Ellipsoidal height of datum in benchmarks

Hydrographic and Oceanographic Department
Japan Coast Guard

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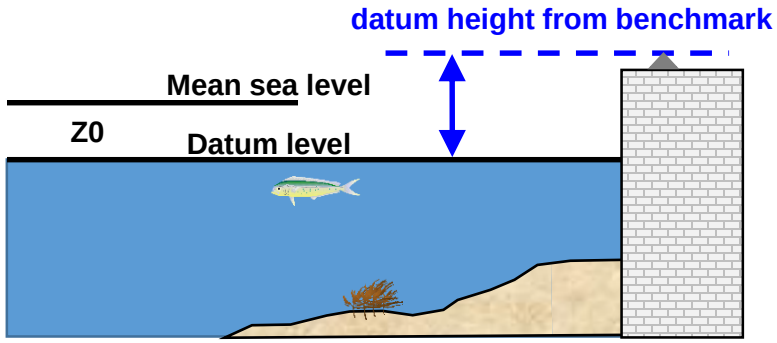
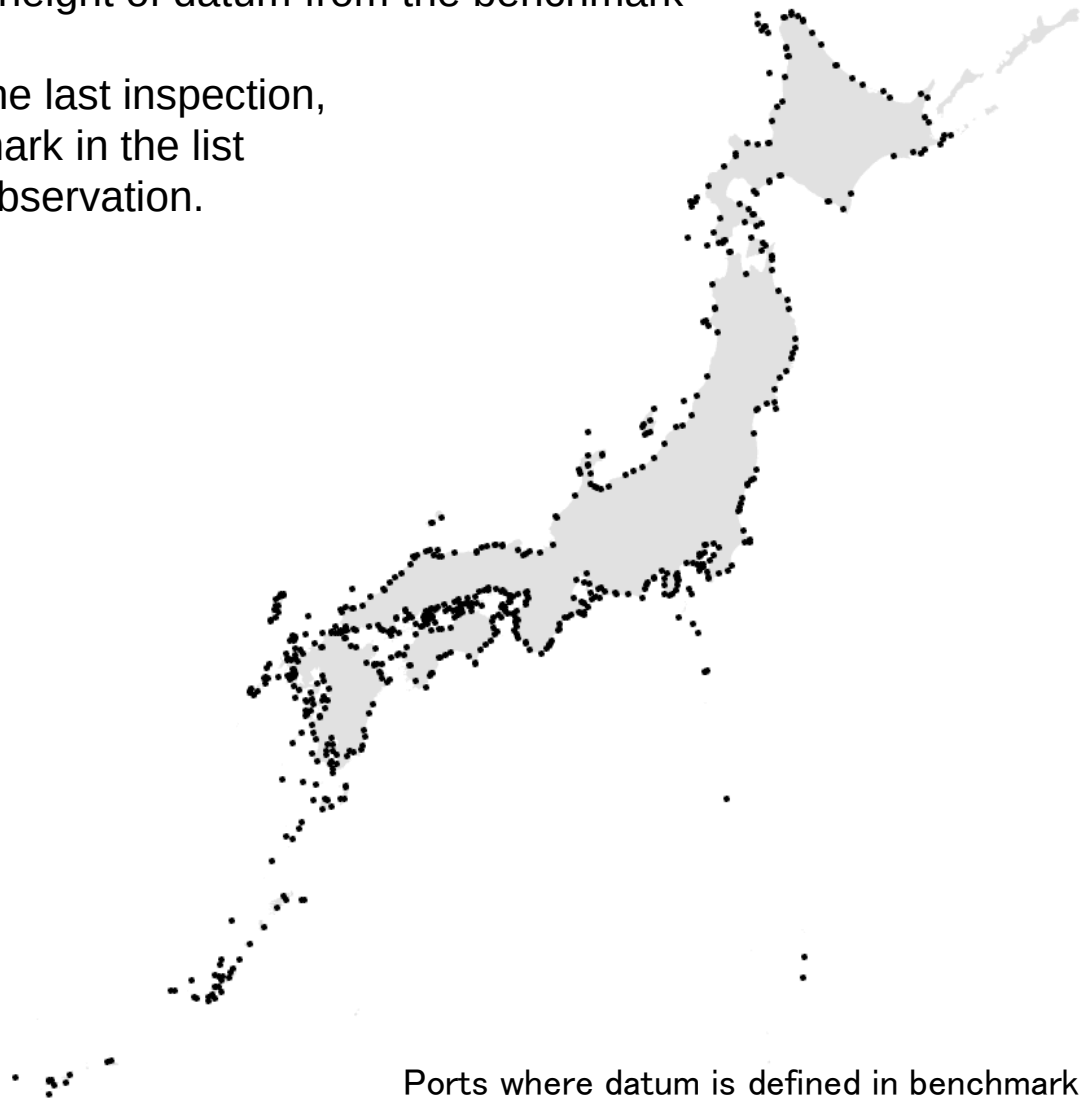
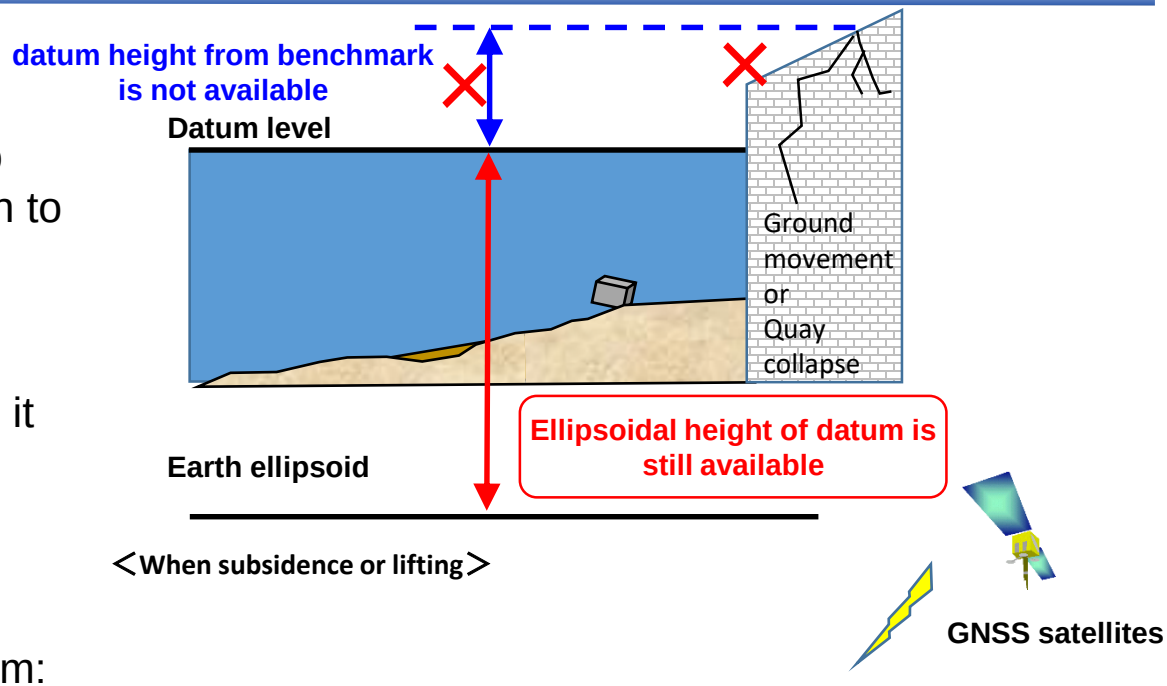
- The datum is defined as a height that is lower than the mean sea level by Z0 for each port.
- Japan Hydrographic and Oceanographic Department (JHOD) announces the datum level on the website as a list.
- For ports with managed benchmarks, the height of datum from the benchmark is also described in the list.
  - If it is surveyed within 3 years from the last inspection, the height of datum from the benchmark in the list can be used to survey without tidal observation.



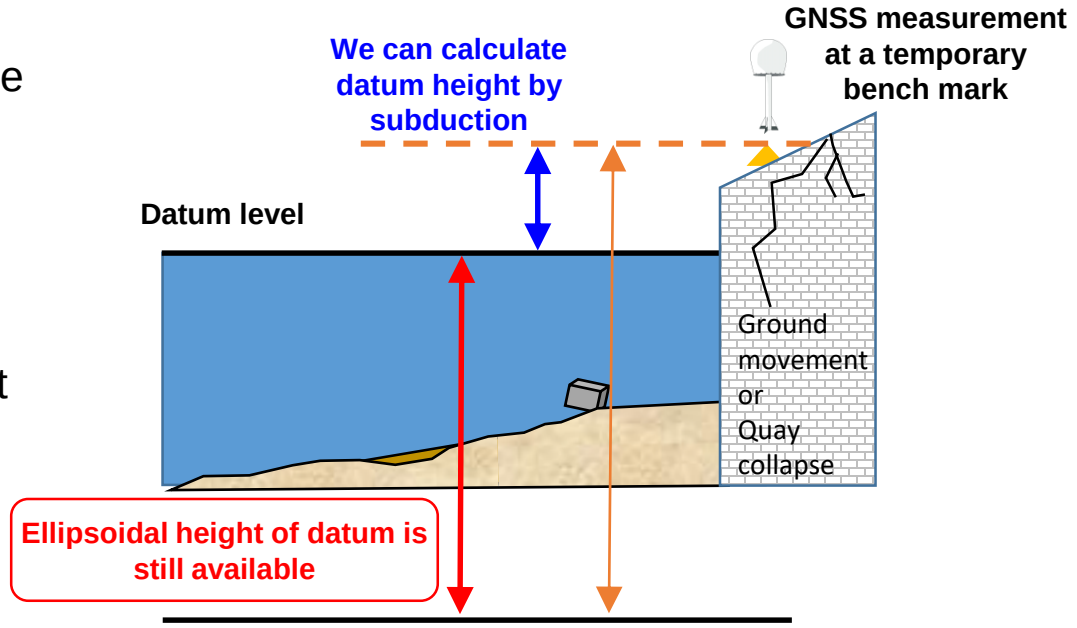


Ports where datum is defined in benchmark

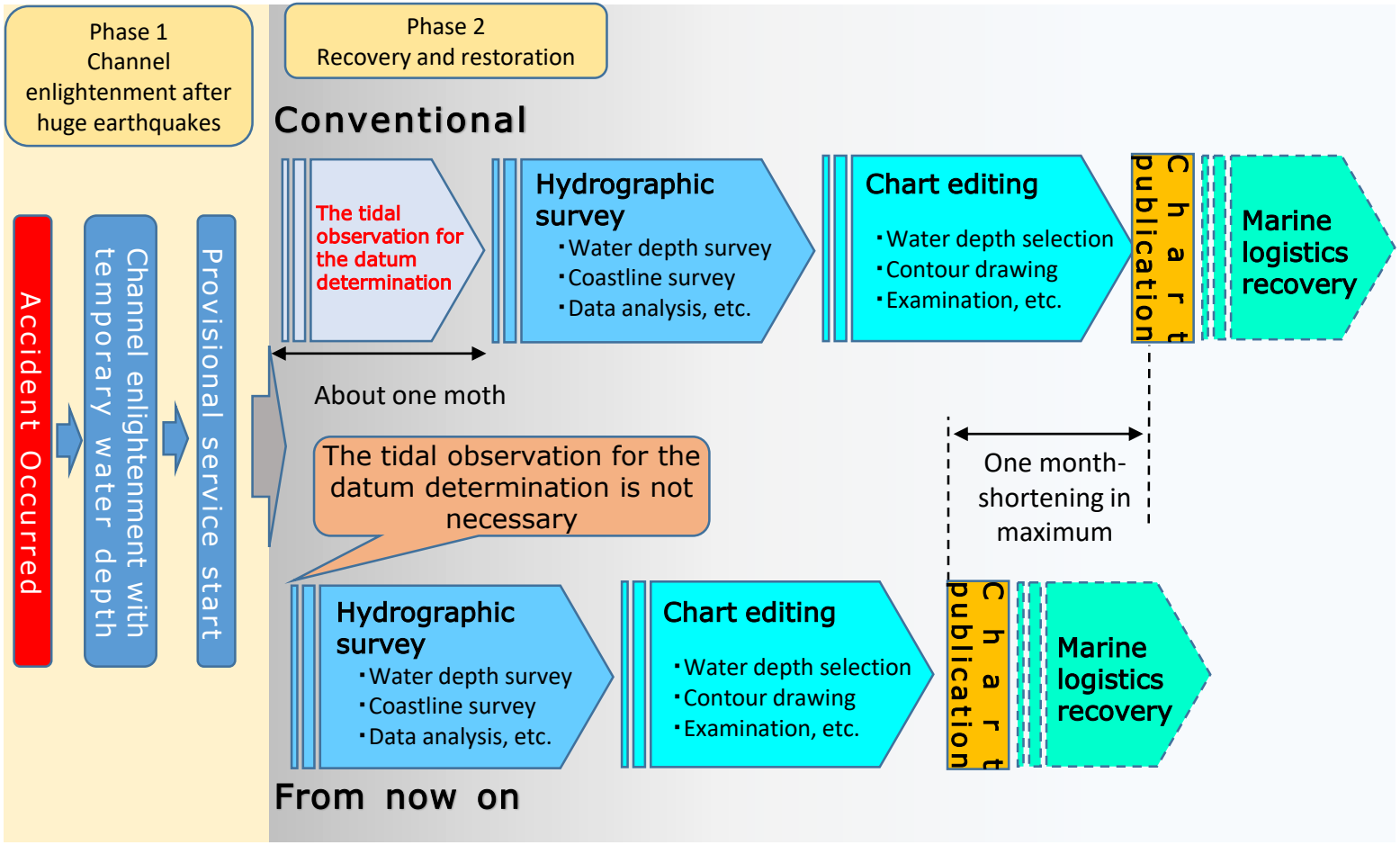
- In case of huge earthquakes
  - When benchmarks move or lost, in order to survey, it is necessary to do tidal observations at least one month to define the height of datum from the benchmark.
  - In the 2011 Tohoku earthquake, although it was promptly processed, it took six months to publish the chart



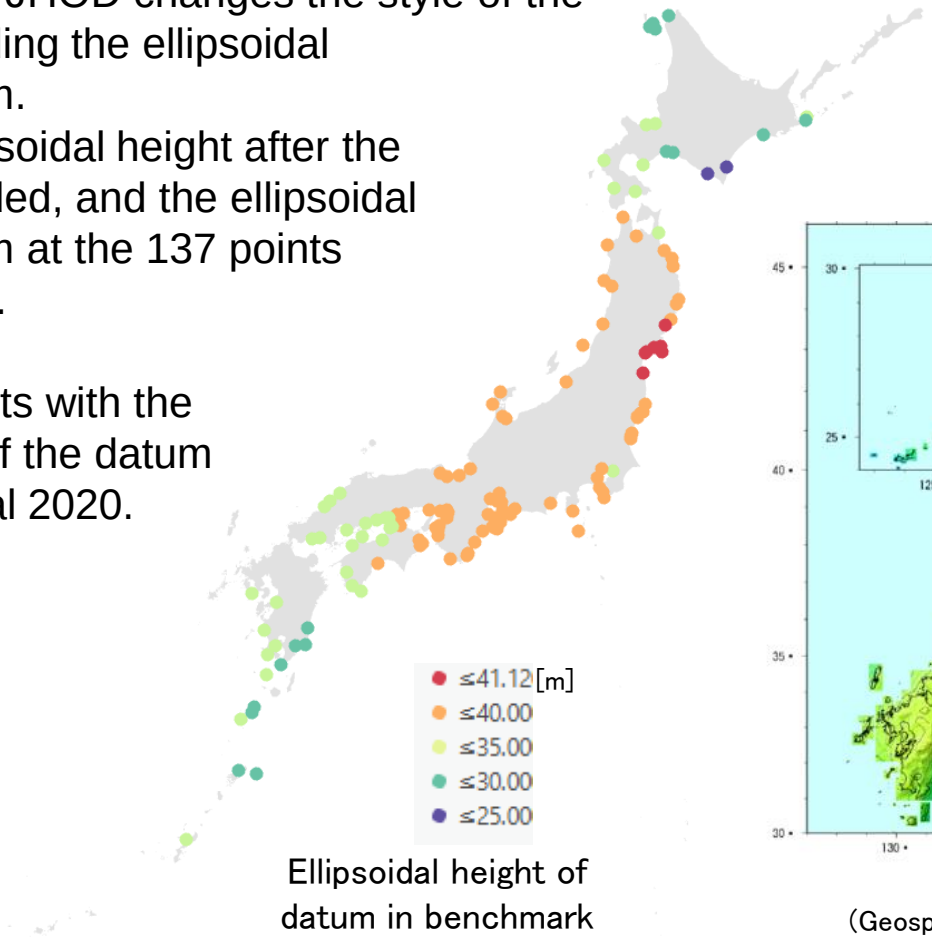
- If there is an ellipsoidal height of the datum:
  - In case of movement or breaking of benchmarks, we can promptly redefine the datum level.
    - Setting and measuring the ellipsoidal height of a temporary benchmark
    - Subducting the ellipsoidal height of datum by the ellipsoidal height of the temporary benchmark



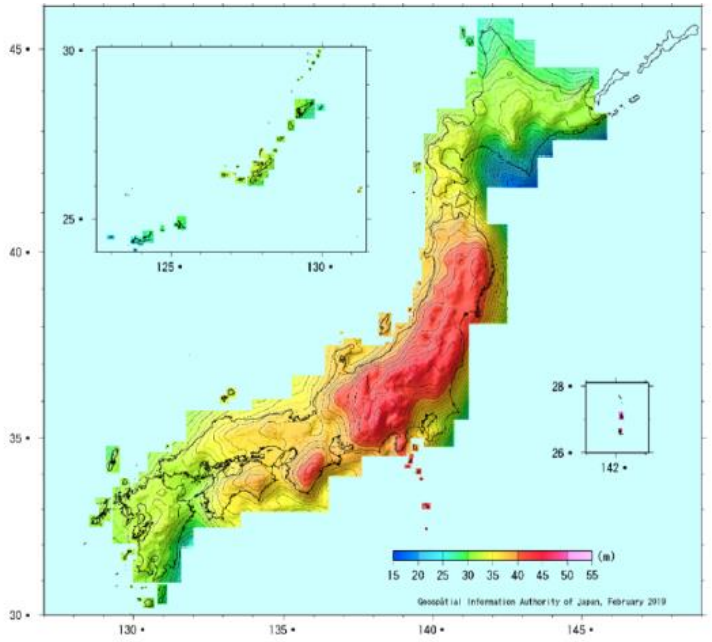
- Listing ellipsoidal height of datum
  -> Shortened time to publication of chart after earthquake disaster by skipping a monthly tidal observation



- In 8th March, JHOD released the ellipsoid height of the datum in relation to the benchmark.
- Timeline
  - GNSS observations of benchmarks start from 2016.
    - Baseline analysis between Geospatial Information Authority of Japan electronic reference point
  - Review the results and manage the ellipsoid height internally
  - In 8th March 2019, JHOD changes the style of the list of datum including the ellipsoidal height of the datum.
  - After that, the ellipsoidal height after the examination is added, and the ellipsoidal height of the datum at the 137 points is currently posted.
- from now on
  - The number of ports with the ellipsoidal height of the datum will be 240 by fiscal 2020.



Ellipsoidal height of datum in benchmark



Ellipsoidal height of geoid
(Geospatial Information Authority of Japan)