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# ISO Dates

From NOAA Environmental Data Management Wiki

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There are many dates included in the ISO Metadata Standards and they have several different types - each with its own characteristics. This page has information about valid formats for those dates.

Ron Lake's blog includes a helpful [description](http://www.galdosinc.com/archives/151) of time in GML.

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## gco:Date Type

Date: gives values for year, month and day. Character encoding of a date is a string which shall follow the format for date specified by [ISO 8601](http://en.wikipedia.org/wiki/ISO_8601). A full date is formatted as YYYYMMDD or YYYY-MM-DD. This type is used in the following fields:

* MI\_Metadata.dateStamp - The ISO definition of this field is "date that the metadata was created". Common usage seems to be evolving towards "date that the metadata was created or updated" because it seems reasonable that, once the metadata have been updated, the date of that update is more interesting than the original creation date. Also, the update actually creates the current metadata, so this usage seems consistent with the ISO definition. Finally, the MD\_MaintenanceInformation object does not include a dateOfLastUpdate field.
* MD\_MaintenanceInformation.dateOfNextUpdate
* CI\_Citation.editionDate - The ISO edition field is synonymous with the concept of version, so this is the release date for the version of the resource being cited.

## gco:DateTime Type

DateTime: combination of a date and a time type (given by an hour, minute and second). Character encoding of a DateTime shall follow [ISO 8601](http://en.wikipedia.org/wiki/ISO_8601). Combined dates and times should be formatted as YYYYMMDDThh:mm:ss, YYYYMMDDThhmmss, or YYYY-MM-DDThh:mm:ss. These representations include no TimeZone indicator, so they are assumed to be local time. YYYYMMDDThh:mm:ssZ would indicate universal time.

* MD\_Usage.usageDateTime
* DQ\_Element.dateTime
* LI\_ProcessStep.dateTime
* MD\_StandardOrderProcess.plannedAvailableDateTime

<gmd:dateTime>

<gco:DateTime>2001-01-01T00:00:00</gco:DateTime>

</gmd:dateTime>

Note: This element was incorrectly defined in the ISO 19139 nschema as an xs:dateTime. That type does not allow all of the ISO 8601 options. Specifically, it does not allow the specification of a time range. It will likely be deprecated in the revision of the standard and replaced with stepDateTime.

## gmd:CI\_Date Type

This type is used only in the CI\_Citation and is the only date type that includes a code from the CI\_DateTypeCode codelist. Valid values from the CI\_DateTypeCode CodeList are: creation (001), publication (002), and revision (003).

* CI\_Citation.date.CI\_Date.date

<gmd:CI\_Date>

<gmd:date>

<gco:Date>2000-01-01</gco:Date>

</gmd:date>

<gmd:dateType>

<gmd:CI\_DateTypeCode

codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI\_DateTypeCode"

codeListValue="creation">creation</gmd:CI\_DateTypeCode>

</gmd:dateType>

</gmd:CI\_Date>

## On-Going Datasets

Many datasets are collected continuously through time. In these cases, a clear publication date does not exist. This situation can be indicated by a combination of "inapplicable" for the citation date, a status code = onGoing, and an endPosition with indeterminatePosition=now:

<gmd:date>

<gmd:CI\_Date>

<gmd:date gco:nilReason="inapplicable"/>

<gmd:dateType>

<gmd:CI\_DateTypeCode codeList="http://www.isotc211.org/2005/resources/Codelist/gmxCodelists.xml#CI\_DateTypeCode"

codeListValue="publication">publication</gmd:CI\_DateTypeCode>

</gmd:dateType>

</gmd:CI\_Date>

</gmd:date>

...

<gmd:status>

<gmd:MD\_ProgressCode codeListValue="onGoing" codeList="http://www.isotc211.org/2005/resources

/codeList.xml#MD\_ProgressCode">onGoing</gmd:MD\_ProgressCode>

</gmd:status>

...

<gmd:temporalElement>

<gmd:EX\_TemporalExtent id="boundingTemporalExtent">

<gmd:extent>

<gml:TimePeriod gml:id="d1e50">

<gml:beginPosition>2003-01-18T00:23:00.000Z</gml:beginPosition>

<gml:endPosition indeterminatePosition="now"/>

</gml:TimePeriod>

</gmd:extent>

</gmd:EX\_TemporalExtent>

</gmd:temporalElement>

## Relative Times

In some situations it is necessary to express a time in terms of a fixed period before the present. For example, on-going data processing systems might use observation sets and products from the previous day in the creation of a product for today. In these cases the duration and the end of the time period are known, so the XML looks like:

<gmd:temporalElement>

<gmd:EX\_TemporalExtent>

<gmd:extent>

<gml:TimePeriod gml:id="id">

<gml:beginPosition indeterminatePosition="now"/>

<gml:endPosition indeterminatePosition="now"/>

<gml:duration>P1D</gml:duration>

</gml:TimePeriod>

</gmd:extent>

</gmd:EX\_TemporalExtent>

</gmd:temporalElement>

See [ISO 8601](http://en.wikipedia.org/wiki/ISO_8601) for information on durations.

## Uncertain Times

The GML elements for describing time positions (beginPosition and endPosition) include the indeterminatePosition attribute that can have values of before, after, now, and unknown. This attribute can be used with a time value to express uncertain times. For example, a dataset that began sometime before 1980 and continues to the present could be described as:

<gmd:extent>

<gml:TimePeriod gml:id="id">

<gml:beginPosition indeterminatePosition="before">1980</gml:beginPosition>

<gml:endPosition indeterminatePosition="now"/>

</gml:TimePeriod>

</gmd:extent>

## Translating FGDC Dates

The FGDC Standard allows a variety of date representations including "Free Date" in many locations. A number of assumptions must be made in order to translate these dates into the more structured formats required by ISO. If using XSLT's to translate FGDC date content to ISO (such as the NOAA transforms), logic must be added to achieve the highest level of interoperability and and highest rate of valid ISO input. These assumptions might be based on the length of the FGDC date string:

4 characters = YYYY

6 characters = YYYYMM or bcYYYY

7 characters = 'unknown'

8 characters = YYYYMMDD or bcYYYYMM

10+ characters = bcYYYYMMDD or ccYYYYYYY... or cdYYYYYYY...

This DECODE query is used in selecting dates dates with YYYYMMDD, YYYYMM and YYYY formats from Oracle (other formats are invalid):

decode(LENGTH(DATETIME),6,'<gml:Date>'||SUBSTR(DATETIME,1,4)||'-'||SUBSTR(DATETIME,5,2)||'</gml:Date>',8,'<gml:Date>'||DATETIME||'</gml:Date>',4,'<gml:Date>'||DATETIME||'</gml:Date>','<gml:Date>"'||DATETIME||'" is an invalid date format</gml:Date>')DATETIME

Other assumptions must be made as well such as

- accounting for non-standard dates

- accounting for various capilatizations such as 'Unknown' or 'unknown' or 'UNKNOWN'

- accounting for common misspellings such as 'unkown', 'unknow' ,'unkwon', etc.

- accounting for extra spaces

- accounting for input dates that start with bc, cc, or cd

The indeterminatePosition can be used in a couple of cases if the date is unknown or unpublished

<gml:timePosition indeterminatePosition="unknown">

<gml:timePosition indeterminatePosition="now">

If the date can not be recognized, set it as a reason for having no date:

<gmd:dateTime gco:nilReason="Date Content"/>.

Of course, many of these will not be valid values for nilReason so they will be identified as problems during record validation. For the NOAA transforms, if a date is missing or cannot not be determined, gco:nilReason will be set to 'unknown' by default. Ending dates of 'present' and 'unknown' (also taking