Active fault database of Japan: Gathering and spreading active fault data for earthquake risk management

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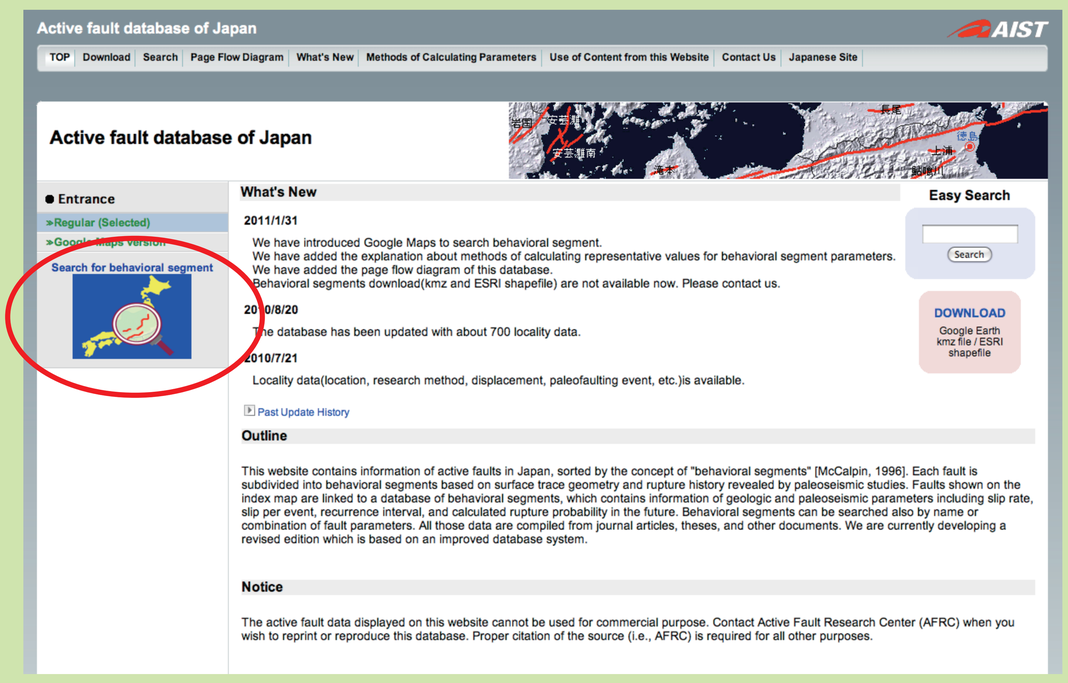
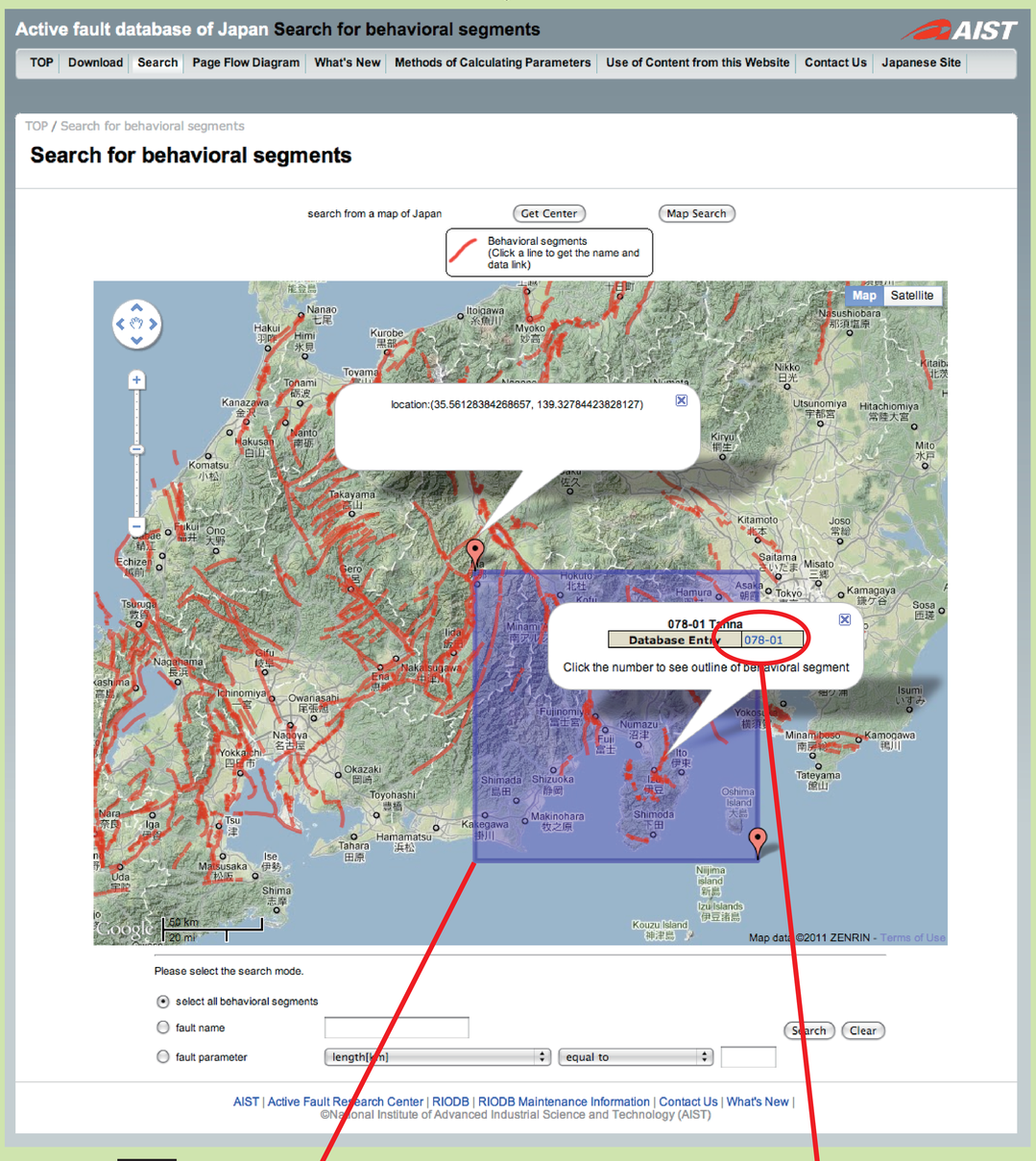
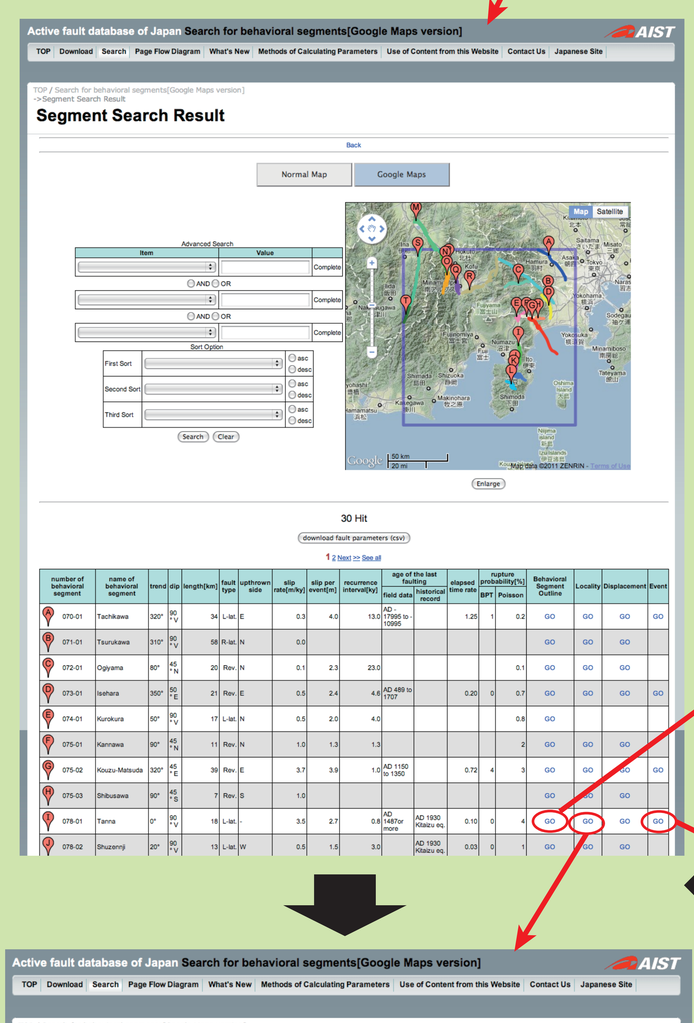
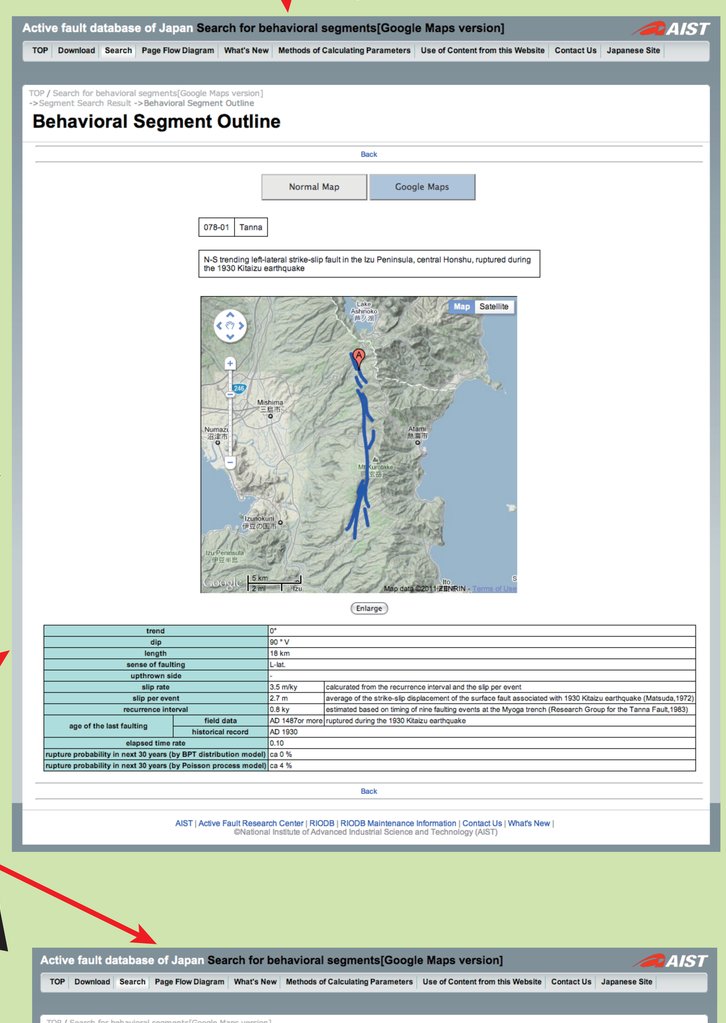
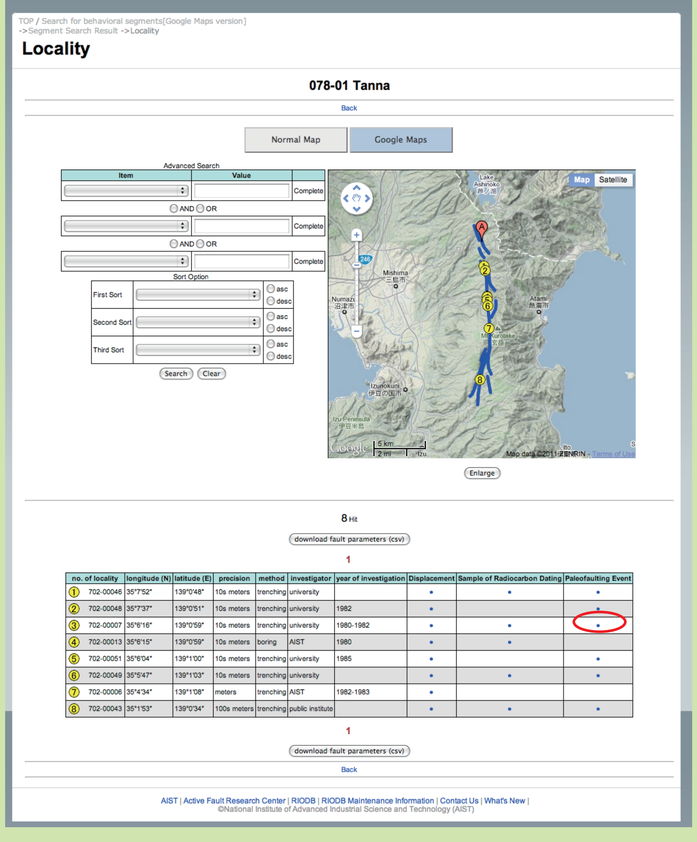
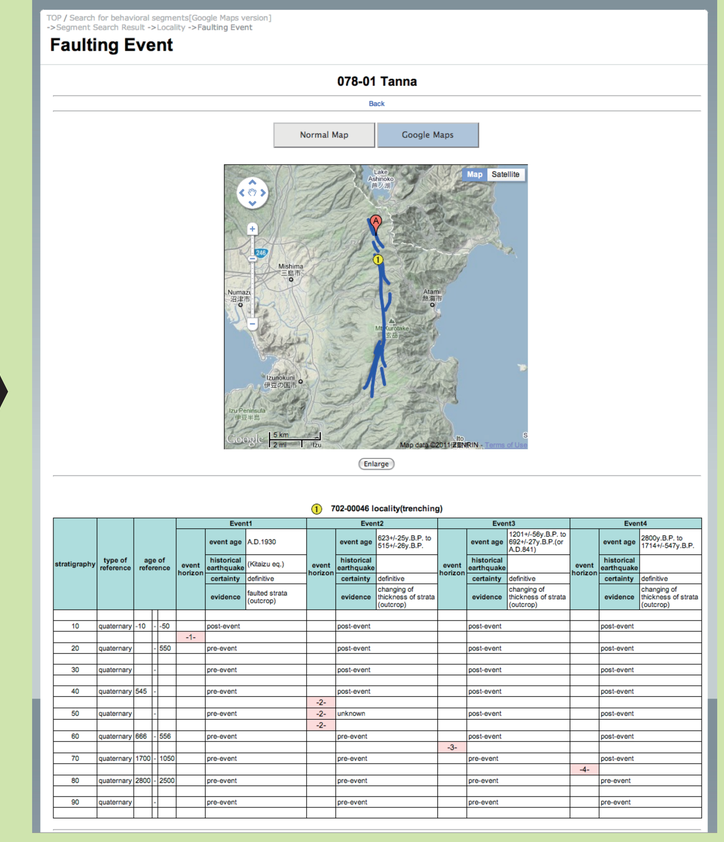












The Active Fault and Earthquake Research Center, GSJ/AIST was constructed an active fault database and opened to the public on the internet from 2005 to make a probabilistic evaluation of the future faulting event and earthquake occurrence on major active faults in Japan. The database consists of three sub-database, 1) sub-database on individual site, which includes long-term slip data and paleoseismicity data with error range and reliability, 2) sub-database on details of paleoseismicity, which includes the excavated geological units and faulting event horizons with age-control, 3) sub-database on characteristics of behavioral segments, which includes the fault-length, long-term slip-rate, recurrence intervals, most-recent-event, slip per event and best-estimate of cascade earthquake. Major seismogenic faults, those are approximately the best-estimate segments of cascade earthquake, each has a length of 20 km or longer and slip-rate of 0.1m/ky or larger and is composed from about two behavioral segments in average, are included in the database.

This database contains information of active faults in Japan, sorted by the concept of "behavioral segments" (McCalpin, 1996). Each fault is subdivided into 550 behavioral segments based on surface trace geometry and rupture history revealed by paleoseismic studies. Behavioral segments can be searched on the Google Maps. You can select one behavioral segment directly or search segments in a rectangle area on the map. The result of search is shown on a fixed map or the Google Maps with information of geologic and paleoseismic parameters including slip rate, slip per event, recurrence interval, and calculated rupture probability in the future. Behavioral segments can be searched also by name or combination of fault parameters. All those data are compiled from journal articles, theses, and other documents. We are currently developing a revised edition which is based on an improved database system.

More than ten thousands locality data such as the longitude and latitude, research method, displacement, age of paleofaulting etc. of each surveying sites are also available on the database. These data can be shown from the result view of the segment search.

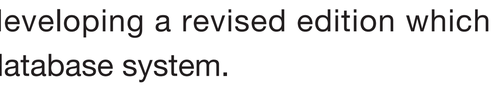
The URL of the database is as follows:
http://riodb02.ibase.aist.go.jp/activefault/index_e.html

References
McCalpin, J. P., 1996. Application of paleoseismic data to seismic hazard assessment and neotectonic research. McCalpin ed. "Paleoseismology", Academic Press, 439-493.

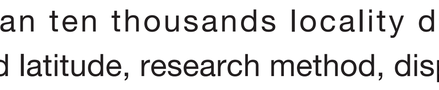
Criteria of segmentation

- Geometry of fault trace

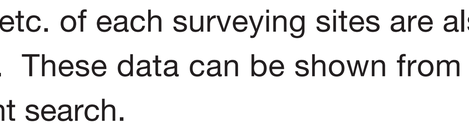
1. Gap of more than 2 kirometers



2. Bend of more than 20 degree



3. Stepover



4. Parallel faults separated in more than 2 km

- Fault behavior
  Change of slip rate or slip direction

- Paleoseismicity
  Defference of faulting history (timing of past faulting)

- Scaling Law
  One segment longer than 20,000 times of D shoud be divided into two.

Method for estimation of parameters

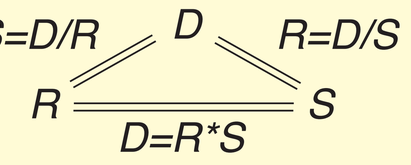
Long term slip rate *(S)*
Recurrence interval *(R)*
Slip per event *(D)*

- Adopt an average or a mid range value in case that the original field data have dispersion or uncertaionty

- Estimate *S* based on a qualitative assesment of its geomorphic expression

- Calculate *D* based on empirical relationship between *D* and *L*

- One parameter can be calcurated from other two parameters.



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