Aquaculture Research and Demonstration Facility:

Capabilities and Highlights

Cooperative Extension•Delaware State University

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The Aquaculture Research and Demonstration Facility occupies 13 acres of the northeast corner of Delaware State University's Dover, Delaware campus. The facility supports research in aquaculture and fisheries, and outreach and academic programs. Research efforts include identifying suitable aquaculture species and management techniques for use in the mid-Atlantic region. The Facility exists to foster the creation and growth of a local aquaculture industry in a manner that will be economically and environmentally sustainable.

Ponds

The pond facility was completed in the spring of 1997. Engineering and construction supervision for this no-discharge system was provided by the USDA Natural Resource Conservation Service (NRCS). The pond facility is highlighted by:

- 34 earthen ponds arranged in an array to enhance our research capabilities
  - 33 research ponds
    - 20) 1/8 acre
    - 10) 1/4 acre
    - 2) 1/3 acre
    - 1) 1 acre
  - 1 reservoir pond, 2.5 acres
- No discharge
  - Eliminates effluent entering natural watershed
  - Reduces possibility of non-native species impacting environment
- Multiple water supplies
  - Ground water wells with high quality water for fish culture
  - Recycled pond water for ease of conditioning and filling ponds
- Electric for aeration (110v/220v)

ADRF undergraduate students, Chelsea Morton and Brittany Chesser, counting fish to stock one of the research ponds. Photo: Grant Blank

Here are two of the seven recirculating systems in the ARDF wetlab. Each of these tanks are 1000-L and can be randomly assigned to either of the systems in this array to optimize our experimental design. Photo: Lori Brown

Recirculating Lab

In 2005, a 3,000 ft2 recirculating laboratory was erected at the northwest end of the pond facility. Current features include:

- A total capacity of over 14,500 gallons comprised of 41 tanks
- 7 independent recirculating systems
- Water temperature control
- Ground- and pond-water supplied
- Can be run as recirculating systems or flow-through using either ground or pond water
- Saltwater capable

Aquaponics

In the spring of 2011 we completed construction of two, airlift-driven, aquaponic systems. We are currently operating these two separate, 2,500-gallon deep-water systems within a greenhouse growing several species of fish in combination with plants.

Students in the Fall 2014 Aquaculture class measure basil plants growing in the aquaponics greenhouse. Photo: Dennis McIntosh

Support Facilities

In addition to our pond, recirculating lab, and aquaponics production capabilities and systems, we also maintain support facilities necessary to conduct applied research. These facilities include an algae culture lab, a water quality analysis lab, a temperature and humidity controlled feed storage room, and a fish processing area. Collectively, these facilities enable us to work with many life stages of freshwater or marine species.

Species Cultured

To date, we have worked with a number of different species of fish, shellfish and plants in a variety of projects. Below is a partial list of the species we have had at the ARDF.

Atlantic sturgeon	Channel catfish	Fathead minnow
Golden shiner	Goldfish	Grass carp
Hybrid striped bass	Koi	Largemouth bass
Mosquito fish	Mummichog	Rainbow trout
Smallmouth bass	Tilapia	Yellow perch

Freshwater mussel	Freshwater prawn	Oyster
Red swamp crayfish	Saltwater shrimp	White river crayfish

Iris	Lettuce (butter head, Romaine)
Lizard tail	Cilantro
Seashore mallow	Radishes
Swamp hibiscus	Arugula
Basil	Mustard greens

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Aquatic Sciences

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