



Natural Resources Conservation Service  
101 SW Main Street; Suite 1300  
Portland, Oregon  
Phone: (503) 414-3247 Fax: (503) 414-3277

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## Irrigation Water Measurement

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### Introduction

- The material provided in this section is intended to serve as a framework for irrigation water measurement training.
- Trainers should modify the training material referenced as necessary to achieve the planned skill level for the trainees.
- Trainers are encouraged to include locally developed training materials to complement and/or supplement the referenced material.
- As new training materials are developed by trainers, they are encouraged to furnish copies to the National Employee Development Center for inclusion in future versions of the assembled material.

### Suggested Objectives

1. Explain the importance of measuring devices.
2. List and explain the various measuring devices available for irrigation conveyance flow measurement.
3. Describe procedures for using various measuring devices available for irrigation conveyance flow measurement.
4. Apply appropriate technology to select the measuring device best suited to the planned conveyance system.

### Outline

- I. Introduction
- II. Body
  - A. Importance of water measurement devices
  - B. Measuring Devices
    1. Open channel measuring devices
      - a. Weirs
      - b. Flumes
      - c. Gates and Orifices
      - d. Current meters
      - e. Acoustic meters
      - f. Others
    2. Closed conduit measuring devices
      - a. Differential head meters
      - b. Velocity meters
      - c. Acoustic meters
      - d. Other
    3. Secondary Measuring Devices
      - a. Head and pressure measurement devices
      - b. Volume totalization devices
      - c. Data storage and transmission devices



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- C. Procedures for Using Measuring Devices
- D. Selection of Best Device for Site
- III. Summary

### Reference Material

- Irrigation Guide, Chapter 7,9.
- Bureau of Reclamation, "Water Measurement Manual", Third edition.
- ASAE, "Flow Measuring Flumes for Open Channel Systems" ISBN-929355- 15-6.
- NEH-15, Chapter 9.
- EFH, Chapter 3.
- NM Video in Production.
- Manufacturer's Handbooks.

### Toolbox Materials

- Publication "The Surface Irrigation Manual", Chapter 1, Cal-Poly (Located in the Soil-Water-Plant Relationship Toolbox)
- Publication "Flow Measuring Flumes For Open Channel Systems", ASAE
- Video "Step out of the Stone Ages, Water Works: A Guide to Effective Water Measurement", U.S. Bureau of Reclamation.
- Publication ILRI publication 58 "Water Measurement with Flumes and Weirs"
- Video "Irrigation Flow Measurement in Piped Systems", U.S. Bureau of Reclamation

### Facilitation Options

- Self-paced,
- Facilitator guided, or
- Formal training course.

### Evaluation

Each state should develop an evaluation procedure which addresses the level of competence before and after training.