Regeneration of Anticyclone: From Warm To Cold

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1. Prologue: Kuroshio Warm-Core Rings

- Origin in the Kuroshio Extension
- Long life time (> 1 yr)
- Poleward propagation into the western subarctic gyre
- Insufficient information for disappearance processes within the subarctic gyre

Fig. 1. A true color image of the northwestern Pacific off Japan from MODIS Aqua

Objective

To examine the fate of the mature rings in the subarctic gyre

2. Profiling float observation

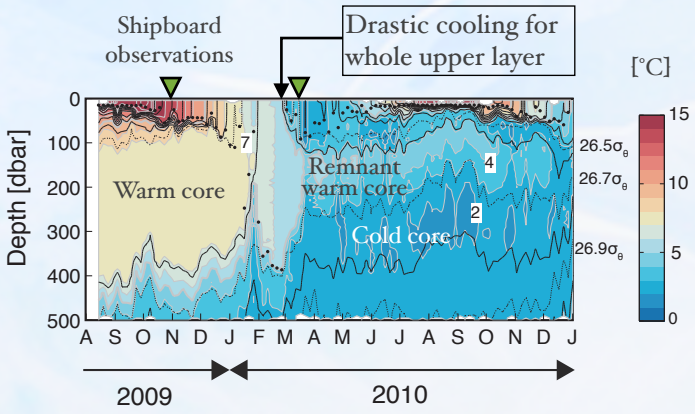

Fig. 2. Time series of potential temperature (color shades with gray contours) and potential density (black contours) as measured by a profiling float within a ring

3. Shipboard observation

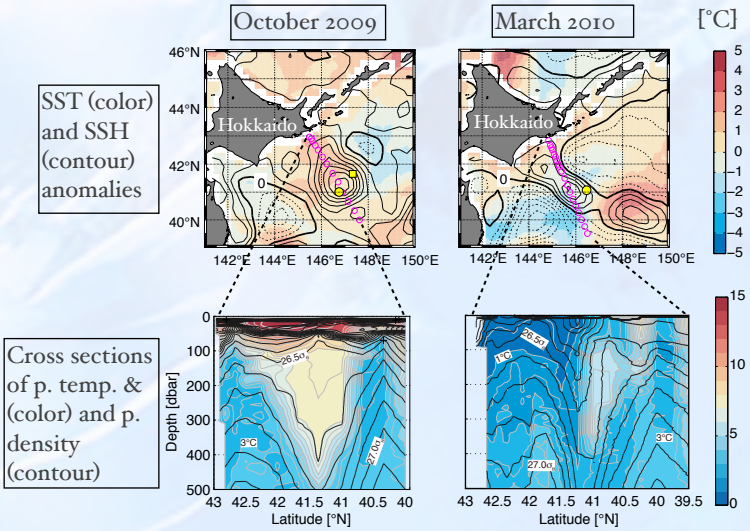

Fig. 3. Shipboard observation stations (upper) and potential temperature/density profiles (lower)

4. Conclusion

A warm anticyclone was regenerated to become a cold anticyclone.

(kept being an anticyclone despite the intrusion of the cold and fresh water into its core)

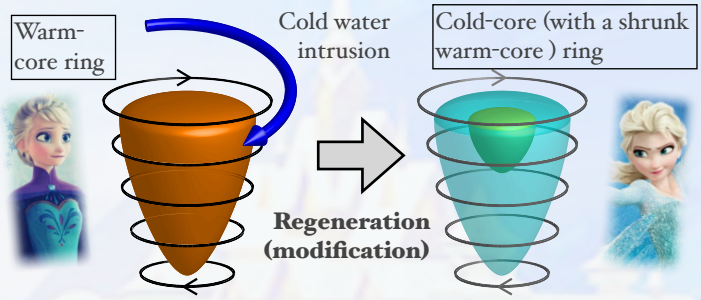

Fig. 4. Schematic diagram of the regeneration of the ring

Epilogue

The regenerated ring propagated southward and was absorbed to another warm-core ring. This life cycle of rings may enhance inter-gyre exchanges in heat and material in the western North Pacific

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Full Title:
Regeneration of a warm anticyclonic ring by cold water masses within the western subarctic gyre of the North Pacific