



The Maryland Biological Stream Survey Training and Certification Program

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What's the MBSS?

- Began in 1995
- Probabilistic and targeted sites
- Fish, benthic macroinvertebrates, other fauna, physical habitat, Water Quality, Catchment LU/LC
- IBIs for fish and benthos

MBSS Data and Method Uses

- 303(d) list
- Antidegradation (Tier II)
- Designated Uses & Criteria Development
- NPDES/MS4
- Restoration Monitoring
- Land Preservation Programs
- Endangered Species
- 64 peer-review publications

Stream Biomonitoring in Maryland – WHO?

Anne Arundel Co., Baltimore City, Baltimore Co., Carroll Co., Frederick Co., Harford Co., Howard Co., Montgomery Co., Prince Georges Co., Biohabitats, Chesapeake Environmental Mgmt., Coastal Resources, Doss Engineering, EcoAnalysts, KCI Technologies, Limno Tech, McCormick-Taylor, RK and K, Straughan Environmental, URS, Versar, Tetra Tech, Washington COG, Maryland National Capital Park and Planning Comm., University of MD., State Highways Administration, Maryland Dept. of the Environment

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Why Certification Now?

- Logical extension of MBSS trainings
- Increased non-DNR use of MBSS methods
- Enhance data sharing
- Add datasets to StreamHealth website
- **Data of known quality in regulatory programs**

MBSS crew members
participate in **the same
training and testing** as
non-DNR folks applying
for certification

Certification Requirements (macroinvertebrates)

Field Sampling (3 years)

- Spring training
- Written test (90% = passing)
- Field audit (duplicate samples)

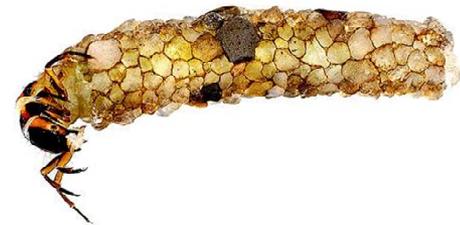


Macroinvertebrate Laboratory Processing/Subsampling (3 years)

- Lab training
- Written test (90% = passing)
- Macroinvertebrate subsample audit

Macroinvertebrate Taxonomy

- SFS (NABS) EPT and Chironomidae certifications



Certification Requirements (macroinvertebrates)

Field Sampling – at site

- Check equipment
- Audit sheet
- Habitat selection
- Two samples
- Process and preserve samples
- Both samples processed and IDed in DNR lab (genus)
- Compare BIBIs

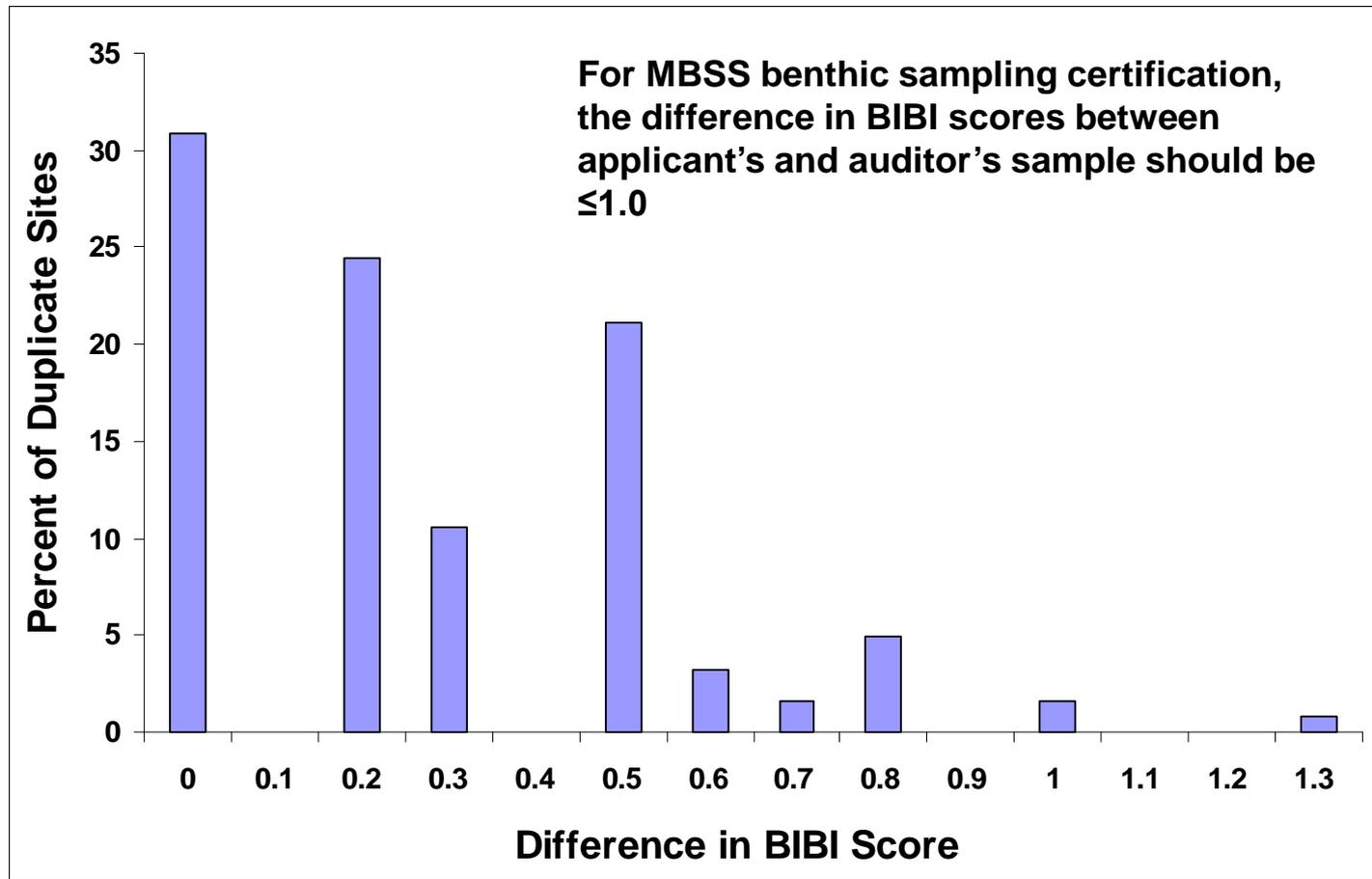


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123 MBSS sites had duplicate benthic field samples (2000-2013)



89% of sites had a difference in BIBI scores ≤ 0.5

Certification Requirements (macroinvertebrates)

Lab Processing and Subsampling

- Overview and demo
- Sample receipt and check-in
- Washing sample
- Picking efficiency
- “Duplicate” subsample to compare to original
- Storage



Certification Requirements (fish)

Fish Crew Leader (1 year)

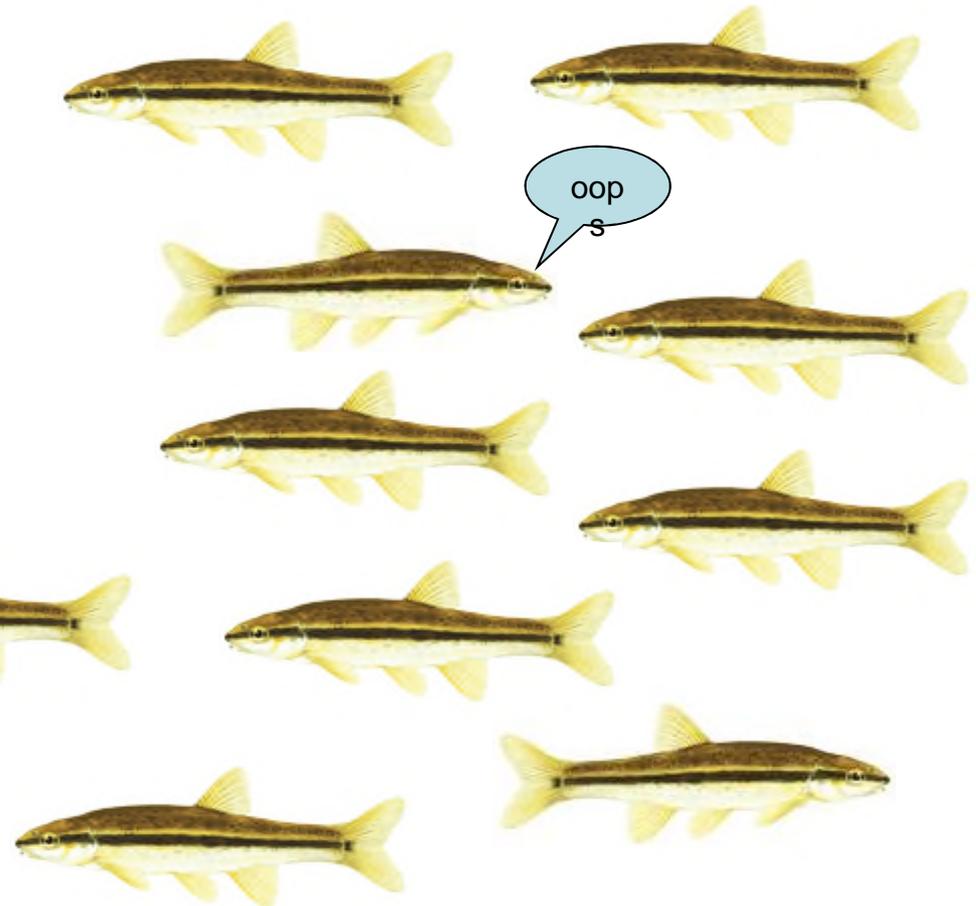
- Summer training
- Written test
- Field audit

Fish Sampling (1 year)

- Summer training
- Written test

Fish Taxonomy (1 year)

- Summer training
- Lab taxonomy test
- Field audit
- Provide vouchers for verification



Fish Crew Leader Field Audit

- Equipment
- Safety
- Electrofishing
- Fish processing
- Decontamination



Fish Taxonomy

Lab Practical

- 40 species
- 90% = passing

Field Audit

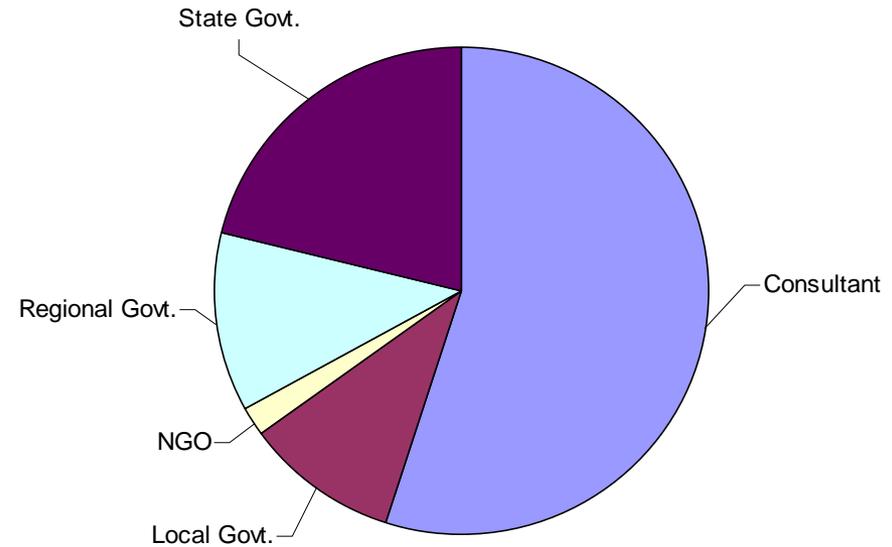
- 15 species (100% = passing)
- Vouchers (5 individuals/species)



Results

Macroinvertebrate Field Sampling

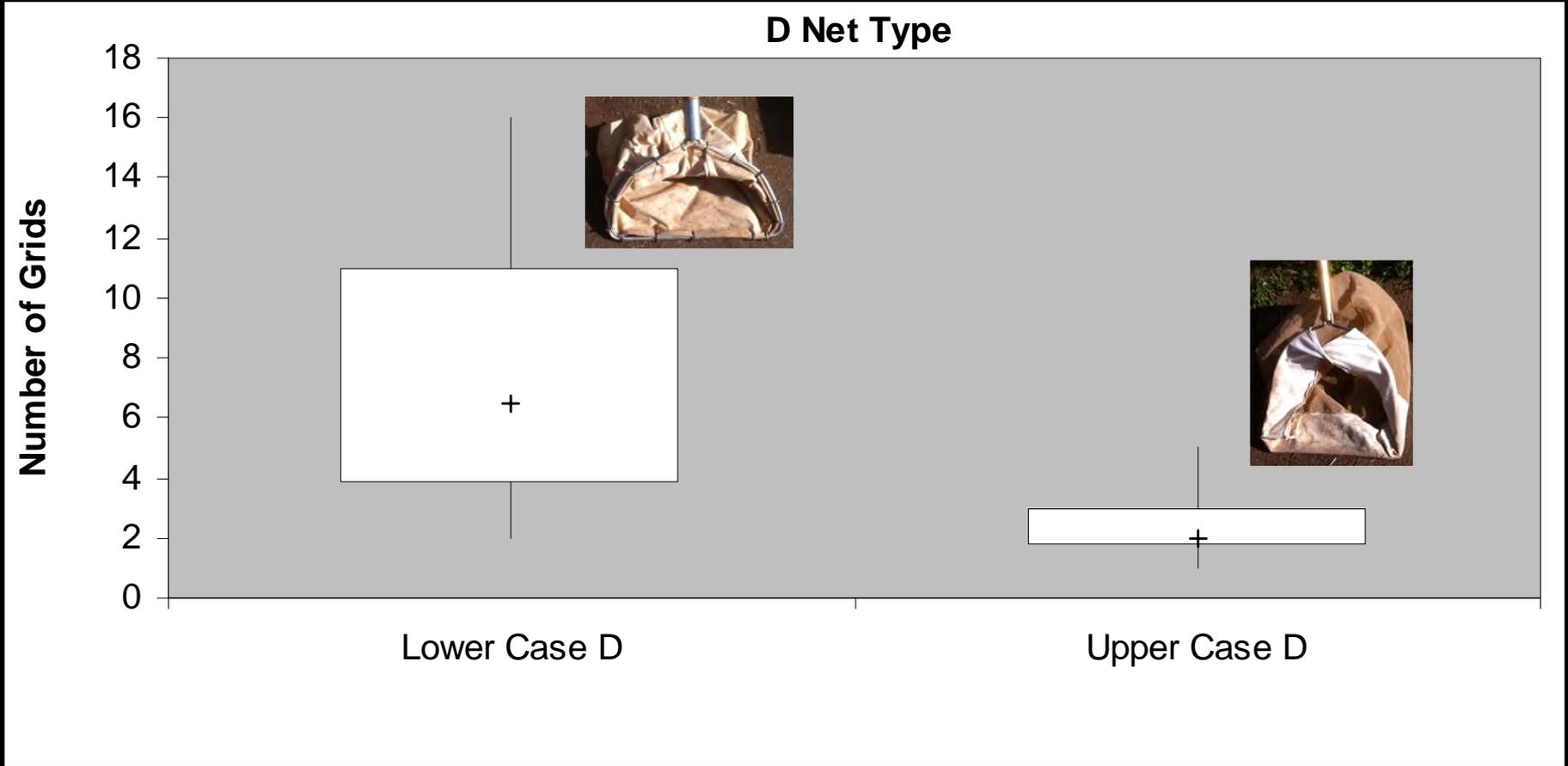
- 54 Applicants – 24 (2012); 30 (2013)
- All but two passed written test
- Mean BIBI difference = 0.46
(range was 0 to 1*)
- 52 Certified – 23 (2012); 29 (2013)



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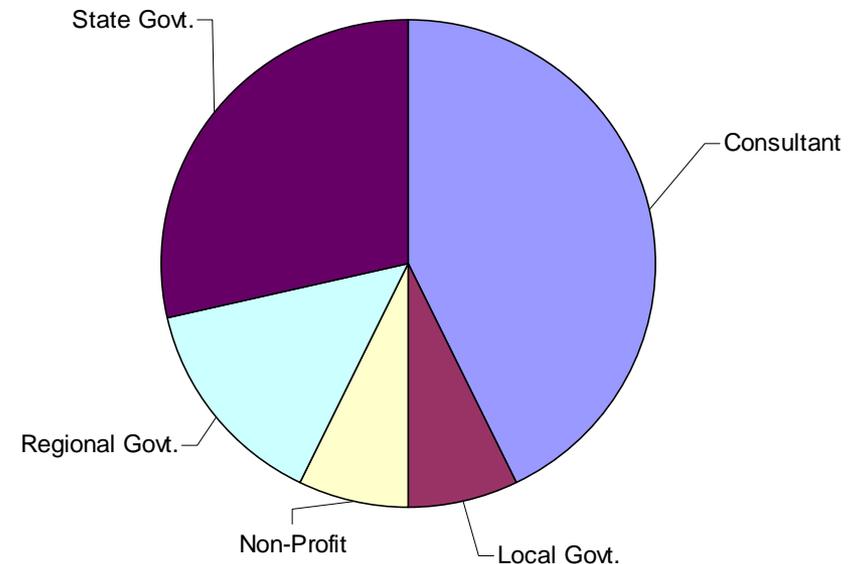
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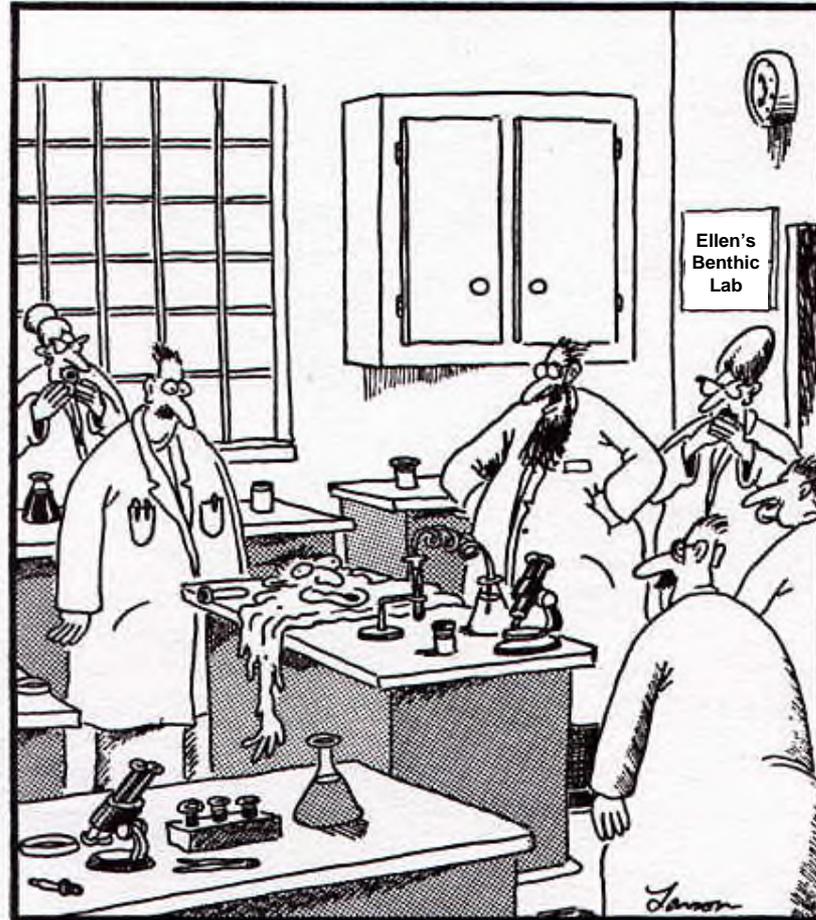
Results

Benthic Lab Processing and Subsampling

- 14 Applicants - 10 (2012); 4 (2013)
- Everyone passed picking efficiency test
- Everyone passed written test
- 14 Certified - 10 (2012); 4 (2013)



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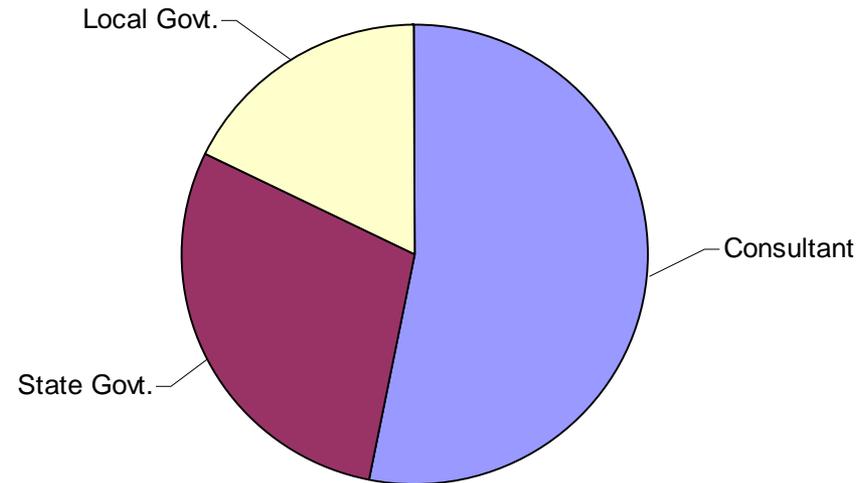


Another MBSS benthic lab certification applicant succumbs to the pressure.

Results

Fish Crew Leader

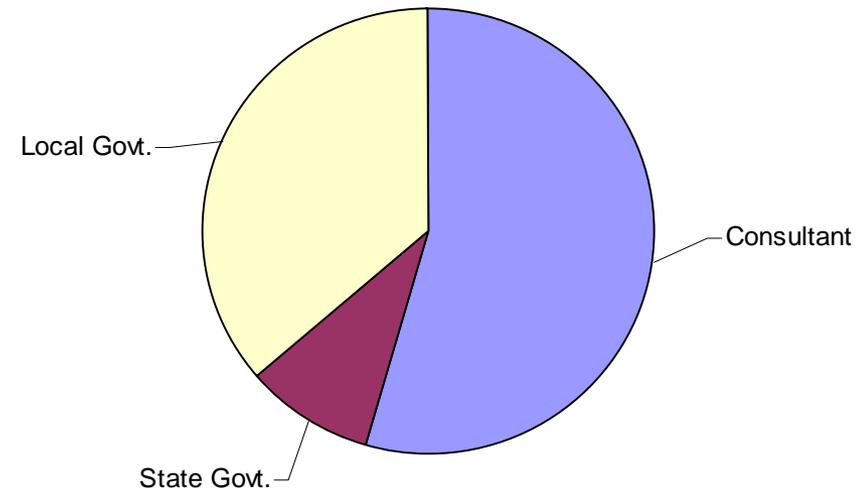
- Applicants – 10 (2012); 12 (2013)
- Everyone passed written test
- Certified – 10 (2012); 12 (2013)
- Scheduling challenges!



Results

Fish Taxonomy

- Lab test: Range = 43 – 100%; Mean= 82%
- Passed lab practical – 9 (2012); 10 (2013)
- Certified – 10 (2012); 9 (2013)



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- [Maryland Water Monitoring Council](#)
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Maryland Biological Stream Survey



Maryland Biological Stream Survey Registry of Certifications

This page lists those applicants certified in MBSS protocols. These applicants are divided into sections based on what certifications they have completed.

Applicants Certified in MBSS Benthic Macroinvertebrate Sampling (Certification valid for three years)

Name	Email Address	Affiliation	Year Certified
Scot Aitkenhead	sdaitkenhead@mccormicktaylor.com	McCormick Taylor, Inc.	2012
James Ashby	jashby@wrallp.com	Whitman, Requardt & Associates	2012
Holly Badin	hbadi@menv.com	Maryland Environmental Service	2012
Mike Bilger	mbilger@ecoanalysts.com	Eco Analysts, Inc.	2012
Susanna Brellis	susanna.brellis@kci.com	KCI Technologies, Inc.	2012
Zach Buecker	zbuecker@cemsience.com	Chesapeake Environmental Management Inc.	2012
Kevin Bull	kbull@dnr.state.md.us	Maryland Environmental Trust	2012
Dawn Chandros	dchandros@versar.com	Versar Inc.	2012
Megan Crunkleton	megan.crunkleton@kci.com	KCI Technologies, Inc.	2012
Dennis Genito	dgenito@baltimorecountymd.gov	Baltimore County Department of Environmental Protection and Sustainability	2012

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Upcoming Events

- **Save the Dates! MBSS 2013**
Spring Training - February 25
Summer Training - May 28-31
[Learn More](#)
- **Stream Waders Training**
February 9th - Ridgely
February 23rd - Rockville
March 2nd - Grantsville
[Learn More](#)

Recent Streams News

- ▶ [New DNR Guiding Principles for River and Stream Management](#)
- ▶ [Powerpoints for MBSS Trainings are available for download](#)
- ▶ [MBSS Round 3 Report Now Available](#)
- ▶ [Monitoring Dam Fish Passage on the Patuxent](#)

Fees

	Non Profit	For Profit
Spring Training	\$75	\$75
Summer Training	\$200	\$200
Benthic Sampling	\$115	\$675
Benthic Laboratory	\$100	\$400
Fish Crew Leader	\$100	\$400
Fish Taxonomy	\$25	\$100
Fish Sampling	\$0	\$0

What's Next?

- Physical Habitat
- Geomorphological Assessment
- Salamander, Mussel, Crayfish Sampling
- Data Processing and Analysis



Questions?

7/5/2011