2-A. *What are the institute’s most recent scientific achievements and accomplishments?*

The FY 2003 Annual Report (Appendix D) is included in this briefing binder. Sixty-five individual projects are summarized. (Appendix E provides a complete listing of all projects contained within the current cooperative agreement.) A few highlights are:

1. Description of the relationship of long-term sea level fluctuations at Honolulu to Pacific North America (PNA)-related fluctuations in winds and sea level pressure.

2. Identification of statistically significant relationships among climate variables and public health parameters (incidence of dengue fever, influenza and fish poisoning) in the South Pacific (Fiji).

3. Completion of the first comprehensive analysis of a significant Hawaiian heavy rain event in which the WSR-88D capabilities are applied.

4. Identification of a statistical distribution function (lognormal) for atmospheric columnar water vapor content based upon GPS-derived measurements.

5. A sequence of papers based upon a novel paradigm proposed to describe the formation of both the Pacific cold-tongue climate state and ENSO in a unified coupled dynamic framework.

6. Documentation of a decline in Monk Seal populations in the Northwest Hawaiian Islands, possibly in response to ocean variability.

7. Progress in understanding the response of sea turtles to various bait types. This is an important aspect of understanding and adapting longline fishing strategies.
8. Development and application of Multifan-Cl (PFRP), state-of-the-art fisheries management software that raises the standard for this kind of work everywhere.

9. Tuna tagging and trophic pathway analyses in Hawaii. Documentation of utilization of inshore and offshore habitats by bigeye and yellowfin tuna, relative contributions of fishing and emigration to population turnover, differences in feeding habits between species and between aggregation types, and confirmation of trophic level shift by age.

10. Application of the Kalman filter model to electronic tracking results has enabled researchers to generate plausible tracks from archival and pop-up tags for use in documenting post-hooking mortality of longline bycatch species.

11. Comprehensive analysis of the role of oceanography in mediating vulnerability of tunas to the longline fleet and development of fresh insight into seasonal and inter-annual variability of longline catches.

12. Instrumentation of inshore Fish Aggregation Devices (FADs) with devices to monitor occupations by individual tunas demonstrates short- and long-term occupations and possible associations between individual fish.