NEAEB World Café Summary – NEAEB 2007 – Moderator: Shane Bradt

Table 2 – What are the real possibilities for the increased use of remote sensing to manage aquatic ecosystems?

Round 1

Elisha Allen
Kathie Dello
Sarah Wheeler
Becky Weidman

Round 2

Sue Flint
John Nagle
Jeff Barrett
Ric Bertrand

Round 3

Maria Aliberti
Krystal Kliger

Each of the three groups was composed of very different people expressing diverse interests in remote sensing of aquatic systems. Although wetlands were deemed to be an important aquatic resource, most of our conversations centered on the use of remote sensing to monitor surface water due to the fact that techniques for wetlands rely on land-based rather than water-based analytical techniques. In general, our discussions focused primarily on the use of visible and near infrared light, almost completely avoiding the active remote sensing techniques such as LIDAR and RADAR. All comments below should be viewed accordingly.

Members of the groups were interested in managing all types of aquatic systems, including wetlands, rivers, streams, lakes, coastal areas and oceans. Within these systems, people were hoping to measure a wide variety of water quality parameters (temp, nutrients, dissolved oxygen, clarity [Secchi], total suspended solids) and organisms (zooplankton, phytoplankton [chlorophyll], cyanobacteria, macrophytes, fish). Goals ranged from detailing patterns within one water body on a given day to monitoring a large number of water bodies on an annual basis.

The desired measurement targets of remote sensing using visible and infrared light discussed above can be classified into three groups: 1) not possible with current technology, 2) possible with current technology to varying degrees, and 3) established with current technology in some aquatic systems. Nutrients, dissolved oxygen, zooplankton and fish fall into category 1, as they have no direct effect on the wavelengths of light concerned. Category 2 includes macrophytes and cyanobacteria, while TSS, water clarity, phytoplankton and surface temperature fall into Category 3. It may be possible to indirectly some features in Category 1, nutrients, for example, by looking for tracers of nutrients such as CDOM or chlorophyll. Important factors to be considered for

the feasibility of any remote sensing system include size of water body, sampling frequency desired, availability of reference ("groundtruthing") data, availability of expertise, amount of funding and environmental conditions during data collection (such as clouds).

While no perfect solutions exist for using remote sensing to monitor aquatic ecosystems, currently available technology can serve some of the needs for managers of aquatic ecosystems. As remote sensing technology matures, the availability and accuracy of data will improve and become more useful to these managers. While it is clear that a significant commitment is necessary to develop a reliable remote sensing technique, the benefits of such techniques can be of incredible value once established.