CHAPTER 2

STATION PLATFORMS

2.1 INTRODUCTION

Deciding what type water quality monitoring station platform to employ is an iterative process. As part of the SSC Cycle, the selection process must assure that the data to be measured in the station platform will be of the required quality, and that the monitoring objectives will be met. There are many types of station configurations and designs, each one with its own strengths and weaknesses; so it is very helpful to have a general idea of the characteristics of different shallow water quality monitoring station platforms in order to select the best alternative that fulfills the monitoring objectives.

An outline of continuous shallow water quality monitoring station platforms is presented in this chapter. A more detail description of these configurations is provided in the following chapters:

- Chapter 4 describes the buoyant monitoring station platforms. Basic information on the buoyant systems for shallow waters is provided.
- Chapter 5 describes the fixed structure monitoring stations. The chapter contains construction standard operating procedures for three types of station platforms used at CBNERRVA.

2.2 TYPE OF PLATFORMS

Most continuous shallow water quality monitoring stations can be subdivided into two main categories: buoyant and fixed depth structured monitoring stations (Figure 2.1).

BUOYANT CONFIGURATIONS

Monitoring stations in which the monitoring sensors have certain degree of spatial mobility:

- vertically, for example by tides (*e.g.* surface buoy)
- horizontally, for example by currents (*e.g.* subsurface structure)

Many different buoyant monitoring stations exist for a wide range of near-shore, coastal and offshore applications.

FIXED STRUCTURE CONFIGURATIONS

Monitoring stations in which the monitoring sensors are located at a fixed position from the bottom substrate.

These stations can be classified into three categories:

DESIGNED PLATFORM	Monitoring stations that are specially designed by the user to fulfill the monitoring needs. These structures are generally deployed offshore. The sonde in these structures is generally placed on a fixed vertical position.
EXISTING STRUCTURE	Structures that already exist in the monitoring sites and the user takes advantage of them to set the monitoring station. The sonde in these structures is generally placed on a fixed vertical position.
ON RIVER & STREAM BANK STRUCTURE	The monitoring platforms are located on or close to the river or stream bank. The sonde in these structures is generally placed on an angle to the river or stream bank. These type of platforms can be divided into two groups, with or without equipment shelter.

- WITHOUT EQUIPMENT SHELTER: these stations comprise of a pipe anchored to the river or stream bank on an angle via some kind of structure (e.g. posts, pipes).
- WITH EQUIPMENT SHELTER: these stations are generally adaptations of the two well-known USGS sheltered structures (flow-through and sensor in-situ monitoring systems).

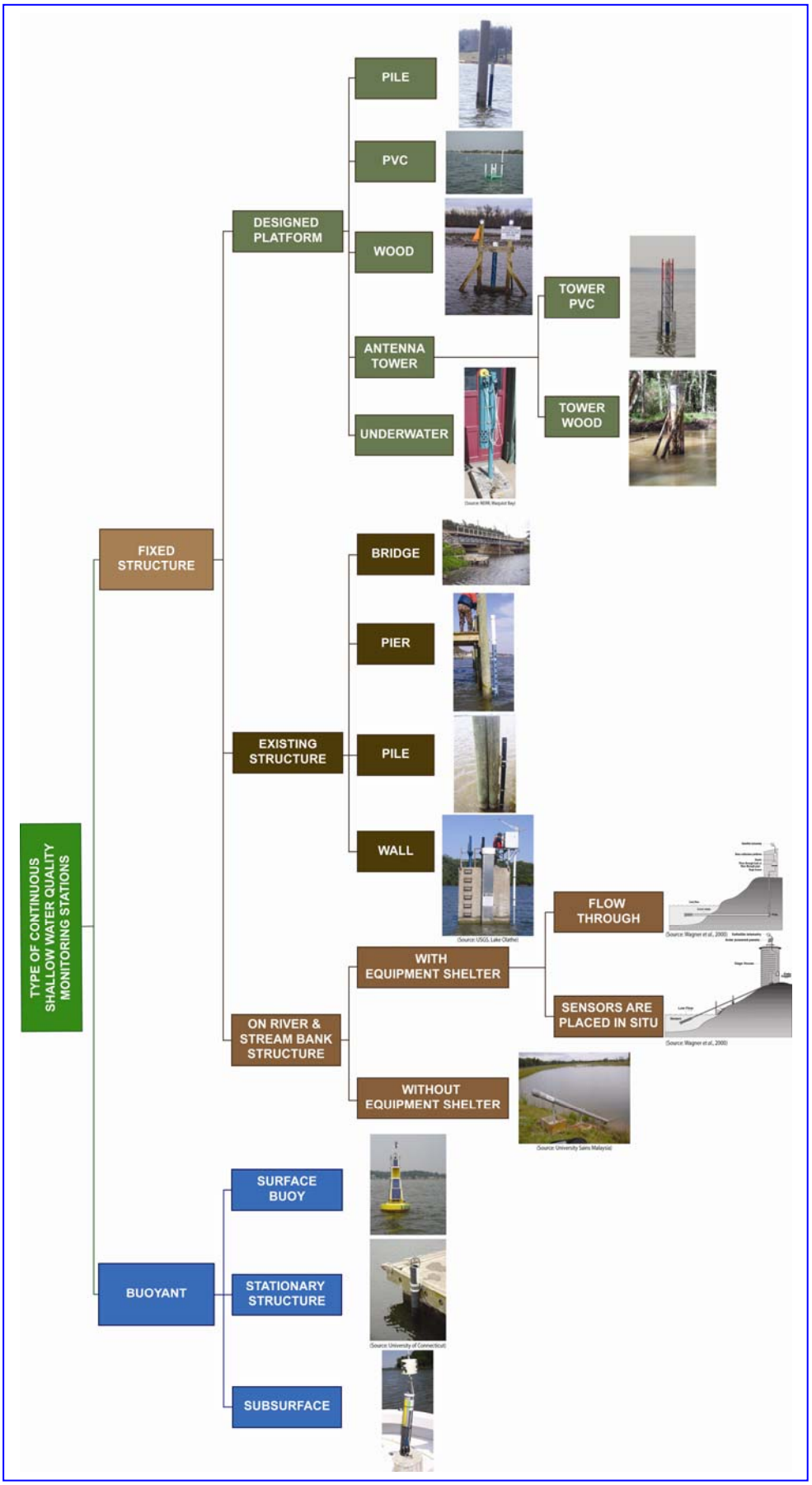

Figure 2.1 Types of continuous shallow water quality monitoring station platforms

2.3 DESIGN & SELECTION CONSIDERATIONS

The station configuration to be selected depends mainly on the settings of the monitoring location and the design requirements to comply with the monitoring objectives and data quality.

The station configuration selection process must address certain site-specific characteristics that provide the design framework for the station platform. These site-specific characteristics will trigger certain required design characteristics, or limit the utilization of specific types of station platforms. For example, if the monitoring site is located in deep water making hard to set a fixed station, a buoyant station platform maybe is the only viable option.

Due to the broad range of site-specific characteristics, most monitoring platforms would require custom modifications in order to obtain good quality measurements.

Some of the site-specific characteristics to address are:

Sampling depth	Permits
Water depth	Duration of monitoring project
Currents; Flow-Rate	Set-up Cost
Winds	Maintenance requirements and logistics
Wave action	Maintenance Cost
Tidal or water level range	Safety-Security for personnel and equipment
Yearly weather patterns	Water activity near the location (*i.e.* water sports)
Vegetation – Animal influence	Existing settings in the location
Bio-fouling potential	Community or interested parties concerns
Site accessibility	Data transfer possibilities

Sometimes, two or more stations are considered to best fit the design characteristics and it is difficult to reach a consensus of which station to select. In these cases multi-attribute criteria can be used to resolve the problem.

2.4 REFERENCE

Miles, Eduardo J. 2008. **The SSC cycle: a PDCA approach to address site-specific characteristics in a continuous shallow water quality monitoring project**. Journal of Environmental Monitoring:10, 604 – 611. DOI: 10.1039/b717406c.

2.4.1 Photo Reference

Flow Through and Sensors are Place in Situ Photos. Wagner, R.J., Mattraw, H.C., Ritz, G.F., and Smith, B.A., 2000. Guidelines and standard procedures for continuous water-quality monitors: site selection, field operation, calibration, record computation, and reporting. U.S. Geological Survey Water-Resources Investigations Report 00-4252, 53 p.

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University of Connecticut Photo. LISCOS **-**- The Long Island Sound Integrated Coastal Observing System. Norwalk Harbor Station. Department of Marine Science. University of Connecticut. http://lisicos.uconn.edu/about_nwkh.php

USGS Lake Olathe Photo. Water-Quality Study of the Lake Olathe Watershed, Northeast Kansas**.** http://ks.water.usgs.gov/studies/qw/olathe/

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