Uncertain Geodata: Bias, Missingness & GeoAI

Tartu, Tuesday 16 June 2026

Organiser: *James Ackland (University of Glasgow Geospatial Data Science Group)*

Topic(s) and focus

The workshop aims to bring together researchers from across GIScience to recognise the challenges that biased, missing, and high-uncertainty data present to our research and its applications. This topic touches on challenges that will be familiar to anyone who has worked directly with data, either as the focus of their research or as a means to other inferential ends, such as in GeoAI.

- Biased Data and Adjustment
- Missing Data and Imputation
- Data Quality in GeoAI Training Data
- Uncertainty and Communicating Uncertainty
- Propagation of Data Deficiencies into Applications and Outputs
- Reproducibility, Generalisability, and Open Science
- Ethics of Using Flawed Data and Imputation
- Further Issues in Data Quality

Objective(s)

Agenda setting: To promote the importance of understanding and mitigating biased and missing data as part of the wider agenda for GIScience.

Perspective sharing: To gather perspectives from our panel and audience on the state of the field as regards data quality, mitigation practices, and downstream effects of data quality on research impact.

Standards for practice: To consider benchmarks and frameworks for evaluating the impact of biased and missing data on applied research.

Planned outcome(s)

Skill-sharing: To widen awareness of the state of the art in methodological solutions to biased and missing data.

Research dissemination and feedback: To provide a platform for short talks which can focus on the details of a specific data challenge, rather than the general expectation of an academic talk to present a more ‘polished’ paper or idea. We hope some work-in-progress research will be improved by feedback at this workshop.

Training: To engage with researchers, particularly postgraduates, interested in data science approaches to GIScience and disseminate best practices in areas like imputation and bias-aware AI training.

Output: As well as the workshop proceedings, we intend discussion at the workshop to provide context for a commentary-style paper. We anticipate the paper would:

a) define the problems of bias and missingness as they apply to GIScience,
b) discuss the perspectives expressed during the workshop, structured in terms of the topics in 1.3
c) present future directions such as identified research questions and standards for translating research into practical applications.

Workshop format

For up-to-date details of the programme, including confirmed panellists, see https://gdsglasgow.github.io/16-june-or-agile-worksop-uncertain-geodata-bias-missingness-and-geoai/ At the time of workshop confirmation, the programme is as follows:

Half-day workshop (4h)

1. Introduction by James Ackland, defining the problems and their timeliness
2. Open panel on data quality, representativeness, reproducibility and ethics
    a. The intention is to form a panel of four experts and a chair to speak to the topics of the workshop. Questions and conversation from workshop attendees will be encouraged after the chair has initiated the panel discussion.
3. Coffee break
4. Contributed short talks

    Attendees will be invited to submit short talks discussing issues of data bias or missingness arising in their own research, with a preference for the discussion of applied or actionable research.

5. Attendee working groups

    Attendees will be invited to join a working group according to their interest, which should "break out" from the main space and work to summarise and extend the conversation on their subtopic from the earlier parts of the workshop. The ideas and synthesis returned by these working groups will be used to inform the commentary-style paper, which will acknowledge all participants. Working group subtopics might include:

    a. Origins of bias and missingness in geodata
    b. Bias adjustment and imputation for geodata
    c. AI & downstream impact
    d. Sampling, representativeness, and open science
    e. Ethics and privacy
    f. Space for a further breakout group on any arising topic
6. Closing remarks by James Ackland, thanking participants and summarising discussion from around the working groups and the workshop as a whole.

Target audience

- Geospatial data scientists, broadly defined
- Quantitative social scientists
- Statisticians
- Reproducibility and Open Science practitioners

No prerequisites but we anticipate attendees are likely to have a degree of familiarity with issues of data representativeness and quality.