METEOR

Modelling Exposure Through Earth Observation Routines

An Overview of Exposure Metadata

This section will provide a brief overview of the purpose, content, and format of exposure metadata.

Major "take-aways"

- What is the purpose of the metadata?

- How is the metadata content derived?
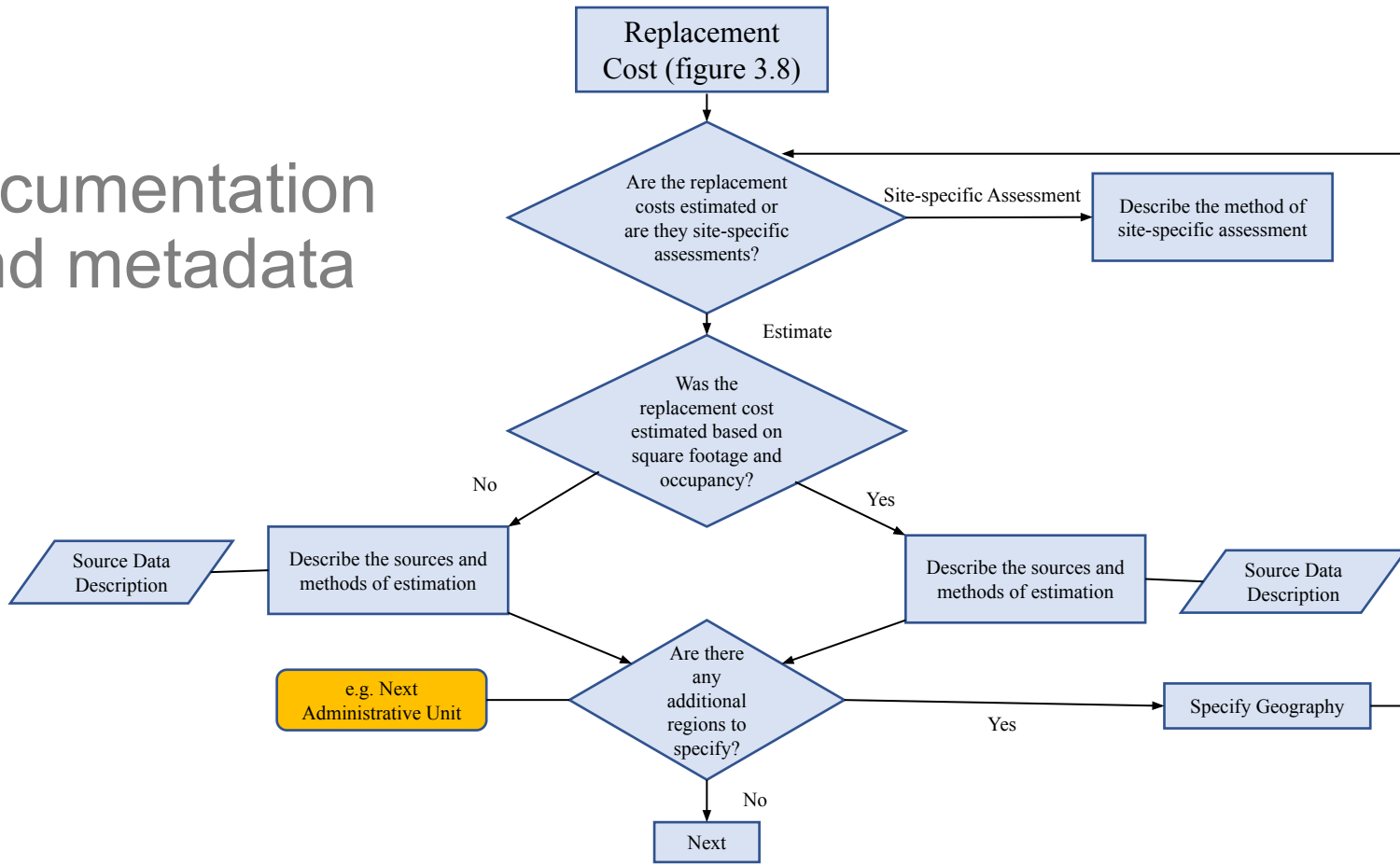
- What format is the metadata stored in?

What is the…?

- Spatial resolution
- Source of the data
- Replacement cost
- Data vintage
- And why is this point in the river?

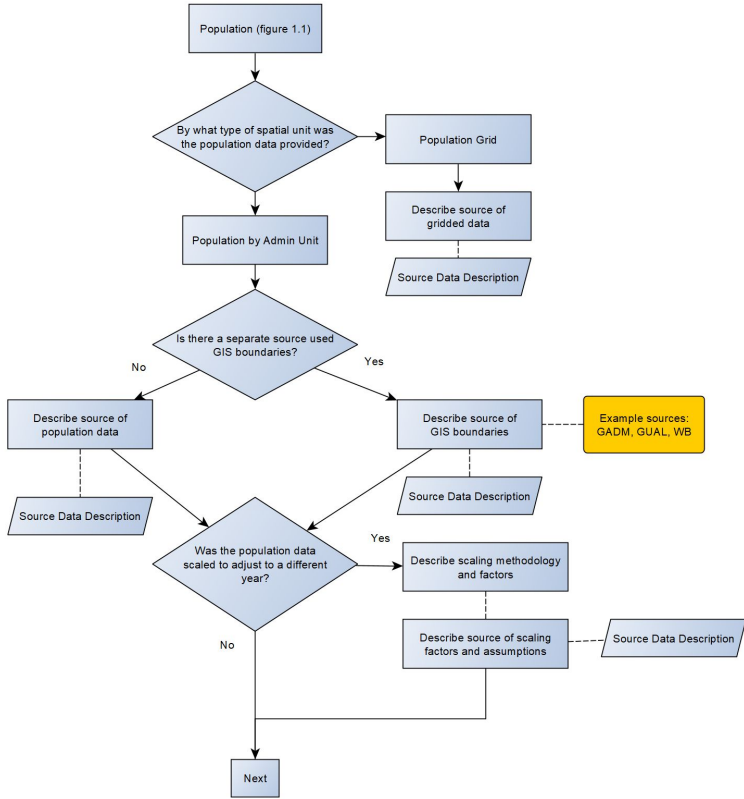# A language for the science of exposure development

•<u>Illuminate the process-</u> Develop robust methods of representing exposure assumptions with respect to vintage, progeny, resolution, and limitations- particularly when fusing multiple datasets collected over a considerable period of time.

•<u>Acknowledge the uncertainty-</u> Establish methods of characterizing the uncertainty of exposure datasets through the incorporation of modeling techniques. It is particularly important that end users understand uncertainties in key factors such as location, the taxonomy, and replacement cost before data use.

Documentation and metadata

Replacement Cost (figure 3.8)

Are the replacement costs estimated or are they site-specific assessments?

Site-specific Assessment → Describe the method of site-specific assessment

Estimate

Was the replacement cost estimated based on square footage and occupancy?

No → Describe the sources and methods of estimation → Source Data Description

Yes → Describe the sources and methods of estimation → Source Data Description

Are there any additional regions to specify?

e.g. Next Administrative Unit
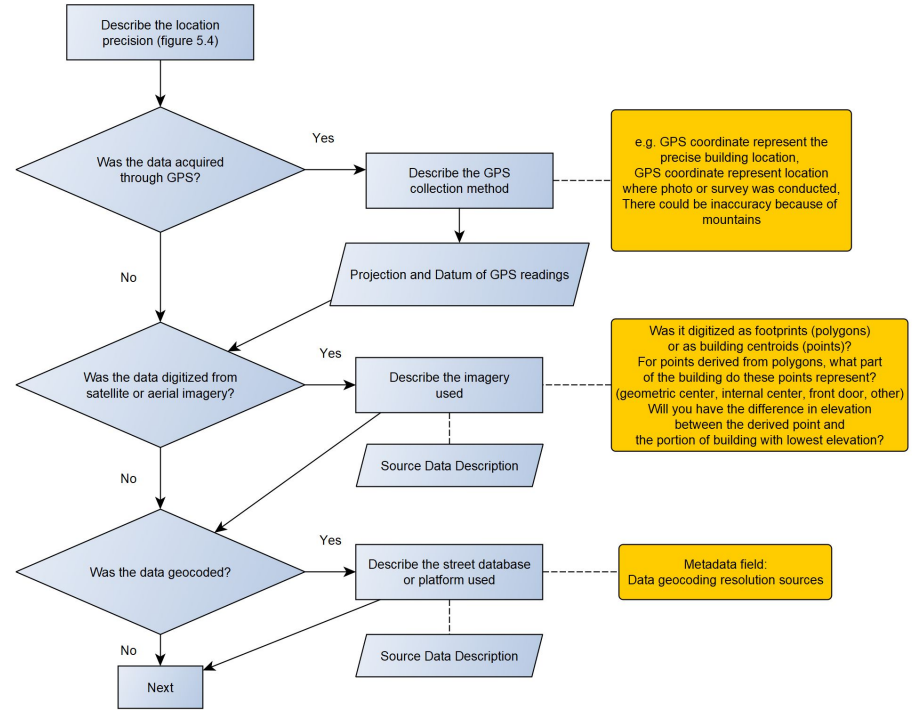
Yes → Specify Geography

No → Next

https://meteor-project.org

Example Flowcharts for Different Exposure Levels

Exposure Level 1 – Population Flowchart

Exposure Level 5 – Location Precision Flowchart

https://meteor-project.org

ICS > 35 > 35.240 > 35.240.70

ISO/TS 19139:2007

Geographic information — Metadata — XML schema implementation

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ICS > 35 > 35.240 > 35.240.70

ISO 19110:2005

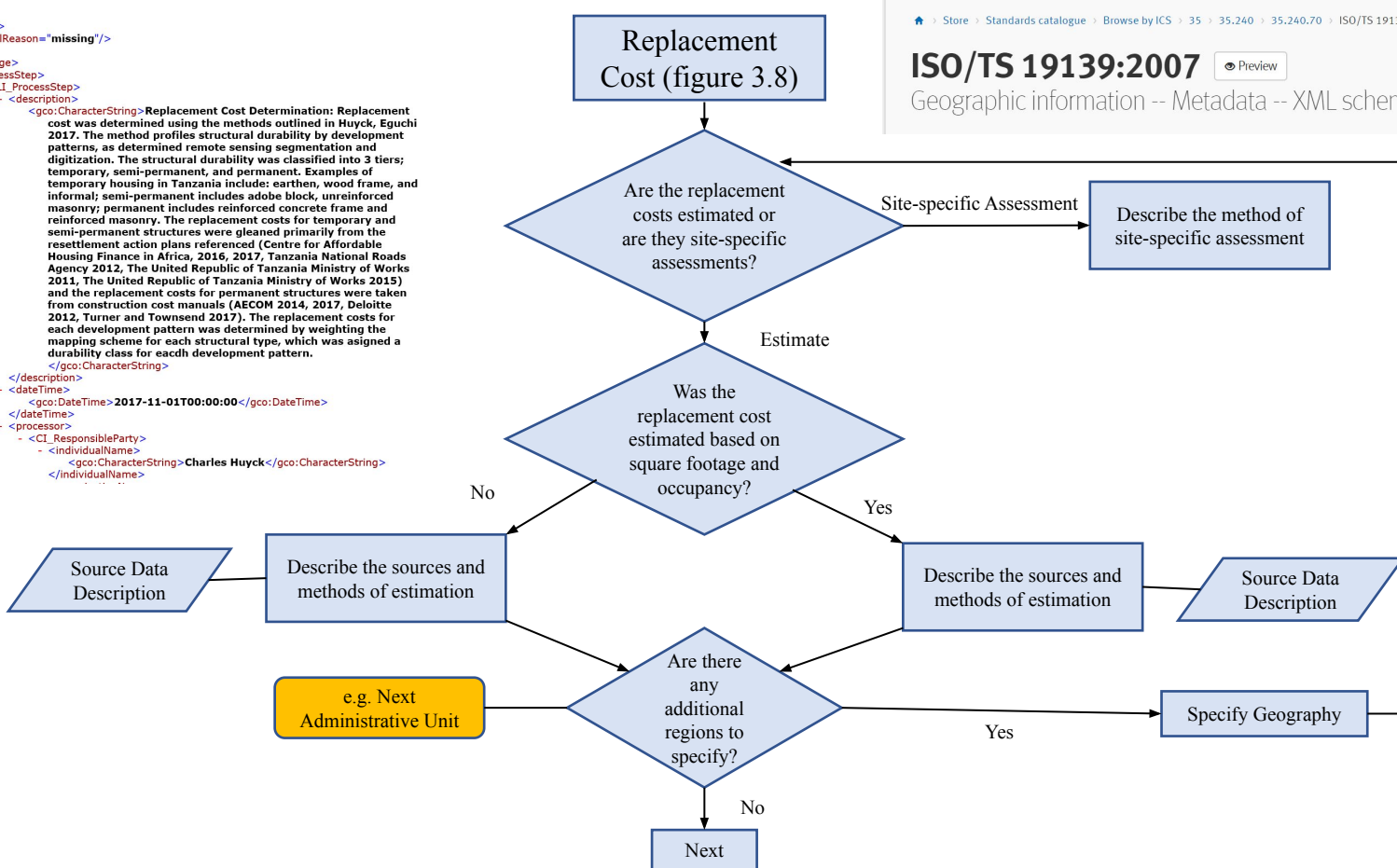Geographic information — Methodology for feature cataloguing

```xml
</distributionInfo>
- <dataQualityInfo>
  - <DQ_DataQuality>
      <scope gco:nilReason="missing"/>
    - <lineage>
      - <LI_Lineage>
        - <processStep>
          - <LI_ProcessStep>
            - <description>
                <gco:CharacterString>Replacement Cost Determination: Replacement
                cost was determined using the methods outlined in Huyck, Eguchi
                2017. The method profiles structural durability by development
                patterns, as determined remote sensing segmentation and
                digitization. The structural durability was classified into 3 tiers;
                temporary, semi-permanent, and permanent. Examples of
                temporary housing in Tanzania include: earthen, wood frame, and
                informal; semi-permanent includes adobe block, unreinforced
                masonry; permanent includes reinforced concrete frame and
                reinforced masonry. The replacement costs for temporary and
                semi-permanent structures were gleaned primarily from the
                resettlement action plans referenced (Centre for Affordable
                Housing Finance in Africa, 2016, 2017, Tanzania National Roads
                Agency 2012, The United Republic of Tanzania Ministry of Works
                2011, The United Republic of Tanzania Ministry of Works 2015)
                and the replacement costs for permanent structures were taken
                from construction cost manuals (AECOM 2014, 2017, Deloitte
                2012, Turner and Townsend 2017). The replacement costs for
                each development pattern was determined by weighting the
                mapping scheme for each structural type, which was asigned a
                durability class for eacdh development pattern.
                </gco:CharacterString>
              </description>
            - <dateTime>
                <gco:DateTime>2017-11-01T00:00:00</gco:DateTime>
              </dateTime>
            - <processor>
              - <CI_ResponsibleParty>
                - <individualName>
                    <gco:CharacterString>Charles Huyck</gco:CharacterString>
                  </individualName>
```
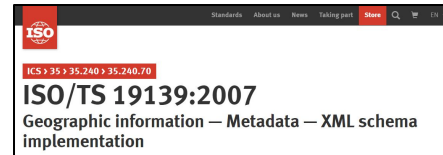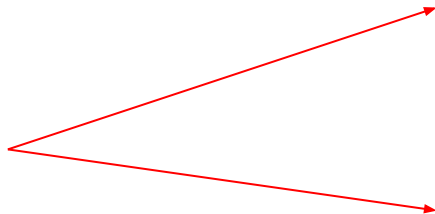
ISO/TS 19139:2007 ⊚ Preview

Geographic information -- Metadata -- XML schema implementation

Creating the Metadata Documents

Use ArcCatalog to develop the metadata

Can export as both ISO-19139 and ESRI Native Metadata Format, to reach the widest audience
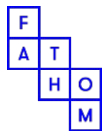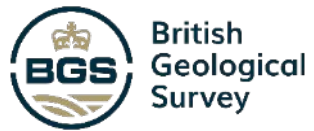
What useful things can you find in the metadata?

- Mapping Scheme and Development Pattern definitions
- Detailed country-specific source data information and references
- Detailed country-specific processing steps
- Replacement Cost information
- Data field descriptions
- Limitations
- Contact information

<xml />

```xml
- <processStep>
   - <LI_ProcessStep>
      - <description>
         <gco:CharacterString>Population Data processing: The population values are from the national level 2020
            Total population estimates from the United Nations World Population Prospects. Population is converted
            to an estimate of the number of households using the national average estimates of persons per
            household at the country level collected from various sources including IPUMS (Minnesota Population
            Center, 2019), national census, and the UN population database. The national level population and
            household values were mapped to the national statistics and IPUMS then interpolated to a 15-arcsecond
            (~500m) grid cell and used to infer the number of buildings. Administrative GIS data was not used to
            aggregate or allot population or buildings but GADM administrative levels 1 (national), 2 (state), and 3
            (county or district) names and numeric code are added to the final result for ease of use by data users.
         </gco:CharacterString>
      </description>
   </LI_ProcessStep>
</processStep>
```

British Geological Survey | GEM | HOT | ImageCat | NSET | Oxford Policy Management | METEOR

Thank You.