

Tsunami heights of historical tsunamis based on the "Japan Tsunami Trace database" and other tsunami trace data along the Pacific Coast of Iwate Prefecture

*Keita Takada¹, Hidenori Shibata², Atsushi Odashima², Kentaro Imai³, Yuichi Ebina⁴, Kazuhisa Goto⁴, Shin Koshiya⁵, Hidekazu Yamamoto⁵, Masanobu Shishikura⁶, Atsuo Igarashi¹, Toshihiko Ichihara¹, Hirohisa Kinoshita¹, Tetsuya Ikeda¹

1.Fukken Co.,Ltd., 2.River Division,Department of prefectural Land Development,Iwate Pref Govt, 3.JAMSTEC, 4.IRIDEs Tohoku University, 5.Faculty of Engineering, Iwate University, 6.Institute of Earthquake and Volcano Geology, AIST

Iwate Prefecture is advancing examination for future tsunami hazard based on scientific knowledge such as historical records and tsunami deposits. We referred to the "Japan Tsunami Trace database" and previous studies about tsunami heights and arranged them to compare with each other. First, we arranged tsunami heights of five major tsunamis which occurred after the modern times (2011 Tohoku-oki, 1896 Meiji Sanriku, 1933 Showa Sanriku, 1968 Tokachi-oki, 1960 Chile). Then we compared these major tsunamis with historical tsunamis that recorded damages along the Iwate coast. According to comparison between major tsunamis, 2011 Tohoku-oki is highest in most part of the coast of Iwate Prefecture. However, 1896 Meiji Sanriku is almost the same as 2011 Tohoku-oki along the northern coast, and higher than 2011 Tohoku-oki at several sites.

1896 Meiji Sanriku and 1933 Showa Sanriku recorded large tsunami at the Yoshihama Bay, the Ryori Bay and the Hirota Point. These records might mean exaggeration or suggest conditions that amplified tsunami.

Although tsunami heights that documented in the "Yamana Reports" is almost matching with other records, unusual heights are shown at several sites. These records might include exaggeration based on folklore.

1968 Tokachi-oki and 1960 Chile tsunami are almost lower than 5m throughout the coast of Iwate Prefecture. These tsunamis show a trend which heights are a little higher at inside than the mouth of the bay.

1611 Keicho Oushu (Sanriku) tsunami recorded large tsunami at the Tanohata, Iwaizumi, Taro Coast and the Funakoshi, Yoshihama, Okirai Bay. Because large tsunami was recorded along southern coast of Iwate, the trend of tsunami heights distribution is similar to 2011 Tohoku-oki.

Although there are no records of definite damage by 869 Jogan tsunami in ancient documents along the Iwate coast, the distribution of tsunami deposits suggest that this tsunami might be large as 2011 Tohoku-oki.

Tsunami heights of 1856 Ansei, 1763 Hohreki, 1677 Enpoh tsunami which source located in northern part of Japan Trench show similar trend to 1968 Tokachi-oki. The effect of these tsunamis seems small along the Iwate coast. However, Tsunami height might be over 10m high on the coastal condition because 1677 Enpoh tsunami recorded 13m at Settai site. 1793 Kansei tsunami is also small relatively along the Iwate coast except for 9m at Ryoishi site.

Keywords: tsunami height, "Japan Tsunami Trace database", historical tsunami, Jogan tsunami, Jogan tsunami, Keicho Oushu (Sanriku) tsunami, Iwate Prefecture