How to Use the Field Deployment Guide

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The ASFW Deployment Guide, therefore, is a checklist of information designed to guide both new and experienced users in the deployment of water-quality monitoring systems using sensors. System Selection guides users through the decision process for the type of monitoring system that will be needed. Site Selection covers the factors to consider in order to choose the best sampling location within your project constraints. The section on Instrumentation provides information on platform design, safety considerations, maintenance, and requirements for power and telemetry. Documentation covers recommendations for photo and written site and installation documentation.

Methods and Data Comparability Board

Aquatic Sensor Workgroup

• Rick Wagner, Andy Ziegler, and Eric Voivinkel, USGS
• Dan Sullivan, USGS, Workgroup co-chair
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March 24, 2010

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2.1. Location

2.1.1. Cross-section

2.1.2. Channel stability

2.1.3. Human influences

3. Equipment Location

3.1.1. Power Sources

3.1.2. Shelters, sondes, and other structures

3.1.3. Reliable access

3.1.4. Vandalism

3.2.1. Protect lines and sondes from the effects of freezing and thawing; ice may need more frequent charging. Miles (2008), Wagner et al (2006)

3.2.2. Debris damage Structures must be sufficiently robust to handle the impact of large, fast-moving debris flowing with the water. Wagner et al (2006)

3.3. Equipment

3.3.1. Power Sources

3.3.2. Equipment Location

3.3.3. Access/Infrastructure

3.3.4. Data Transmission

3.4. Extreme Conditions

3.4.1. Drying

3.4.2. Freezing

3.5. Service Intervals

3.5.1. In-stream aquatic plants

3.5.2. Terrestrial vegetation

3.5.3. Fouling Rate

3.5.4. Power requirements

3.6. Lab Analysis

3.7. Security

3.8. Maintenance

3.8.1. Check and maintain appropriate equipment

3.8.2. Check and maintain appropriate equipment

4. Documentation

4.1. Field Documentation

4.1.1. Data collection

4.1.2. Photo documentation

4.2. Site documentation

4.2.1. New site description

3.1.2. Vehicle Access

Ensure that your field vehicle can handle the likely range of conditions at your site(s). Consider the type of terrain you may encounter, the season and vegetation removed as needed. Miles (2008)

3.1.3. Reliable access

Provide access to the site and instruments during all conditions. Miles (2008)

3.1.4. Vandalism

Aside from attended monitoring, always consider vandalism. Always make the site as inaccessible as possible. Wilde, ed. (2006)

3.2.1. Shelters, sondes, and other structures

Equipment must be sufficiently robust to handle the impact of large, fast-moving debris flowing with the water. Wagner et al (2006)

3.3.1. Power Sources

Unattended: Can be powered by batteries and/or solar panel, reducing electrical hazards. Give appropriate battery and maintenance intervals for biofouling and sensor servicing. Wilde, ed. (2006)

3.3.4. Data Transmission

Typically, data collection should occur at the same point regardless of flow conditions. However, during high streamflows, the sonde (or sensors) can be displaced horizontally and vertically. Wagner et al (2006)

3.4. Extreme Conditions

3.4.1. Drying

During extreme drought conditions or evapotranspiration causes channels to shrink, potable water can become scarce. Miles (2008), Wagner et al (2006)

3.4.2. Freezing

Freezing is a highly site-dependent phenomenon that depends on the evolution of conditions and the site's thermal history. Wagner et al (2006)

3.5. Service Intervals

3.5.1. In-stream aquatic plants

All monitoring locations should be free of vegetation in order to maintain consistent and high-quality data. Wagner et al (2006)

3.5.2. Terrestrial vegetation

Terrestrial vegetation can inhibit site access and damage intake and communication lines; trim vegetation, and the appropriate vehicle that allows for site access in all conditions. Wagner et al (2006)

3.5.3. Fouling Rate

Fouling rate is highly site dependent and should be taken into consideration when developing appropriate monitoring intervals. Wilde, ed. (2006)

3.5.4. Power requirements

Power requirements depend on data needs. If the study requires real-time transmittal, consider how the power sources and/ or sensory devices will be charged. Wilde, ed. (2006)

3.6. Lab Analysis

Clean orifice line is important, therefore consider sediment transport not only for site selection but also for site maintenance. Wagner et al (2006)

3.7. Security


3.8. Maintenance

3.8.1. Check and maintain appropriate equipment

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3.2. Flow and Stage

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