

Recommendation for DQO e-Reporting from air quality models



Presentation plan

- FAIRMODE & AQ e-Reporting interactions
- Recommendation on DQO reporting (E1b)
- What's next



FAIRMODE & AQ e-Reporting interactions

- **2013 - 2014** FAIRMODE recommends formats, projections and code lists for AQ e-Reporting; discussions on reporting formats & projections,
- **2015 - 2016** FAIRMODE's initiates European Composite Maps from models, EEA/ETC-ACM extends ETL capacities & proposes user guide on E1b reporting which harmonises the XML structure,
- **2017 - 2018** all countries reporting E1b use the harmonised XML structure, EEA/ETC-ACM prepares DB schema & processing concept for E1b data, FAIRMODE includes AQ interpolated maps in Composite Maps, **AQ e-Reporting recommends Delta Tool for DQO reports in E1b.**



Delta Tool for DQO reports in E1b

- There is already harmonised XML structure to report result quality:

```
▼<om:resultQuality>
  ▼<gmd:DQ_DomainConsistency>
    ▼<gmd:result>
      ▼<gmd:DQ_QuantitativeResult>
        ▼<gmd:valueUnit>
          ▼<gml:BaseUnit gml:id="PercentageUnit_3c9258dc-10ce-4b4b-bbbc-97bb1aeaeb2c">
            <gml:identifier codeSpace="http://dd.eionet.europa.eu/vocabulary/eq/resultquality/uncertaintyestimation/"><25%</gml:identifier>
            <gml:catalogSymbol codeSpace="http://dd.eionet.europa.eu/vocabulary/uom/statistics/percentage">%</gml:catalogSymbol>
            <gml:unitsSystem xlink:href="http://www.opengis.net/def/uom/UCUM"/>
          </gml:BaseUnit>
        </gmd:valueUnit>
        ▼<gmd:value>
          <gco:Record>not available</gco:Record>
        </gmd:value>
      </gmd:DQ_QuantitativeResult>
    </gmd:result>
  </gmd:DQ_DomainConsistency>
</om:resultQuality>
```



Delta Tool for DQO reports in E1b

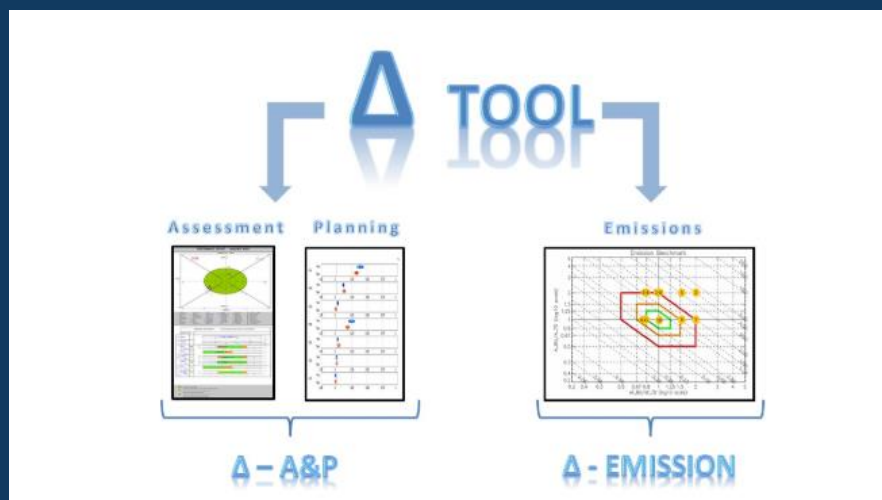
- Harmonised methodology, however, is still missing in AQ e-Reporting...

```
▼<om:resultQuality>
  ▼<gmd:DQ_DomainConsistency>
    ▼<gmd:result>
      ▼<gmd:DQ_QuantitativeResult>
        ▼<gmd:valueUnit>
          ▼<gml:BaseUnit gml:id="PercentageUnit_126">
            <gml:identifier codeSpace="http://dd.eionet.europa.eu/vocabularies/eq/resultquality/">uncertaintyEstimation</gml:identifier>
            <gml:catalogSymbol codeSpace="http://dd.eionet.europa.eu/vocabulary/uom/statistics/">percentage</gml:catalogSymbol>
            <gml:unitsSystem xlink:href="http://www.opengis.net/def/uom/UCUM"/>
          </gml:BaseUnit>
        </gmd:valueUnit>
        ▼<gmd:value>
          <gco:Record>notAvailable</gco:Record>
        </gmd:value>
      </gmd:DQ_QuantitativeResult>
    </gmd:result>
  </gmd:DQ_DomainConsistency>
</om:resultQuality>
```



Delta Tool for DQO reports in E1b

- but it exists within FAIRMODE:



Delta Tool for DQO reports in E1b

- How to use **output from Delta Tool** for DQO e-Reporting in E1b?

Overall MQI

Statistics given for each
sampling point

(will be reported in E1b XML)

(will be reported as external csv file)



Delta Tool for DQO reports in E1b

- XML structure for **om:resultQuality** consists of two parts:

```
<om:resultQuality>  
  <gmd:DQ_DomainConsistency>  
    <gmd:result>  
      <gmd:DQ_ConformanceResult>  
        <gmd:specification>  
          <gmd:CI_Citation>  
            <gmd:title>  
              <gco:CharacterString>FAIRMODE Model Quality Objective (MQO) - annual frequency</gco:CharacterString>  
            </gmd:title>  
            <gmd:date>  
              <gmd:CI_Date>  
                <gmd:date>  
                  <gco:Date>2018</gco:Date>  
                </gmd:date>  
                <gmd:dateType>  
                  <gmd:CI_DateTypeCode codeListValue="revision" codeList="eng" revision date</gmd:CI_DateTypeCode>  
                </gmd:dateType>  
              </gmd:CI_Date>  
            </gmd:date>  
            <gmd:edition>  
              <gco:CharacterString>FAIRMODE Delta Tool version 5.4</gco:CharacterString>  
            </gmd:edition>  
          </gmd:CI_Citation>  
        </gmd:specification>  
        <gmd:explanation>  
          <gco:CharacterString>Estimate of model quality based on the model quality indicator (MQI) derived from the FAIRMODE Delta Tool for hourly model observations. For e-Reporting, the MQI-hourly shall be less than 1.</gco:CharacterString>  
        </gmd:explanation>  
        <gmd:pass>  
          <gco:Boolean>true</gco:Boolean>  
        </gmd:pass>  
      </gmd:DQ_ConformanceResult>  
    </gmd:result>  
  </gmd:DQ_DomainConsistency>  
</om:resultQuality>
```

descriptive part

```
<om:resultQuality>  
  <gmd:DQ_QuantitativeAttributeAccuracy>  
    <gmd:result xlink:href="#myDeltaToolOutputs.csv" xlink:title="FAIRMODE Delta Tool outputs on modelling uncertainty - location is relative to that of the XML instance document,">  
      <gmd:DQ_QuantitativeResult>  
        <gmd:valueUnit>  
          <gml:BaseUnit gml:id="BaseUnit_2">  
            <gml:identifier codeSpace="FAIRMODE">mqi-annual</gml:identifier>  
            <gml:catalogSymbol codeSpace="FAIRMODE">none</gml:catalogSymbol>  
            <gml:unitSystem xlink:href="http://sd.isionet.europa.eu/vocab/aries"/>  
          </gml:BaseUnit>  
        </gmd:valueUnit>  
        <gmd:value>  
          <gco:Record/></gco:Record>  
        </gmd:value>  
      </gmd:DQ_QuantitativeResult>  
    </gmd:result>  
  </gmd:DQ_QuantitativeAttributeAccuracy>  
</om:resultQuality>
```

*part with MQI value,
references*



Delta Tool for DQO reports in E1b

- XML structure for **om:resultQuality**, descriptive part:

```
<om:resultQuality>
  <gmd:DQ_DomainConsistency>
    <gmd:result>
      <gmd:DQ_ConformanceResult>
        <gmd:specification>
          <gmd:CI_Citation>
            <gmd:title>
              <gco:CharacterString>FAIRMODE Model Quality Objective (MQO) - annual frequency</gco:CharacterString>
            </gmd:title>
            <gmd:date>
              <gmd:CI_Date>
                <gmd:date>
                  <gco:Date>2018</gco:Date>
                </gmd:date>
                <gmd:dateType>
                  <gmd:CI_DateTypeCode codeListValue="revision" codeList="eng">revision date</gmd:CI_DateTypeCode>
                </gmd:dateType>
              </gmd:CI_Date>
            </gmd:date>
            <gmd:edition>
              <gco:CharacterString>FAIRMODE Delta Tool version 5.4</gco:CharacterString>
            </gmd:edition>
          </gmd:CI_Citation>
        </gmd:specification>
        <gmd:explanation>
          <gco:CharacterString>
            Estimate of model quality based on the model quality indicator (MQI) derived from the FAIRMODE Delta Tool for hourly model observations. For e-Reporting, the MQI-hourly shall be less than 1.
          </gco:CharacterString>
        </gmd:explanation>
        <gmd:pass>
          <gco:Boolean>true</gco:Boolean>
        </gmd:pass>
      </gmd:DQ_ConformanceResult>
    </gmd:result>
  </gmd:DQ_DomainConsistency>
</om:resultQuality>
```



Delta Tool for DQO reports in E1b

- XML structure for **om:resultQuality**, MQI value, references:

```
<om:resultQuality>
  <gmd:DQ_QuantitativeAttributeAccuracy>
    <gmd:result xlink:href="/myDeltaToolOutputs.csv" xlink:title="FAIRMODE Delta Tool outputs on modelling uncertainty - location is relative to that of the XML instance document.">
      <gmd:DQ_QuantitativeResult>
        <gmd:valueUnit>
          <gml:BaseUnit gml:id="BaseUnit_2">
            <gml:identifier codeSpace="FAIRMODE">MQI-annual</gml:identifier>
            <gml:catalogSymbol codeSpace="FAIRMODE">none</gml:catalogSymbol>
            <gml:unitsSystem xlink:href="http://dd.eionet.europa.eu/vocabularies"/>
          </gml:BaseUnit>
        </gmd:valueUnit>
        <gmd:value>
          <gco:Record>1</gco:Record>
        </gmd:value>
      </gmd:DQ_QuantitativeResult>
    </gmd:result>
  </gmd:DQ_QuantitativeAttributeAccuracy>
</om:resultQuality>
```



What's next:

- **Section on E1b XML structure for recommended DQO reporting** using Delta Tool will be **added to the User Guide on XML**,
- **Link to** the FAIRMODE website with **Delta Tool** will be provided on AQ Portal,
- **Processing** concept will be elaborated by EEA/ETC-ACM **for the recommended DQO reporting**.
- Further recommendations e.g. on using sampling points reported in AQ e-Reporting for E1b quality validations.



Thank you for your attention!

