Introduction
Ocean warming and climate change will be the possible factors which can impact on food contamination and foodborne diseases. And the comprehensive strategies are required in consideration of changes in the nature and occurrence of food safety hazards which are being provoked by climate change and its variability. Long term data from the sanitary survey and monitoring for biological and toxicological hazardous elements in seafood and its surrounding marine environment for several decades were analysed to evaluate the effect of climatic factors on various food safety risks to suggest their counter measures and supplementary element for the national level safety control strategy in Korea.

Predominant changes around Korean Peninsula

Average surface water temperature around Korean Peninsula was increased by 1.2°C for 45 years (Fig. 1). Current flow and distribution of food organisms were likely to be affected. A cuttle fish was caught at the south coast of Korea but catchable area has been expanded into the north-east areas since the end of 1990’s (Fig. 2).

Pathogenic vibrios and marine environmental factors

Several environmental factors (temperature of seawater, salinity, pH) were measured (Fig. 4). And screening of Vibrio spp. was performed by PCR to detect species-specific genes (rflp and vvhA). Three years (2013-2015) of data were analyzed by linear regression to calculate the coefficient of determination. The prevalent of V. vulnificus and V. parahaemolyticus and their relationship with marine environmental factors were investigated at 11 urban esturian areas. Seawaters (2000 samples) were collected from three points of each area and four environmental factors (temperature of seawater and atmospheric, salinity and pH) were measured (Fig. 4). A study on Paralytic Shellfish Poison of Sea Mussel, Mytilus edulis -Food Poisoning Accident in Gamchun Bay, Pusan, Korea, 1988-. Korean J Fish Aqu Sc 20, 293-299. Jaykus et al., 2008. Climate change: Implications for food safety. Clarke R and Friel M, eds. FAO, Rome, Italy, 39-43. NIFS, 2012. FY 2012 Annual Report of National Institute of Fisheries Science. Pusan, Korea. NIFS, 2014. FY 2014 Annual Report of National Institute of Fisheries Science. Pusan, Korea.

Though relatively little work has been done to characterize the specific link but it is generally accepted that frequency, intensity and duration of harmful algal blooms and relevant shellfish toxins occurrence are increasing in aquatic environments on a global scale. Some of this may be caused by changes in climate. In Korea the period of PSP toxins occurrence extended from 15 weeks to 31 weeks in the south coast and the affected area has also expanded into the whole coastal areas since 2000 (Chang et al., 1986). The levels of PSP toxins also showed trend of increase and extremely high toxin level (20357 µg/100g) was recorded in 2010 (regulatory limit ≤ 80 µg/100g). This trend of toxins level increase can not be statistically validated because harmful algae species which cause PSP toxins accumulation in shellfish comprise only a small component of the phytoplankton community. And responses of harmful algae species to climate change may differ from those of the whole phytoplankton community.

Conclusions
It is prudent of us to say that climate change has implications for food safety. From a marine microbiological perspective, climate change and various factors exacerbate eutrophication causing harmful algal growth. Accumulation of toxins produce by the algae by filter feeders such as vibrios leading to an increased risk relevant to raw consumption of various seafood. For better understanding and controlling emerging these hazards at all stages of the seafood chain, efforts are required in a number of essential areas such as mathematical modeling, development and application of scientific tool boxes to characterize interactions in microbial communities, systematic surveillance and monitoring for foodborne pathogens, and also reenforced coordination is compulsory among food safety, public health and environmental authorities. Human and environmental health is inter-dependent and inter-related. Reenforced communication and cooperation among professionals in the world would be significantly valuable for correct evaluation of the impact of global climate change on seafood safety and human and environmental health. As the FAO indicated we need “One Health” concept (Jaykus et al., 2008).