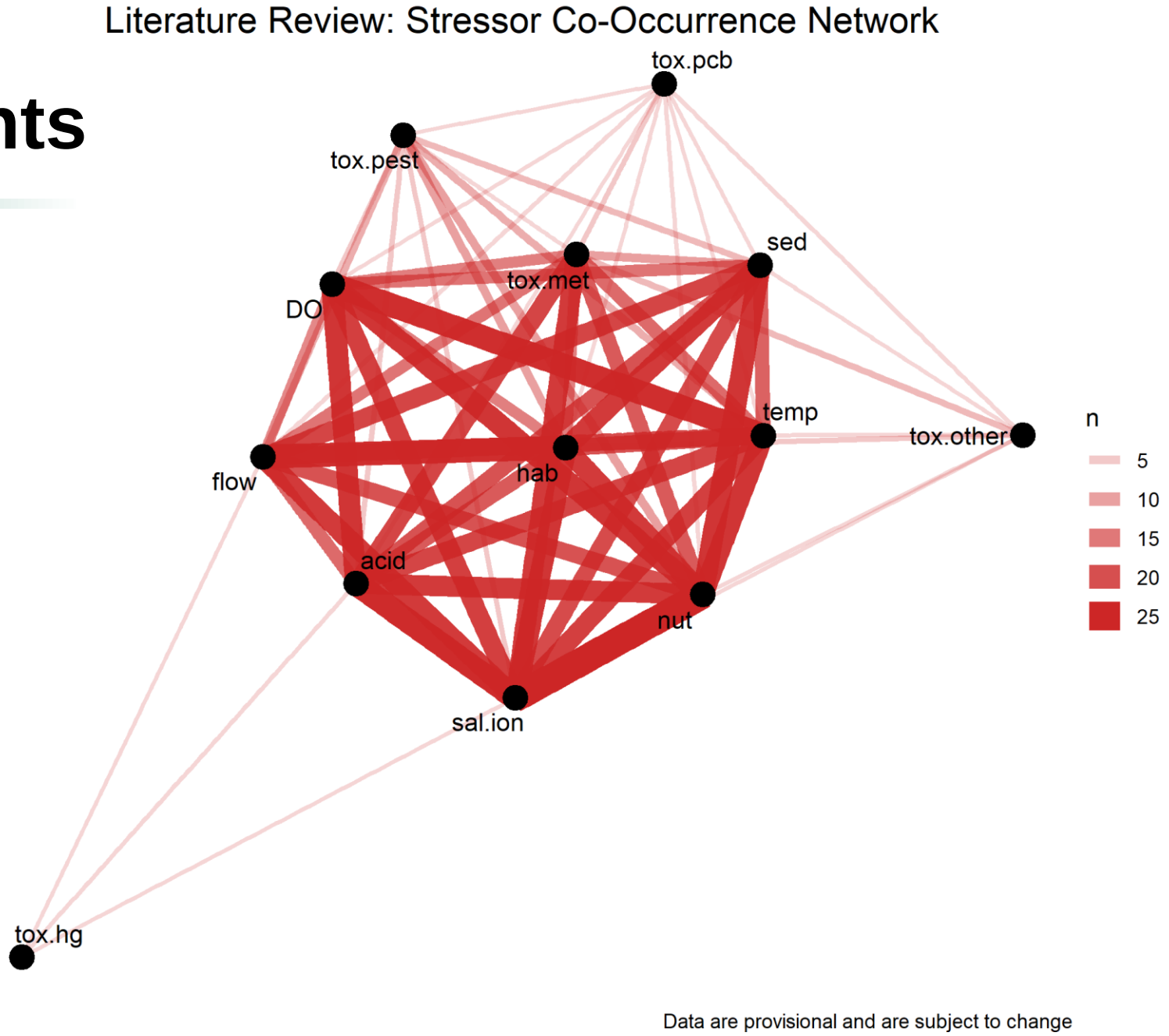
Co-occurrence of stressor measurements

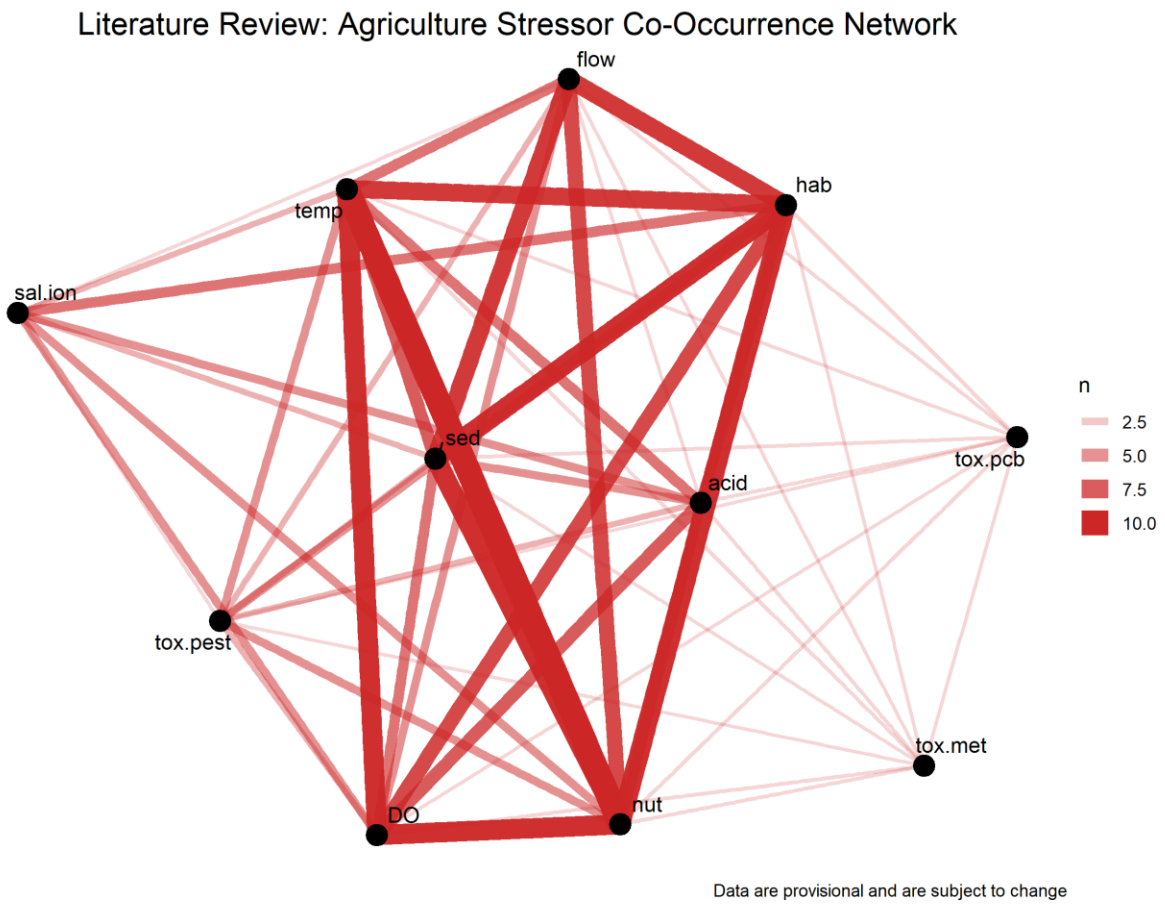
- Good representativeness in coverage across multiple stressor studies
- Fewer studies with toxics and other stressors

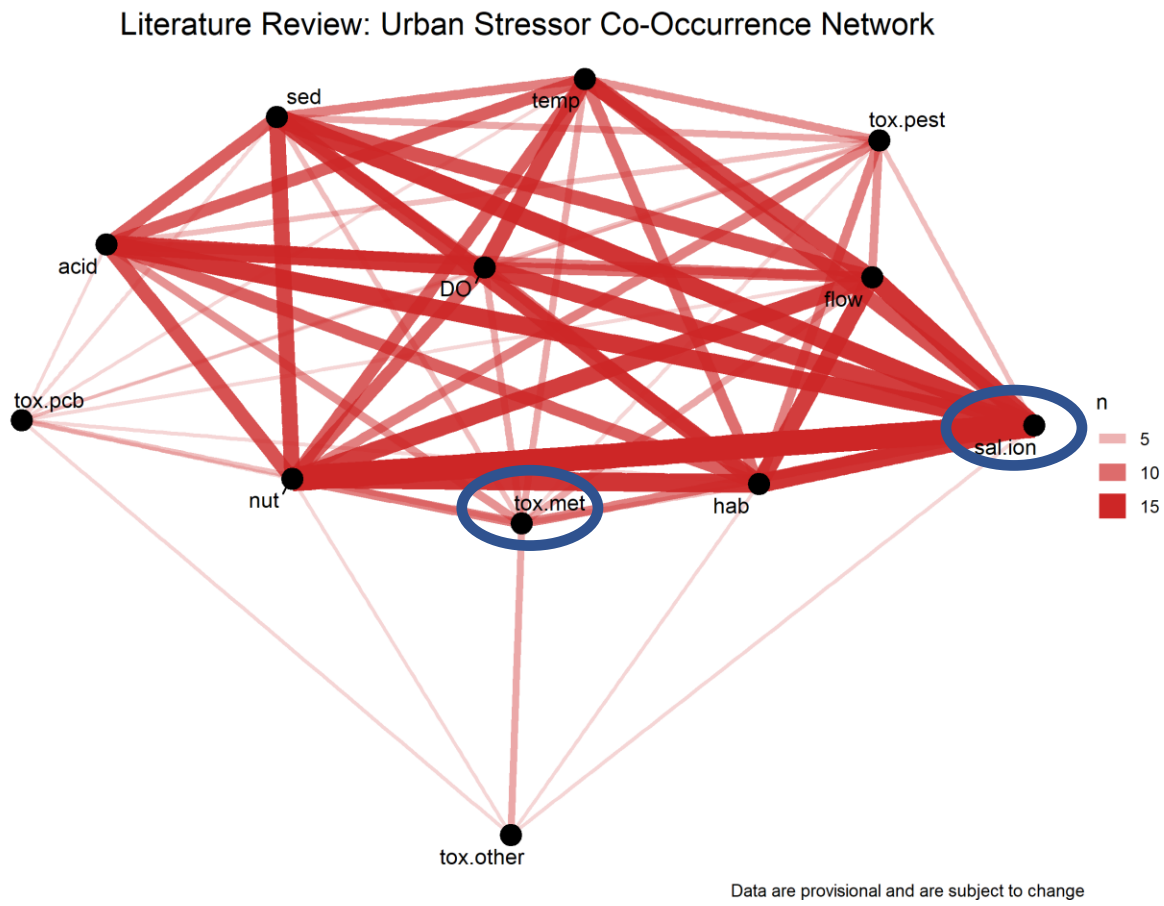


Provisional results, for feedback only

What was measured in Ag and urban studies?

- Some similarities in studied parameters, slightly more multiple stressors in urban
- Difference in toxic metals and salinity/ions





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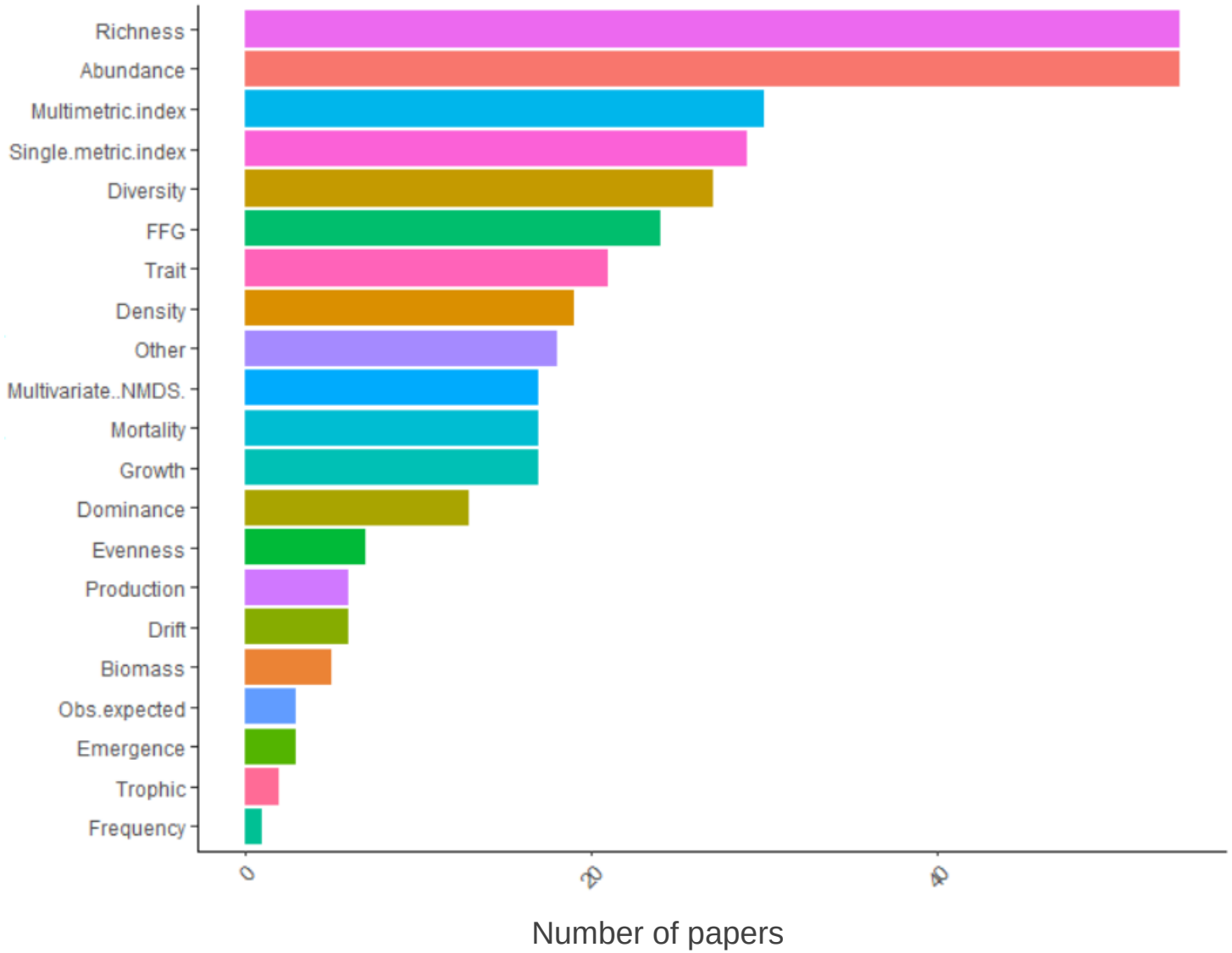
What biological endpoints were reported?

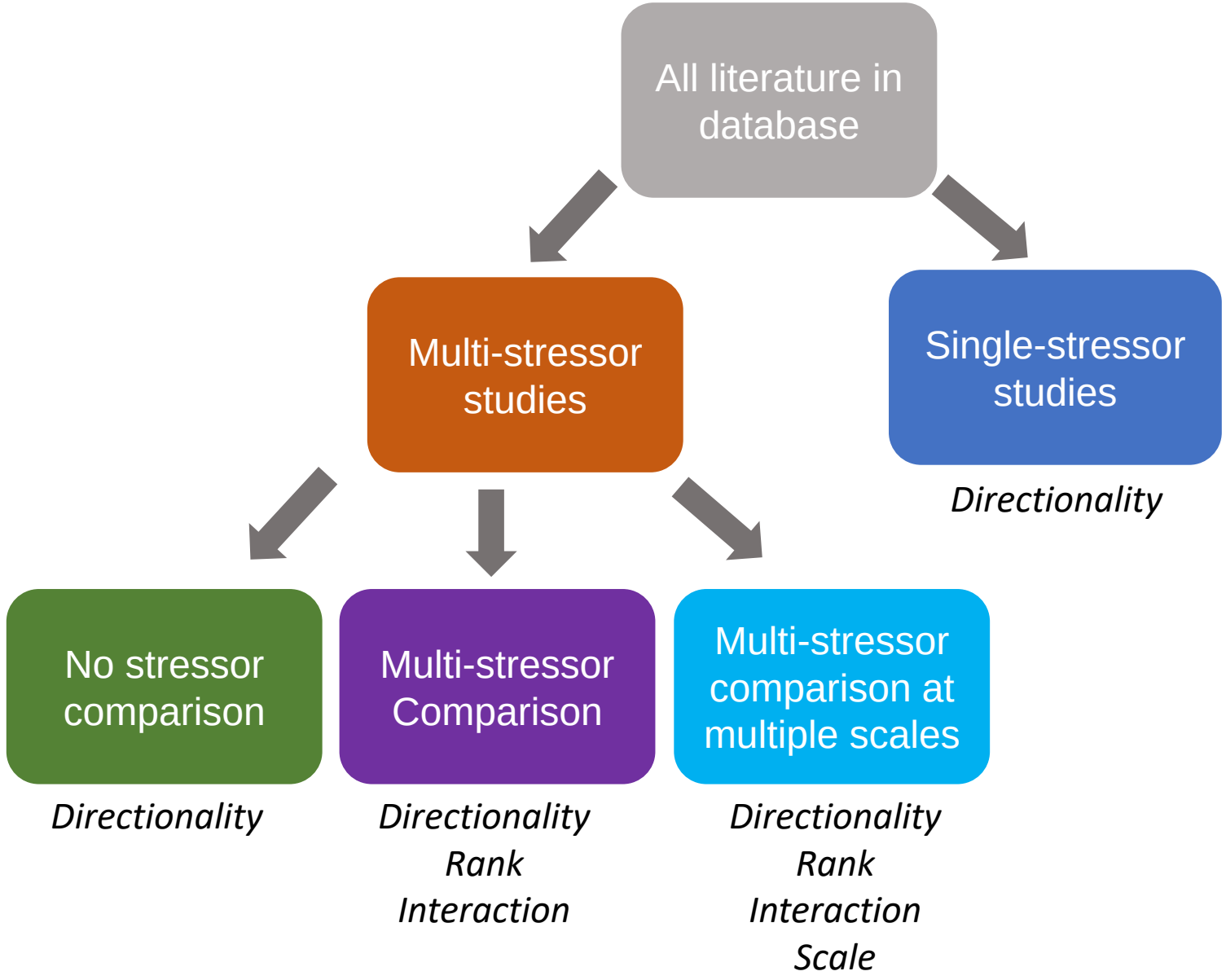


- Community composition metrics (richness, abundance) most common response variables
- Multi-metric indices often reported, but vary widely
- Lab/mesocosm/flume studies reported growth, mortality, biomass, and emergence

Provisional results, for feedback only

Major questions and analysis workflow

1. **<u>Directionality</u>**: How does a stressor or driver affect the biological community?
2. **<u>Rank</u>:** How do different in-stream stressors compare to each other in terms of their effect on the biological community?
3. **<u>Interactions</u>:** Do stressors/drivers have interactive effects?
4. **<u>Scale</u>:** How does the effect of in-stream stressors compare to landscape-scale drivers?



Caveats and other topics to be discussed

Caveats

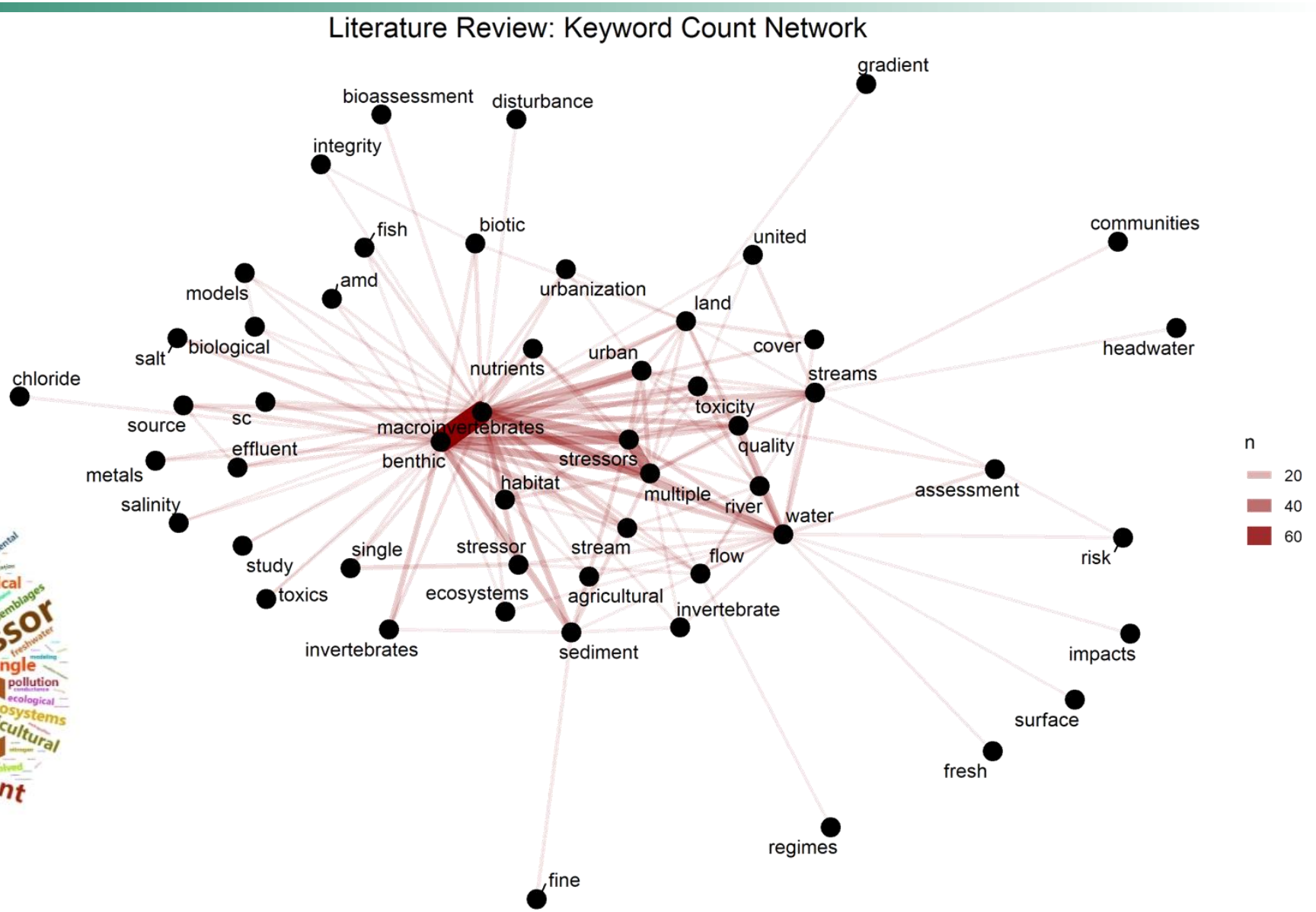
- Multiple metrics reported for each stressor “type” (nutrients = TN, TP)
- Multiple response variables in each study
- Rank doesn’t take into account stressors that weren’t measured

Other questions/discussion topics

- Stressors affecting other organisms (fish, algae, amphibians)
- Discussion of statistical modeling approaches
- In-direct effects of stressors (salinity and water quality, bioaccumulation of toxic contaminants)
- Specific focus on thresholds from lab toxicological and single stressor studies

Textual analyses – Article Keywords

- Common article keywords
- Identifying thematic clusters in studies



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Data are provisional and are subject to change

Textual analyses – Abstract Clustering

- Common abstract words clustered by co-occurrence
- Identifying thematic clusters in studies

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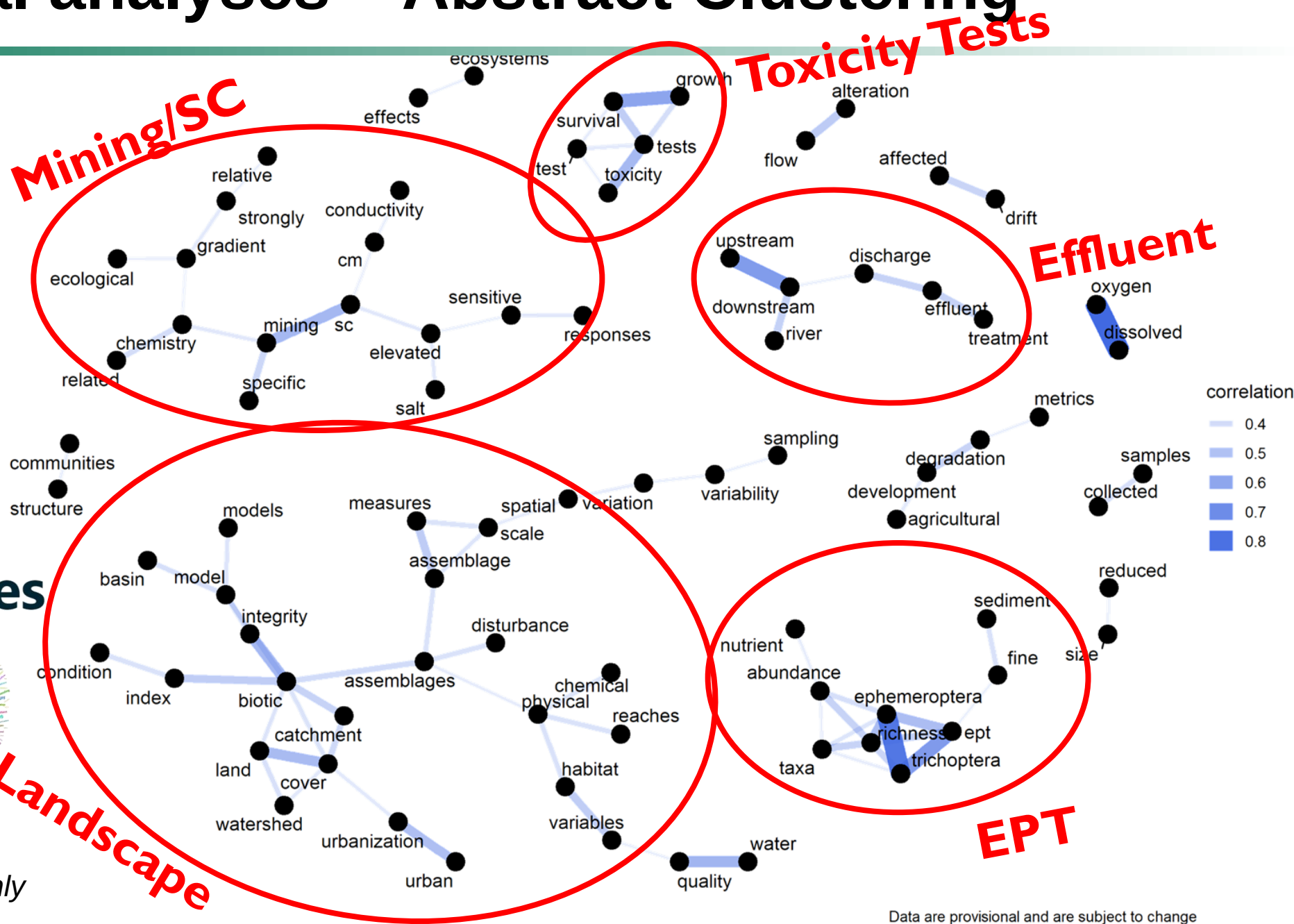

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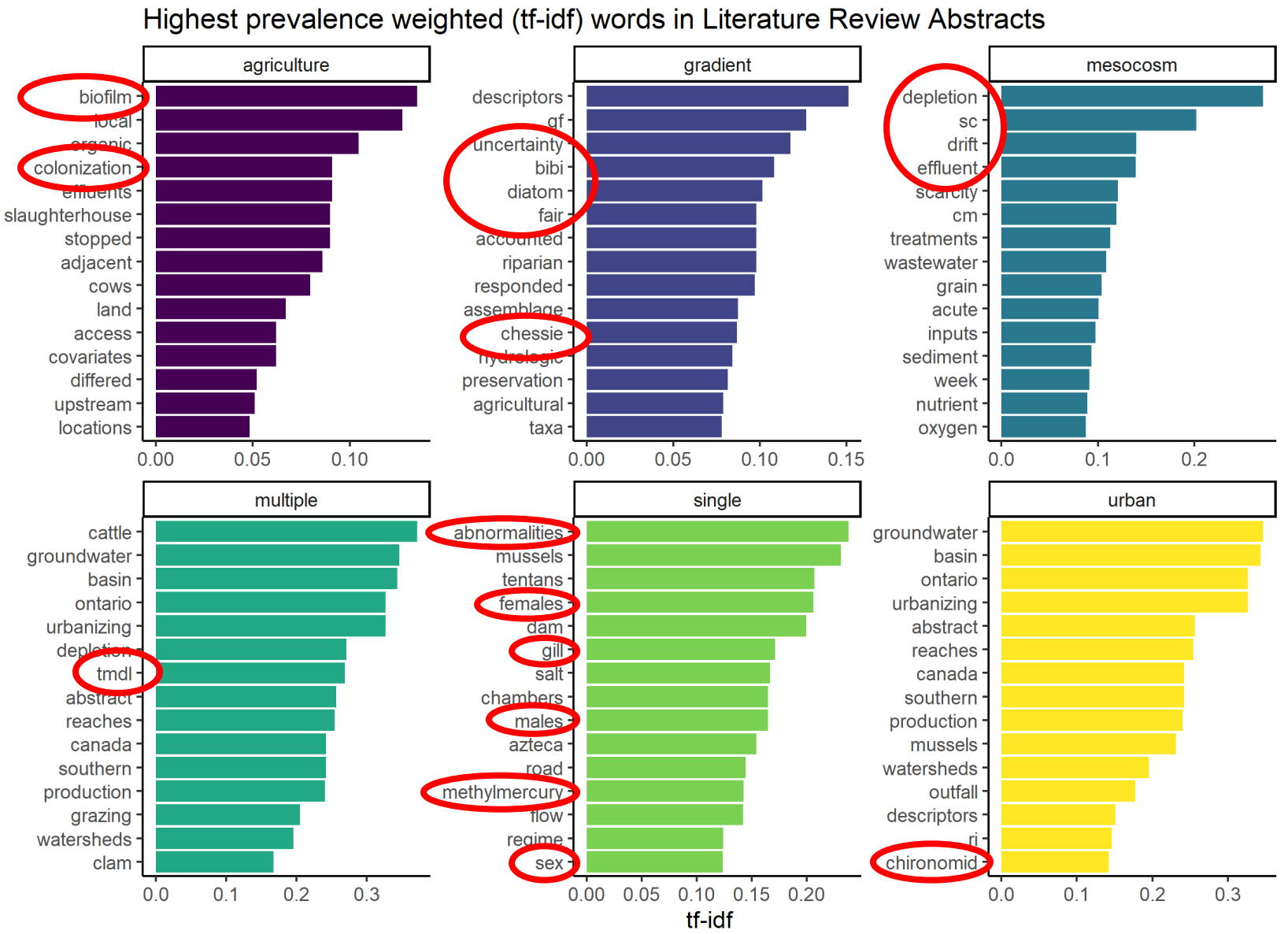
Textual Analysis: Characteristic rare terms

- Characteristic rare terms (tf-idf) calculated from abstract to further examine studies
- Terms highlights important, uncommon words from that study
- Grouped by keyword used to tag article
- Provides additional study-specific details



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Rough timeline

- Write up final results (September-December)
- Provide document to key SHWG members for internal feedback and begin internal USGS internal review process (December)
- Incorporate revisions into document (January-March)
- Host recorded presentation on the project and findings (April)
- Written summary released after internal review and formatting (Spring)