

Statens kartverk Sjø/Norwegian Hydrographic Office			Dok.id.: IV.2.2.2.5-7
API for water level data. Communication protocol			Standarder
Version: 4.01	Valid from: 08.05.2017	Prepared by: Egil Sølvsberg	Approved by: []
			Sidenr: 1 av 16

All requests are an URL with parameters.

All times are in ISO-8601 format (2005-08-15T15:52:01+01). Times will be Norwegian standard time (UTC+1) if no particular time zone is requested. The time zone designation will always be present.

The parameter names and station codes may be upper or lower case letters, and in any order. Some parameters are optional. If not specified, default values will be used.

All coordinates are geographical latitude and longitude, datum is EUREF89. Values are in decimal degrees.

A period (.) is used as decimal separator in all numbers.

All requests returning a user visible text must contain the «lang» parameter if any other language than «Nynorsk» is wanted. It is possible to ask for [available languages](#). All requests will give a XML response, unless file response is selected.

Systems using the API must accept the existence of new (unknown) fields or parameters for any xml-answer.

In texts the letter & will be substituted with **&** , < will be substituted with **<** , > with **>** , ' with **'** and " with **"**; (xml standard requirement).

Comments and suggestions are welcome. Contact tidevann@kartverket.no .

Url to a test page: http://api.sehavniva.no/tideapi_en.html or http://api.sehavniva.no/tideapi_no.html .

Please read the terms of use: <http://kartverket.no/en/data/Terms-of-use/> or <http://kartverket.no/data/Lisens/>

Changes:

21. oktober 2015	Added Ocean Level Change
10.december 2016	Added selection of reference level group. Changes in info of Water level at position. Reference level is not optional any more.
5.may 2017	Added tide zone information

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Station list

Returns a list of stations currently available to the public. More stations (about 800) will be available in the future (not planned in 2015).

URL: http://api.sehavniva.no/tideapi.php?tide_request=stationlist&type=perm

type (optional, default value = PERM):

PERM for permanent water level stations
 CURRENT for ocean current stations
 TEMP for stations containing temperature series
 PUBLIC for all available water level stations

Response example:

```
<tide>
  <stationinfo>
    <station name="Andenes" code="ANX" latitude="69.326067" longitude="16.134848" type="PERM"/>
    <station name="Bergen" code="BGO" latitude="60.398046" longitude="5.320487" type="PERM"/>
    <station name="Bodø" code="BOO" latitude="67.28829" longitude="14.390813" type="PERM"/>
    <station name="Hammerfest" code="HFT" latitude="70.664641" longitude="23.683227" type="PERM"/>
    <station name="Harstad" code="HAR" latitude="68.801261" longitude="16.548236" type="PERM"/>
    <station name="Heimsjø" code="HEI" latitude="63.425224" longitude="9.101504" type="PERM"/>
    <station name="Helgeroa" code="HRO" latitude="58.995212" longitude="9.856379" type="PERM"/>
    <station name="Honningsvåg" code="HVG" latitude="70.980318" longitude="25.972697" type="PERM"/>
    <station name="Kabelvåg" code="KAB" latitude="68.212639" longitude="14.482149" type="PERM"/>
    <station name="Kristiansund" code="KSU" latitude="63.113859" longitude="7.734352" type="PERM"/>
    <station name="Mausund" code="MSU" latitude="63.86933" longitude="8.66523" type="PERM"/>
    <station name="Måløy" code="MAY" latitude="61.933776" longitude="5.11331" type="PERM"/>
    <station name="Narvik" code="NVK" latitude="68.428286" longitude="17.425759" type="PERM"/>
    <station name="Ny-Ålesund" code="NYA" latitude="78.928545" longitude="11.938015" type="PERM"/>
    <station name="Oscarsborg" code="OSC" latitude="59.678073" longitude="10.604861" type="PERM"/>
    <station name="Oslo" code="OSL" latitude="59.908559" longitude="10.73451" type="PERM"/>
    <station name="Rørvik" code="RVK" latitude="64.859456" longitude="11.230107" type="PERM"/>
    <station name="Stavanger" code="SVG" latitude="58.974339" longitude="5.730121" type="PERM"/>
    <station name="Tregde" code="TRG" latitude="58.006377" longitude="7.554759" type="PERM"/>
    <station name="Tromsø" code="TOS" latitude="69.647424" longitude="18.961323" type="PERM"/>
    <station name="Trondheim" code="TRD" latitude="63.436484" longitude="10.391669" type="PERM"/>
    <station name="Vardø" code="VAW" latitude="70.374978" longitude="31.104015" type="PERM"/>
    <station name="Viker" code="VIK" latitude="59.036046" longitude="10.949769" type="PERM"/>
    <station name="Ålesund" code="AES" latitude="62.469414" longitude="6.151946" type="PERM"/>
  </stationinfo>
</tide>
```

The list will be sorted by station name. As of June 2015 only permanent stations are available.

name: The station name. May not be unique. May change.
 code: Unique station code. To be used in subsequent request. This code will not change. Upper or lower case may be used.
 latitude: latitude of position (degrees, positive north of equator)
 longitude: longitude of position (degrees, positive east of Greenwich)
 type: Station type: PERM permanent station
 ACTIVE temporary station currently active
 SECOND secondary station. With a constituent set
 CURRENT current measurement stations (not water level)

The field will be empty for other stations

Standard levels

Recommended standard levels are the levels recommended to be used in a selection menu on a web page for display of tide and water level. Request for water level data should use these codes. You may select language for the names and descriptions.

Norway is changing national height reference system from NN1954 to NN2000. This will take some time. When NN2000 is established in an area, NN1954 will not be available in that area. If the request for standard levels includes position, the recommended standard levels for that position will be returned. An invalid position will be ignored. If no position is supplied, only Mean Sea Level and Chart Datum will be returned. But Chart Datum data will not be available everywhere, so use of relevant position is recommended.

URL: `http://api.sehavniva.no/tideapi.php?tide_request=standardlevels&lang=nb
&lat=63.9&lon=9.4;`

lang (optional, default value = nn): language to be used for names and descriptions
(selection see [Available languages](#))

lat: (optional) latitude of position (degrees, positive north of equator)

lon: (optional) longitude of position (degrees, positive east of Greenwich)

Response example:

```
<tide>
  <standardlevels>
    <reflevel code="CD" name="Sjøkartnull" descr="Referansenivå for dybder i sjøkartene og høyder i tidevannstabellen"/>
    <reflevel code="MSL" name="Middelvann" descr="Gjennomsnittlig høyde av sjøens overflate på et sted over en periode på 19
år"/>
    <reflevel code="NN1954" name="NN 1954" descr="Normalnull 1954. Vertikalt datum for det nasjonale høydesystemet i Norge"/>
  </standardlevels>
</tide>
```

code: level code

name: name of level in the selected language

descr: description of level in the selected language. May be used as “mouse over”
information

Station levels

Levels of a station. New levels may be added and levels may be removed at any time. The list will be sorted with largest value first.

URL: http://api.sehavniva.no/tideapi.php?tide_request=stationlevels&lang=en&file=pdf&refcode=cd&stationcode=OSL

lang (optional, default value = nn): language (selection see [Available languages](#))
 refcode: code of reference level, the zero level in the response. Any existing level of the station may be used
 file (optional): file type for downloading. Selection pdf will return a drawing. See [Available file formats](#)
 stationcode: the unique station code (as returned by the [Station list](#) request)

Response example:

```
<tide>
  <stationlevels unit="cm" reflevel="CD" >
    <location name="ANDENES" code="ANX" landlift="0.12"/>
    <reflevel code="HOWL" value="66.5" name="Highest Observed Water Level" type="OBS"/>
    <reflevel code="HAT" value="0" name="Highest Astronomical Tide" type="ASTROREF"/>
    <reflevel code="MHWS" value="-36" name="Mean High Water Spring" type="ASTRO"/>
    <reflevel code="MHW" value="-58.5" name="Mean High Water" type="ASTROREF"/>
    <reflevel code="MHWN" value="-81" name="Mean High Water Neap" type="ASTRO"/>
    <reflevel code="NN1954" value="-119.5" name="NN 1954" type="REF"/>
    <reflevel code="MSL" value="-125" name="Mean Sea Level" type="REF"/>
    <reflevel code="MLWN" value="-169" name="Mean Low Water Neap" type="ASTRO"/>
    <reflevel code="MLW" value="-191.5" name="Mean Low Water" type="ASTRO"/>
    <reflevel code="MLWS" value="-214" name="Mean Low Water Spring" type="ASTRO"/>
    <reflevel code="LAT" value="-254" name="Lowest Astronomical Tide"/>
    <reflevel code="CD" value="-254" name="Chart datum" descr="Reference level for depths in
      navigational charts and heights in tide tables" type="REF"/>
    <reflevel code="LOWL" value="-283.5" name="Lowest Observed Water Level" type="OBS"/>
  </stationlevels>
</tide>
```

landlift: land uplift per year
 code: reference level code
 unit: the unit of all values. Usually cm.
 value: level value. If elliptic height (euref89) is defined for this station that level may be minus 50 m.
 name: reference level name in selected language
 descr: description of level in selected language. May be used as “mouse over” information
 type: level group this level belongs to
 ASTRO astronomical levels
 ASTROREF
 OBS highest and lowest observed level
 REF reference levels
 ADM safety levels defined in construction regulations (TEK10)
 RETURN statistical return levels (1, 2, 5, 10, 20, 50, 100, 200, 500, 1000 years)

Today there exists 33 possible levels. No station will have all levels.

Levels at position

The Norwegian coast has about 600 tide zones. All zones have assigned a permanent station as reference station. The astronomical levels from the reference station will be scaled with the multiplication factor. Some parameters are the same as the ones used for [Station levels](#).

URL: `http://api.sehavniva.no/tideapi.php?tide_request=locationlevels&lang=en
&lat=63.9&lon=9.4&place=Egersund&refcode=cd&file=pdf&flag=adm,astro,return`

lat: latitude of position (degrees, positive north of equator)
lon: longitude of position (degrees, positive east of Greenwich)
place (optional): if error messages and pdf file shall show the place name of the position, this parameter must be used
lang (optional, default value = nn): language (selection see [Available languages](#))
refcode: code of reference level, the zero level in the response. Any existing level of the area may be used
flag (optional) if omitted all available levels will be returned. If used only specified group will be returned (use , (comma) to add group codes). Some reference levels will always be returned.
obs = maximum and minimum observed water level
adm = administrative group, levels defined in construction regulations
astro = astronomical levels
astroref = highest astronomical and mean high water level
return = statistical return levels (1, 5, 10, 20, 50, 100, 200, 500, 1000 years)
file (optional): file type for downloading. File=pdf will return a drawing. See [Available file formats](#)

The response will be similar to to the response for [Station levels](#)

```
<location latitude="63.9" longitude="9.4" delay="-15" factor=".98" name="Rørvik" code="RVK"  
code="OLE" obsname="Bergen" obscode="BGO"/>
```

name: name of the station where predictions are calculated from
code: code of this station
obsname: name of station where the observed water levels are measured
obscode: code of this station
delay: time delay (minutes) relative to the reference station
factor: multiplication factor for levels from the reference station

If the position is outside the tide zones, but inside the tide model for the ocean areas, there will be a normal response. But factor, name and code will not be part of the response.

If no data or incomplete data is found at the position the answer will be something like:

```
<tide>  
<locationlevel>  
<nodata info="Sorry. There are no sea level data for Egersund. The area between Lista and Tananger  
does not have sufficient data."/>  
</locationlevel>  
</tide>
```

The information text will change depending of the position. The text may be tailored to a specific zone or offshore area. If the “place” parameter is empty, the position will be used in the text (in the example “Egersund” will be replaced by the position). The text will be in the requested language.

Tide constituents

URL: http://api.sehavniva.no/tideapi.php?tide_request=constituents&stationcode=TOS&lat=60&lon=1

stationcode: the unique code for the station (as returned by the [Station list](#) request). If code=MODEL is used, lat and lon has to be used, and constant set for the ROMS model covering the Norwegian sea will be returned

lat (optional): latitude of position (degrees, positive north of equator). Only for ROMS model

lon (optional): longitude of position (degrees, positive east of Greenwich). Only for ROMS model

Response example:

```
<tide>
  <constituents utcoffset="+01:00" unit="cm">
    <location name="TROMSØ" code="TOS" latitude="69.647424" longitude="18.961323"/>
    <provider name="Statens kartverk sjø" email="tidevann@kartverket.no" web="www.kartverket.no"/>
    <observations end="1997-11-19T00:00:00+01:00" start="1989-01-01T00:00:00+01:00"/>
    <constituent name="SA" doodson="ZZAZZY" speed="0.04106668" phaseangle="326.80" amplitude="12.40"/>
    <constituent name="2Q1" doodson="AWBZZY" speed="12.85428625" phaseangle="304.50" amplitude="0.40"/>
    <constituent name="SIG1" doodson="AWBZZY" speed="12.92713985" phaseangle="331.60" amplitude="0.40"/>
    <constituent name="Q1" doodson="AXZAZZY" speed="13.39866094" phaseangle="5.70" amplitude="1.80"/>
    ...
  </constituents>
</tide>
```

Speed unit is degrees per hour
Phase angle unit is degrees

Time interval of available water level data from this station

This is the time between first and last water level measurement from this station. There may be small or large gaps in the data.

URL: http://api.sehavniva.no/tideapi.php?tide_request=obstime&stationcode=TOS

stationcode: the unique station code (as returned by the [Station list](#) request)

Response example:

```
<tide>
  <obstime code="TOS" first="1986-02-08T14:00:00+01 last="2012-02-08T14:00:00+01"/>
</tide>
```

Year of first and last statistics for station

URL: http://api.sehavniva.no/tideapi.php?tide_request=stattime&stationcode=SVG

stationcode: the unique station code (as returned by the [Station list](#) request)

Response example:

```
<tide>
  <stattime code="SVG" first="1987" last="2013"/>
</tide>
```

Month and year mean, maximum and minimum

URL: http://api.sehavniva.no/tideapi.php?tide_request=monthmean&lang=en&stationcode=TOS&fromtime=2010&totime=2011&refcode=CD&file=pdf

The response also contains yearly minimum and maximum

stationcode:	the unique code for the station (as returned by the Station list request)
fromtime (optional, default=last year):	first year
totime (optional, default=this year):	last year of statistics
file (optional):	a file may be requested (see Available file formats).
lang (optional, default=nn):	language for files or texts (see Available languages)
refcode (optional, default value = CD):	code of reference level, the zero level in the response. Any existing level of the station may be used

Response example:

```
<tide>
  <monthmean refllevel="CD" unit="cm" year="2010">
    <location name="Tromsø" code="TOS"/>
    <mean month="0" value="157.05" days="358" min="-32.58" max="311.39" timemin="2010-09-10T08:20:00+01" timemax="2010-10-10T02:30:00+01"/>
    <mean month="1" value="159.75" days="31" min="-12.35" max="291.69" timemin="2010-01-31T20:20:00+01" timemax="2010-01-03T15:20:00+01"/>
    <mean month="2" value="150.95" days="28" min="-19.7" max="283.64" timemin="2010-02-01T21:10:00+01" timemax="2010-02-01T14:50:00+01"/>
    .....
    <mean month="7" value="156.69" days="31" min="-14.29" max="282.72" timemin="2010-07-15T09:40:00+01" timemax="2010-07-13T01:50:00+01"/>
    <mean month="8" value="157.43" days="25" min="6.65" max="286.83" timemin="2010-08-11T08:00:00+01" timemax="2010-08-11T01:50:00+01"/>
    <mean month="9" value="157.11" days="30" min="-32.58" max="279.05" timemin="2010-09-10T08:20:00+01" timemax="2010-09-11T02:50:00+01"/>
    <mean month="10" value="173.91" days="31" min="2.86" max="311.39" timemin="2010-10-08T07:10:00+01" timemax="2010-10-10T02:30:00+01"/>
    <mean month="11" value="163.79" days="30" min="11.33" max="297.84" timemin="2010-11-27T23:30:00+01" timemax="2010-11-06T13:10:00+01"/>
    <mean month="12" value="156.43" days="30" min="3.26" max="294.25" timemin="2010-12-23T20:50:00+01" timemax="2010-12-06T13:30:00+01"/>
  </monthmean>
  <monthmean refllevel="CD" unit="cm" year="2011">
    <station name="Tromsø" code="TOS"/>
    ....
    ....
    ....
  </monthmean>
</tide>
```

days:	number of days containing data in the month or year
month:	month. Number 0 (zero) contains statistics for the year
reflevel:	reference level
max:	largest level of the month or year
min:	minimum level of the month or year
timemax:	time of maximum level
timemin:	time of minimum level

Water level data in position

The Norwegian coast has about 500 tidal zones. All valid zones have assigned a prediction station. The astronomical tide from the prediction station will be scaled with the multiplication factor. Most zones have also assigned one of the permanent stations as observation station. The weather effect (observations minus predictions) for that observation station is added to the scaled astronomical tide for this position to compute the observations for this position.

URL: http://api.sehavniva.no/tideapi.php?tide_request=locationdata&lat=61&lon=5.5&datatype=PRE&file=pdf&lang=nl&place=Gol&dst=1&refcode=CD&fromtime=2011-10-18T09:00&totime=2011-10-18T11:00&interval=10

lat:	latitude for this position (degrees, positive north of equator)
lon:	longitude for this position (degrees, positive east of Greenwich)
fromtime, totime	if both are omitted, last 24 hours will be used
place (optional):	if error messages and files shall refer to the name of the selected place, this parameter must have a value
datatype (optional, default=all):	TAB = tide table (high tide and low tide) PRE = predictions = astronomic tide OBS = observations = measured water level ALL = both predictions, observations, weathereffect and forecast will be returned.
refcode:	code of reference level, the zero level in the response. Any existing level of the area may be used
interval (optional, default=60):	data interval in minutes, 10 or 60.
file (optional):	a file may be requested (see Available file formats).
lang (optional, default=nn):	language for files or texts (see Available languages)
dst (optional, default=0):	if this parameter is '1' the times will be shown in time zone utc+2 in the daylight savings time period. If value is '2' time in response will be the difference from the time of the first value in series. The value of the start time will be shown as <data reftime="2017-01-26T00:00:00+01:00">
tzone (optional, default=1):	time zone of returned data. Hours from UTC (negative at west longitude)
flag (optional)	flag contains "nosa" : SA constituent is not used in prediction computation

Response example:

```
<tide>
  <service info="We have lost contact with Bergen/>
  <locationdata>
    <location latitude="61" longitude="5.5" sigma="0" delay="-10" factor="1.11" name="Ølen"
      code="OLE" obsname="Bergen" obscode="BGO"/>
    <reflevelcode>CD</reflevelcode>
    <data type="observation" unit="cm">
      <waterlevel value="134.2" time="2011-10-18T09:10:00+01" flag="obs"/>
      <waterlevel value="130.9" time="2011-10-18T09:20:00+01" flag="obs"/>
      <waterlevel value="126.9" time="2011-10-18T09:30:00+01" flag="obs"/>
    </data>
    <data type="prediction" unit="cm">
      <waterlevel value="118.7" time="2011-10-18T09:10:00+01" flag="pre"/>
      <waterlevel value="114.6" time="2011-10-18T09:20:00+01" flag="pre"/>
      <waterlevel value="110.9" time="2011-10-18T09:30:00+01" flag="pre"/>
      <waterlevel value="107.5" time="2011-10-18T09:40:00+01" flag="pre"/>
      <waterlevel value="104.5" time="2011-10-18T09:50:00+01" flag="pre"/>
      <waterlevel value="104.5" time="2011-10-18T10:00:00+01" flag="pre"/>
    </data>
    <data type="weathereffect" unit="cm">
      <waterlevel value="15.5" time="2011-10-18T09:10:00+01"/>
  </locationdata>
</tide>
```

Til en hver tid er datafilen den gyldige versjonen av dette dokumentet.

Utskriftsdato: 31. oktober 2018

```

    <waterlevel value="15.3" time="2011-10-18T09:20:00+01"/>
    <waterlevel value="16.0" time="2011-10-18T09:30:00+01"/>
    <waterlevel value="14.9" time="2011-10-18T09:40:00+01"/>
  </data>
  <data type="forecast" unit="cm">
    <waterlevel value="48.4" time="2011-10-18T09:50:00+01" flag="forecast"/>
    <waterlevel value="47.4" time="2011-10-18T10:00:00+01" flag="forecast"/>
    <waterlevel value="46.4" time="2011-10-18T10:10:00+01" flag="forecast"/>
  </data>
</locationdata>
</tide>

```

name: name of the station where predictions are calculated from
code: code of this station
obsname: name of station where the observed water levels are measured
obscode: code of this station
latitude: latitude of data (not of the station in "name")
longitude: longitude of data
flag: obs = Observation, pre = Prediction (astronomical tide), , high=high water, low=low water, forecast = Forecast from met.no, weathereffect = difference between observation and prediction.
type: observation, prediction, weathereffect or forecast
service: service message if a message is active for this position. Service messages may be in norwegian or english.

Data of type observations may be flagged with 'pre', indicating that a missing measurement has been filled in based on predictions.

Or an error message:

```

<tide>
  <nodata info=" Sorry. There are no sea level data for Geilo because Geilo is too far away from the coast."/>
</tide>

```

See [Levels at position](#) for description of error message.

High and low tide: Tide table as pdf-file

The year may range from 900 to 2100. But tables several hundred years back in time will not be valid in shallow areas, for instance fjords with shallow inlets, because the postglacial land uplift will have changed the conditions of the tide.

URL: http://159.162.103.237/api/tideapi.php?tide_request=tidetable&year=1936&lat=59&lon=5.5&lang=nl&place=Øya

lat: latitude for this position (degrees, positive north of equator)
lon: longitude for this position (degrees, positive east of Greenwich)
year: year of the tide table
place (optional): if the heading of the pdf file shall have a name, this parameter has to have a value
lang (optional, default=nn): language for files or texts (see [Available languages](#))

Ocean level change

URL: http://api.sehavniva.no/tideapi.php?tide_request=searise&lat=63.9&lon=9.4&fromtime=2000&totime=2100&lang=nn

lat: latitude for this position (degrees, positive north of equator)
 lon: longitude for this position (degrees, positive east of Greenwich)
 fromtime (optional, default=1990): start year
 totime (optional, default=2095): last year
 lang (optional, default=nn): language for texts (see [Available languages](#))

Response example:

```
<tide>
  <searise>
    <location latitude="58.970000" longitude="5.730000" unit="cm" replace="Stavanger" area="Tala gjeld for Stavanger kommune"/>
    <model code="RCP4.5" name="Redusert utslepp (RCP4.5)" reftime="1986-2005" desc="RCP4.5 inneber små utsleppsendringar fram
    til 2050 og deretter utsleppskutt">
      <data year="2008" value="3.3" min="-1.5" max="8.1"/>
      <data year="2009" value="2.8" min="-1.6" max="7.2"/>
      <data year="2010" value="3.1" min="-2.2" max="8.3"/>
      .....
      <data year="2033" value="10.2" min="0.9" max="19.4"/>
      <data year="2034" value="11.5" min="2.0" max="20.7"/>
      <data year="2035" value="11.4" min="2.0" max="20.7" mean="12.1" minmean="2.9" maxmean="21.1"/>
      <data year="2036" value="12.1" min="3.7" max="20.4" mean="12.5" minmean="3.1" maxmean="21.7"/>
      <data year="2037" value="13.2" min="3.1" max="23.1" mean="12.8" minmean="3.2" maxmean="22.3"/>
      .....
      <data year="2084" value="33.8" min="12.7" max="54.4" mean="32.7" minmean="11.2" maxmean="53.7"/>
      <data year="2085" value="33.4" min="12.8" max="53.4" mean="33.1" minmean="11.2" maxmean="54.4"/>
      <data year="2086" value="33.5" min="11.2" max="55.3"/>
      <data year="2087" value="34.3" min="12.5" max="55.6"/>
      .....
    </model>
  </searise>
</tide>
```

unit: unit of lift values. Usually cm
 code: code of model. Today (2015) three models will be shown.
 name: name of the model. Use for heading
 desc: description of model. Use for mouse over text.
 reftime: year of value
 year: year of value
 min:
 max:
 mean: 20 year mean (9 years before to 10 years after this year)
 minmean:
 maxmean:

Tide zone information

The Norwegian waters are covered by about 600 zones with different tide values.

URL: http://api.sehavniva.no/tideapi.php?tide_request=tidezones&lang=nn

lang (optional, default=nn): language for texts (see [Available languages](#))

Response example:

```
<tide>
  <meta licenseurl="http://kartverket.no/data/lisens/" />
  <tidezones>
    <zone id="522" delay="5" factor="1.09" changed="2017-02-09T11:15:24+01:00" usenn="NN2000">
      <levels refllevel="MSL" unit="m">
        <level code="1000YMAX" value="2.438" name="Høgvatn med 1000 års gjentakintervall" desc="
          Ekstremt høyvann som i gjennomsnitt forventes en gang per 1000 år." type="RETURN"/>
        <level code="500YMAX" value="2.394" name="Høgvatn med 500 års gjentakintervall" desc="
          Ekstremt høyvann som i gjennomsnitt forventes en gang per 500 år." type="RETURN"/>
        <level code="200YMAX" value="2.331" name="Høgvatn med 200 års gjentakintervall" desc="
          Ekstremt høyvann som i gjennomsnitt forventes en gang per 200 år." type="RETURN"/>
      </levels>
      <polygon>
        <point lat="68.424696" lon="15.124164"/>
        <point lat="68.418269" lon="15.126266"/>
        <point lat="68.415977" lon="15.140009"/>
        <point lat="68.421064" lon="15.144047"/>
      <wkt>
        POLYGON((15.124164 68.424696, 15.126266 68.418269, 15.140009 68.415977, 15.144047 68.421064, 15.124164 68.424696))
      </wkt>
    </polygon>
  </zone>
  ....
</tidezones>
</tide>
```

name: name of the station where predictions are calculated
code: code of this station
obsname: name of station where observed water levels are measured (if different from prediction station)
obscode: code of this station
delay: time delay (minutes) relative to the prediction station
factor: multiplication factor for tide levels from the prediction station
changed: time of last change of this zone
usenn: the height reference model used in this zone (NN2000 or NN1954)
reflevel: the reference level
code: level code
value: height value of this level
name: the name of this level
desc: description of this level
type: type of this level (RETURN level, ASTROnomical level, REference level)
point: latitude and longitude of points of the border of the zone
wkt: the border of the zone in "Well Known Text" format. See https://en.wikipedia.org/wiki/Well-known_text

Available languages

URL: http://api.sehavniva.no/tideapi.php?tide_request=languages

Response example:

```
<tide>
  <languages>
    <lang code="nb" name="Bokmål"/>
    <lang code="nn" name="Nynorsk"/>
    <lang code="en" name="English"/>
    <lang code="de" name="Deutsch"/>
    <lang code="nl" name="Nederlands"/>
    <lang code="se" name="Davvisámegiella"/>
  </languages>
</tide>
```

code: standard language two letter code (ISO 639-1). To be used in any request requiring a particular language in texts.

name: name of the language. May be used in selection menus.

Service info

Information about any unusual status of the tide system.

URL: http://api.sehavniva.no/tideapi.php?tide_request=service&lang=en

lang (optional, default=nn): language for text (english may be available. If not, norwegian text will be returned regardless of the value of the lang parameter)

Response example:

```
<tide>
  <service cominfo="The tide system will be unavaliable until 13:00"/>
</tide>
```

Error messages

Error messages will usually be similar to

```
<error>Invalid position</error>
```

If a file response is requested the error message may be in the file.

Available file formats

URL: http://api.sehavniva.no/tideapi.php?tide_request=fileformats&lang=nn

lang (optional, default=nn): language for text (see [Available languages](#))

Response example:

```
<tide>
  <fileformats type="tidedata">
    <file code="PDF" mime="application/pdf" name="Adobe PDF" descr="Adobe Portabelt DokumentFormat"/>
    <file code="XLS" mime="application/vnd.ms-excel" name="MS Excel" descr="Microsoft office excel (.xls)"/>
    <file code="NSKV" mime="text/plain" name="Afrodite" descr="Internt tekstformat for Kartverket"/>
  </fileformats>
  <fileformats type="levels">
    <file code="PDF" mime="application/pdf" name="Adobe PDF" descr="Adobe Portabelt DokumentFormat"/>
  </fileformats>
  <fileformats type="statistics">
    <file code="PDF" mime="application/pdf" name="Adobe PDF" descr="Adobe Portabelt DokumentFormat"/>
  </fileformats>
</tide>
```

type: data type for each format. Station levels (type="levels"), statistics (type="statistics"), water level data (type="tidedata"), land uplift (type="landlift") og ocean level change (type="searise") may be presented in different file formats

code: code to be used in the «file» parameter when requesting data

mime: mime type for the file type

name: name of the file type. To be used in selection menus

descr: description