Preface

The UJNR (The U.S.-Japan Cooperative Program in Natural Resources) Aquaculture Panel was established in 1968, and the business meeting and symposium have been held every year since 1971. Through the long history of UJNR, Aquaculture Panel has contributed to the development of aquaculture researches of both countries by means of various cooperative activities, such as the exchange of scientists and literatures, and the promotion of joint research projects. The Aquaculture Panel is highly appraised as one of the most active UJNR panels in both countries.

The 47th business meeting of the UJNR Aquaculture Panel was conducted at Okinawa Industry Support Center, Okinawa prefecture, Japan on November 12, 2019, and the scientific symposium was held at the same venue from November 12 to 13. The symposium theme was "Marine aquaculture in a changing environment" which was the 10th three-year plan commenced in 2017. As the final year of the three-year plan, we discussed about application of aquaculture technology to provide sustainable seafood and reduce impacts of environmental change. Seventeen oral presentations were made on topics such as new techniques to assess and mitigate impacts of environmental changes on aquaculture, impact assessment of environmental changes and conservation of fisheries environment in coral reef areas, production management under environmental changes in bivalve aquaculture, and aquaculture technologies to respond to environmental changes in seaweed breeding and feed development. The proceedings of the 47th UJNR Aquaculture Panel scientific symposium "Marine aquaculture in a changing environment" is published as the special issue of the Bulletin of Japan Fisheries Research and Education Agency. With great pleasure, this UJNR proceedings containing high quality papers authored by selected American and Japanese aquaculture scientists will hopefully help improve the aquaculture environment programs, which is expected to contribute to the development of the aquaculture industry in both the United States and Japan.

Finally, I would like to express my sincere gratitude to the colleagues involved in the UJNR Aquaculture Panel for their efforts in the preparation and organization of the symposium. I would also like to deeply thank the editorial board members for publishing the proceedings.

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