NOAA Storm Events in Literature

Concerns with Storm Events Database

Hazard Bias

Within the Storm Events database, there may be inaccurate recording in the number of certain hazard types. This may arise from the difficulty of sorting storm events that include multiple types of hazards. There are definitional differences between events as well as certain events correlating to multiple event categories.

- P(event recorded | event happened) may be different by events
- There can be inaccurate recording of the frequency of certain hazards types within the database
- This is influenced by the goal or audience of the database
  - For example, the US is esepcially concerned with monetary losses from floods so it may be more likely for flood events to be reported (Gall, Borden, and Cutter 2009)
  - The National Flood Insurance Act passed in 1968 created the National Flood Insurance Program which helps provide flood insurance

    *script to pull up number of floods compared to other events in noaa, no difference in monetary loss estimates pre and post 1968, so is this example not valid here?
- This also arises from the difficulty of sorting storm events that include multiple types of hazards
  - Definitional differences (Gall, Borden, and Cutter 2009)
  - one episode can correlates to mulitple events (Konisky, Hughes, and Kaylor 2016)

    *script for how noaa deals with this? or examples of this?
- limited information on event severity or distinction between events (Luh et al. 2015)
- interrupted time series analysis: change in flood policy since 1996
  - years of big policy changes for floods (flood insurance)

Temporal Bias

Temporal bias can occur in the Storm Events database as the number of storm events and loss estimates change over time. This occurs as a result of changes in recording strageties, advancements in monitoring and detecting sotrm events, or better monetary loss accounting. For example, in the NOAA database, from 1950 to 1954, only tornado events were recorded ("Storm Evetns Database," n.d.). From 1955 to 1992 only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data ("Storm Evetns Database," n.d.). From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files("Storm Evetns Database," n.d.). Starting in 1996, 48 event types are recorded("Storm Evetns Database," n.d.). This poses inconsistensies in the number of certain storm events over large periods of time. More temporal bias may occur from seasonal differences in number of events reported. NOAA exhibits higher rates of rip currents in the summer versus the winter.

- There can be changes in the number of storm events and loss estimates reported over time (Gall, Borden, and Cutter 2009)
  - Advancements in monitoring and detecting: sometimes descriptions include equipment used

  - Better loss accounting
  - New process for loss estimation developed by NWS in 2007
  - Switch between categorical estimates to whole dollar figure estimates: uses logarithmic at some point?
    * pull up loss data for events pre and post 1995
  - check for changes in reporting for NOAA under Database Details
    * from 1950 to 1954, only tornado events were recorded (NOAA-how should I cite this?)
    * from 1955 to 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files
    * From 1996 to present, 48 event types are recorded
- Seasonal Differences in number of events reported
  - Example of rip currents in summer vs winter
    * run for our data and check literature for seasonality of the weather event
    * create table of number reported by lifeguards or media vs month of the year
  - other events that are more or less reported?

Threshold Bias

The varying severity of an event creates threshold bias in the storm events database. Events of larger maginutude and/or damage to human health are better documented, while events of smaller magnitude are less reported becasue less people are affected (Gall, Borden, and Cutter 2009). Small events may even be excluded due to threshold criteria in the database (Gall, Borden, and Cutter 2009).

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- Events of smaller magnitude are less reported becasue less people are affected (Gall, Borden, and Cutter 2009)
  - may even be excluded due to threshold criteria (Gall, Borden, and Cutter 2009)

Accounting Bias

There are discrepencies in the type of loss information collected in the storm events database leading to accounting bias. Direct monetary losses from damage to infrastructure, buildings, crops, etc. are easier to quanitfy than indirect losses like lost revenue, business closures, societal losses, environmental damage (Gall, Borden, and Cutter 2009). These monetary losses can also be separated into community, state, refional, and global levels (Gall, Borden, and Cutter 2009).

- Discrepencies in type of loss information collected (Gall, Borden, and Cutter 2009)
  - Direct monetary losses from damage to infrastructure, buildings, crops, etc. are easier to quanitfy than indirect losses like lost revenue, business closures, societal losses, environmental damage (Gall, Borden, and Cutter 2009)
    * how does noaa report different types of losses?
- Can count economic losses at community, state, regional, global level (Gall, Borden, and Cutter 2009)

  - what level does noaa report this at?
- How can nonmonetary losses be quanitifed?

Geographic Bias

The reporting of events can be affected by geographic location based on whether or not people are present to record the event. The supply of information is greater in areas closer to the weather event (Konisky, Hughes, and Kaylor 2016). There can also be changes at country or state level over time that lead to excluding or double counting events or loss data (Gall, Borden, and Cutter 2009). The NWS changed its reporting strategy from loss estimates by climate region to loss estimates in specific counties where event occurred around 1995 (Gall, Borden, and Cutter 2009). Currently, the smallest unit of aggregation to use all parts of database are Weather Forecasting Offices and there are about 122 nationwide (Konisky, Hughes, and Kaylor 2016). There may be inconsistencies between county regions and weather forecasting offices.

- Reporting affected by geographic location (Luh et al. 2015)
  - differences between rural/urban
    * tornado example
  - There can be changes at country or state level over time that lead to excluding or double counting events or loss data (Gall, Borden, and Cutter 2009)
  - NWS changed its reporting strategy from loss estimates by climate region to loss estimates in specific counties where event occurred (relevant for data in 1995 during switch) (Gall, Borden, and Cutter 2009)
    * script for checking event location pre and post 1995
- Supply of information is greater in areas closer to weather event (Konisky, Hughes, and Kaylor 2016)
- Smallest unit of aggregation to use all parts of database are Weather Forecasting Offices and there are about 122 nationwide (Konisky, Hughes, and Kaylor 2016)
  - zone and fips script

Systemic Bias

- Differences in initial data collection and compilation create difficulties in comparing databases
  - Source and how losses are computed
  - Actual dollar losses vs inflation adjusted losses
  - Whole dollars vs loss categories

References

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