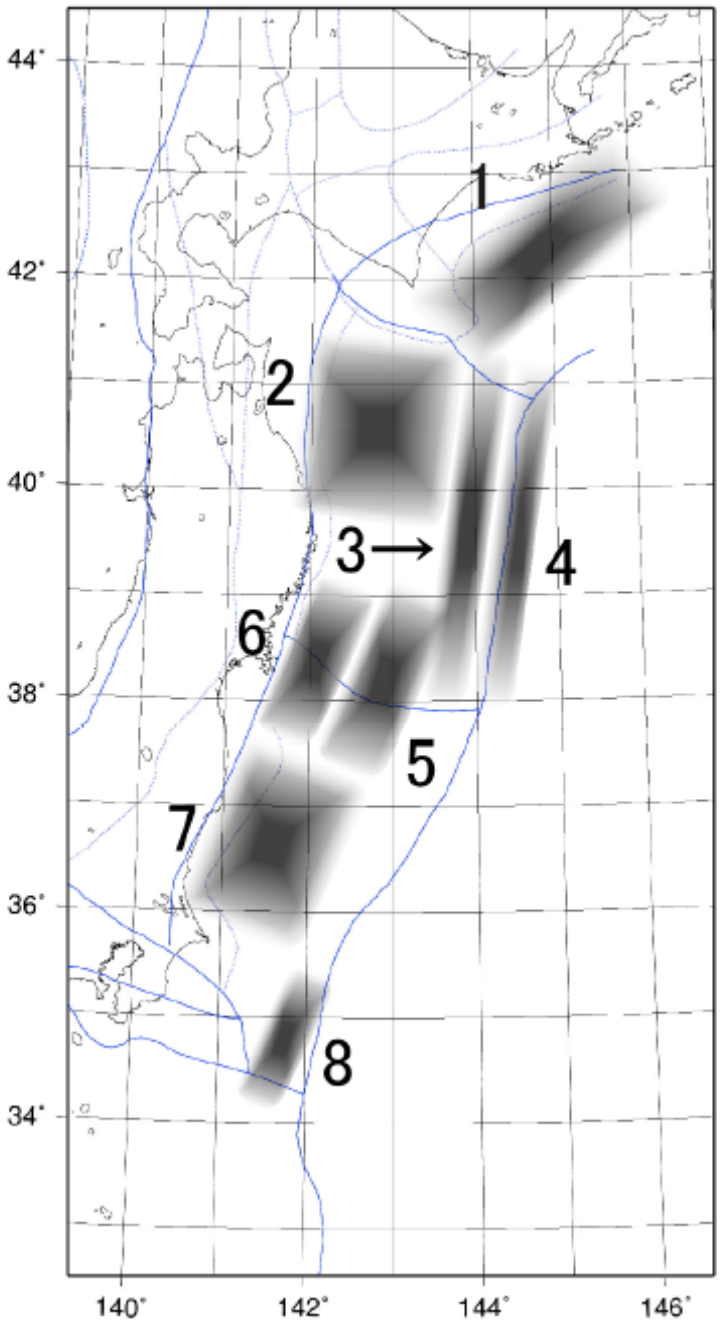
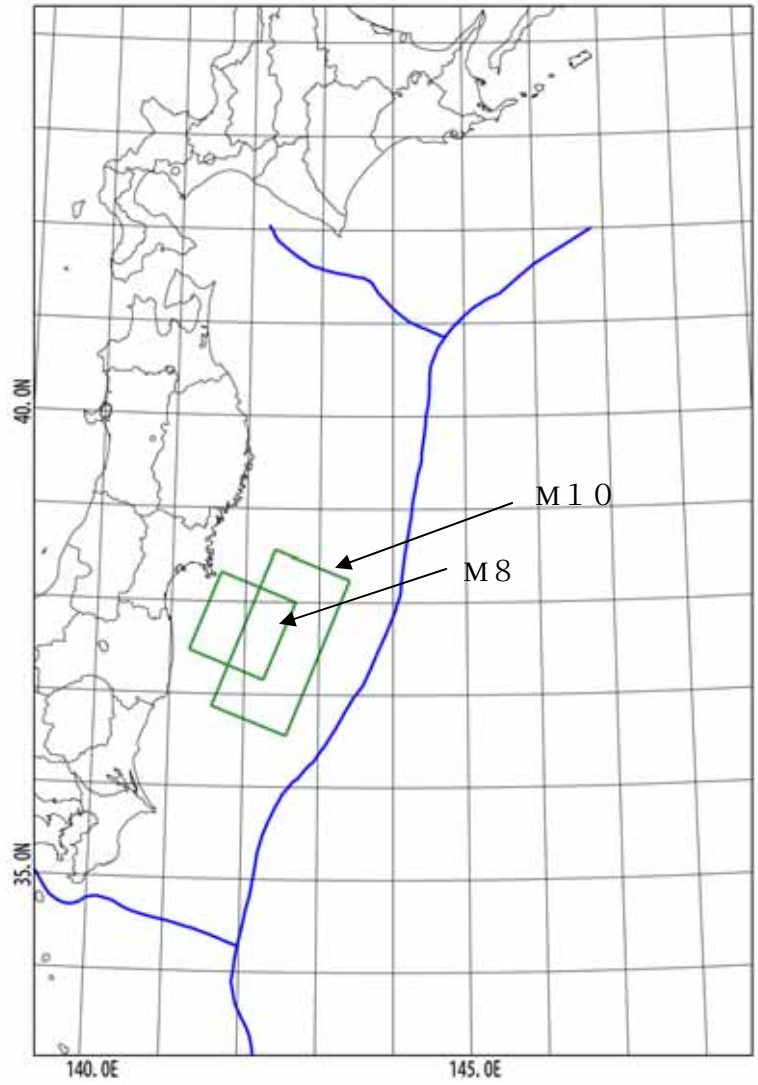
Background concerning the Evaluation of Safety of Wave Sources

	Background	Our Responses
	1F S41-47 Application to and approval of establishment based on the Chile Tsunami (water level 3.122m)	
H14.2	Japan Society of Civil Engineers published “Tsunami evaluation technology for nuclear power stations” (hereafter referred as “Tsunami evaluation technology”)	Implemented safety evaluation based on “Tsunami evaluation technology” Took countermeasures such as raising pumps, makings procedures and watertightening buildings, etc. (water level) O.P.＋5.4m-5.7m
H14.7	Headquarters for Earthquake Research Promotion released long-term evaluation (hereinafter referred to as “Contention of Headquarters)” →Japan Society of Civil Engineers considered it, adopting probabilistic evaluation method which was supposed to consider in H15 (2003). (Japan Trench line of Fukushima Prefecture-Oki is an area in which no tsunami had happened before and therefore there was no wave sources model)	
H15 -H17 H18.7	Japan Society of Civil Engineers considered the probabilistic evaluation method ⇩ Japan Society of Civil Engineers summarized and published a dissertation with regard to the result of consideration of probabilistic evaluation method from H15 to H17 *Afterward, Japan Society of Civil Engineers has been considering the probabilistic evaluation method.	Paying attention to Japan Society of Civil Engineers’ consideration and considered the probabilistic method as well ⇩ Implemented a trial analysis with probabilistic evaluation method at the stage of development, as an achievement of consideration from H15 to H17 and released an dissertation in the 14th International Conference on Nuclear Engineering (ICONE－14).
H18.9 H19.7 H20.3	Revision of Regulatory Guide for Reviewing Seismic Design (clear description on the safety concerning tsunami caused by earthquakes was added) Instruction of earthquake resistance back check Chuetsu-Oki Earthquake in Nigata Prefecture occurred -Countermeasures were taken based on the earthquake	Started earthquake resistance back-check ⇩ Submitted an interim report of earthquake resistance interim report (Tsunami would be evaluated in the final report)
H20.4 -10 H20.12	Received a draft dissertation with regard to Jogan Tsunami from Mr. Satake	Preliminary calculation was conducted for the “Contention of Headquarters” <u>Required revision of consideration of wave source models, etc. and tsunami evaluation technology to Japan Society of Civil Engineers</u> Under Consideration Conducted preliminary calculation concerning Jogan Tsunami
H21.2 H21.8-9	Explained Jogan Ttsunami to NISA	Implemented safety evaluation and took necessary countermeasures based on “Tsunami evaluation technology”, considering the data of latest ocean floor topography and tidal level for the

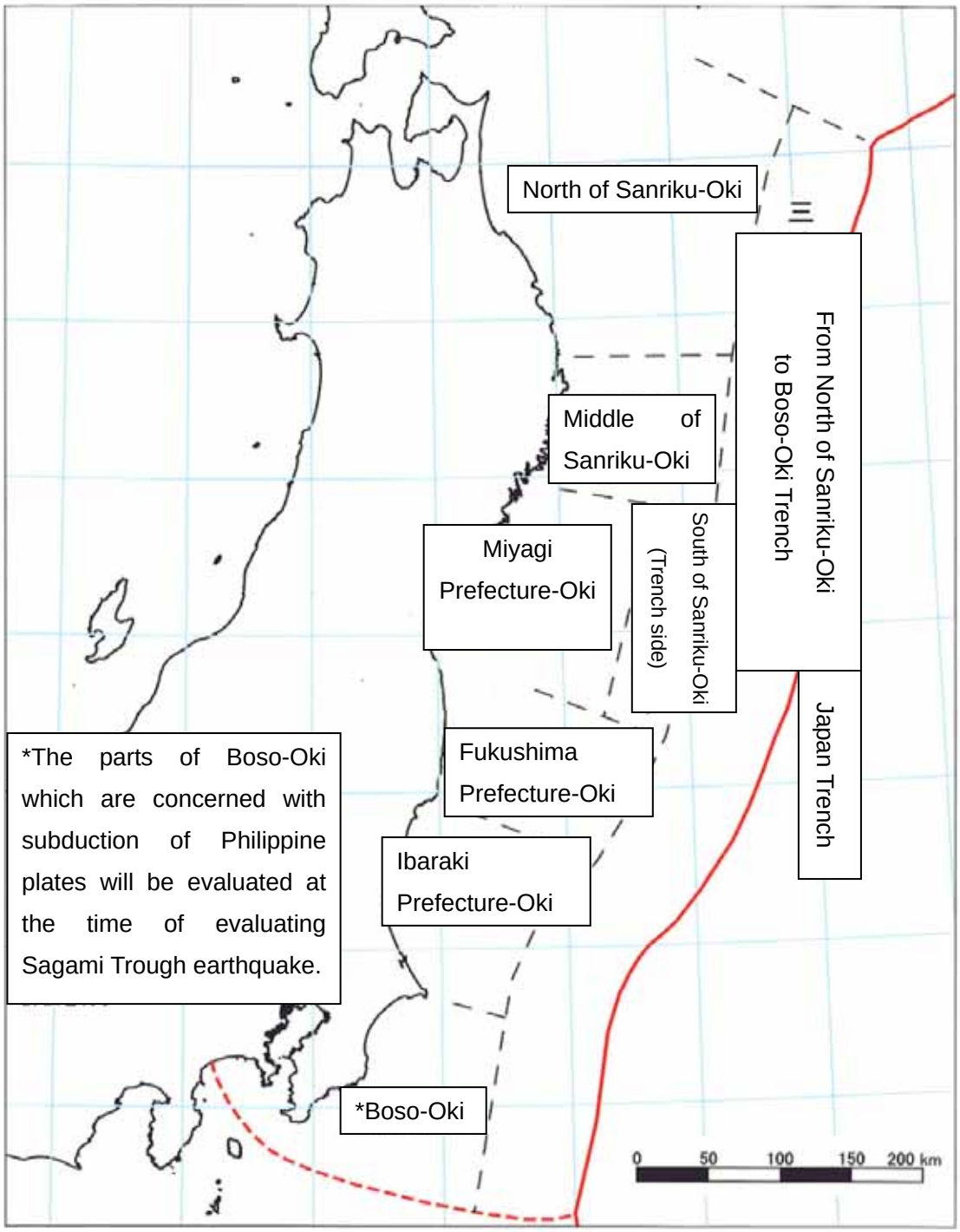
			submission of the final report concerning back-check (water level) O.P.＋5.4-6.1m
H21.4 H21.6 H21.7 H21.11 H22.3	Mr. Satake of National Institute of Advanced Industrial Science and Technology released a dissertation concerning Jogan Tsunami (the conclusion is that fixing wave source models requires additional surveys) In a joint WG, some indication of Jogan Earthquake was made toward our interim report of back-check. Evaluation of NISA on the interim report of back-check (“Appropriate responses based on the result and achievement of investigation of Jogan Tsuami”)	Under Consideration	Required consideration concerning Jogan Tsunami to Japan Society of Civil Engineers same as the Contention of Headquarters Tsunami sediment survey (commenced) Tsunami sediment survey (ended)
H23.1 H23.3	 Explained to NISA		Contributed a dissertation about the result of tsunami sediment survey (*) to Japan Geoscience Union. * No sediment that stems from Jogan Tsunami was found in the south of Fukushima Prefecture



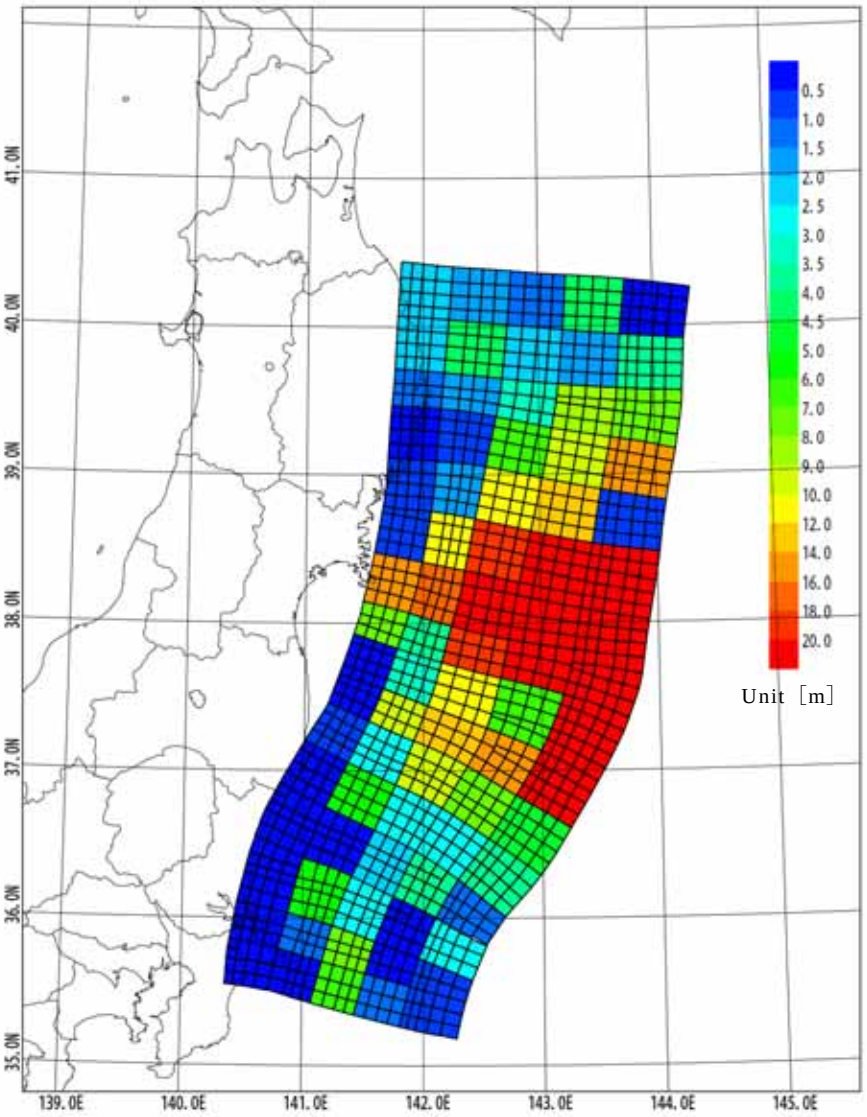
Wave sources by Japan Society of Civil Engineers (2002)



Wave Sources of Jogan Tsunami by Mr. Satake and others (2008)



Areas for Evaluation from the North of Sanriku-Oki to Boso-Oki
(From HP of Headquarters for Earthquake Research Promotion, Earthquake Research Committee, on July 31, 2002)



Wave Source Assumed Based on an Inversion Analysis
(Tokyo Electric Power Company, 2011)