

## **Nitrification rates in the Subarctic and Subtropical North Pacific**

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Nitrification, ammonia to nitrite and nitrate, by microorganisms is ubiquitous in the ocean and plays an important role as a producer of nutrients for primary producers, a primary producer in deep sea by fixation of CO<sub>2</sub>, and a producer of N<sub>2</sub>O which is one of the greenhouse gases. Recently, it has been reported that ammonia-oxidizing archaea has a potential activity to use urea as a substrate of nitrification. It is important to reveal how much nitrification rates using both ammonia and urea are in the ocean.

We conducted on-board incubation experiments during a cruise MR14-04 of R/V Mirai. Water samples were collected from Niskin samplers into glass vials directly without air. Vials were stored at in-situ water temperature after addition of <sup>15</sup>NH<sub>4</sub><sup>+</sup> or <sup>15</sup>Urea. After 12 to 30 hrs incubation, samples were filtrated by 0.45µm filters and stored at -20°C until analysis. We measured excesses of <sup>15</sup>N in NO<sub>x</sub> and only nitrate in the filtrated samples and the samples after nitrite removal with sulfamic acid. And then, nitrification rates, both ammonia or urea to nitrite and nitrate, were calculated. Our results indicated that both ammonium and urea could be a source for nitrification in the open ocean. We will present profiles of nitrification rates from ammonia and urea as a substrate along 47°N and 149°E in North Pacific.