Sustainable Agriculture Research and Education Program
Producer Grant Final Report

1. The goal of our project was:
To design build and test a simple aquaculture dockside elevator system.

2. Our farm has increased in productivity since we received our producer grant. This project allowed us to increase the size of our operation substantially by removing a major labor constraint. At the beginning of the project we had 40 oyster floats. This number has increased to 78 at the time of this report. These floats contain a total of 435 oyster bags instead of the original 200 (5 bags/float) and 10 bags for seed floats. Because of the new lift we expect to be able to more than double our production next year. In addition we were able to add a skiff to our operation because we can store it out of the water on the lift when it is not in use. With the skiff and the lift we can now expand our production area away from the dock and have applied for a 10-acre lease. This will allow us to eventually build out to 2,000 oyster floats.

3. Who were your cooperators and what were their roles in the project?

Our list of collaborators changed over the period of the grant.

Project Director Richard Pelz
President Circle C Oyster Ranchers Association Inc.
42366 Manor Drive
Mechanicsville, MD 20659
Coordinated preliminary design, installation on the dock, testing and tuning the system.

Jackie Takacs Replaced Rich Bohn as
Sea Grant Area Agent Cooperative Extension Service
Her office moved to:
Chesapeake biological Laboratory
P.O. Box 38
Solomons, MD 20688
Jackie worked as an advisor and will disseminate information on the project to other aquaculturists.

Bradley H. Powers, was promoted to
Assistant Secretary of Agriculture
Maryland Dept. of Agriculture
50 Harry S. Truman Parkway Annapolis, MD 21401
He will disseminate information on the project to other aquaculturists through the Aquaculture office now run by Roy Castle.

Donald White was replaced by Ken Hafner as Coordinator for the
Southern Maryland Resource Conservation & Development, Inc.
303 Post Office Road, Suite B4A
Waldorf, MD 20602
He is helping with this final report, and will disseminate information on the lift in our region.

Jon Lore owner of St. Jeromes Aquaculture Inc.
helped and provided manpower for installation of the lift.

Dr. Thomas H. Hopkins, President*

Maryland Aquaculture Association
P.O. Box 129
Boyds, MD 20841-0129
He is helping to disseminate information to the aquaculture community.

4. What we actually did in our project varied significantly from our original plans. These changes resulted in significant cost savings.
The lift proved to be so efficient that we decided that for now we only need one. Once operations expand to 500 or more Floating Oyster Reefs™ we plan to add the second lift.

Modifications of design and specification changes
The first change that was made was our choice of materials from stainless steel to heavy gauge galvanized steel. Upon consulting with several marine engineers, stainless steel was eliminated. The reasons were two fold.

a) Stainless steel does not stand up to wear as well as we thought. We were told we could expect significant abrasion problems with the tracks. In addition electrolysis can be more significant where dissimilar metals come in contact. Stainless steel has different formulas for different applications and various types of hardware. Even if all of the parts were "stainless steel" the alloy formulas would differ making electrolysis a major problem.
b) Stainless steel is significantly more expensive than galvanized steel. The galvanized steel on these lifts has a projected life of 20 years.

Dual motors with single station control were chosen over the original design to eliminate jamming of lift. Consultation with the engineers revealed that due to irregularities in pilings and seasonal changes due to ice and other weather conditions would make keeping the tracks closely aligned a major maintenance problem. Also cable pick-up could change if the wraps overlapped causing one side or the other to lift faster jamming the lift. With independent motors and controls the operator could then lift or lower one side independently of the other. This also gave some unexpected advantages. (see the section on use.)

Due to legal liability the lifts cannot be used as an elevator to lift people. However, personnel can be on the lift when it is not in motion.

The weight bearing capability was increased.

Acquisition of materials:

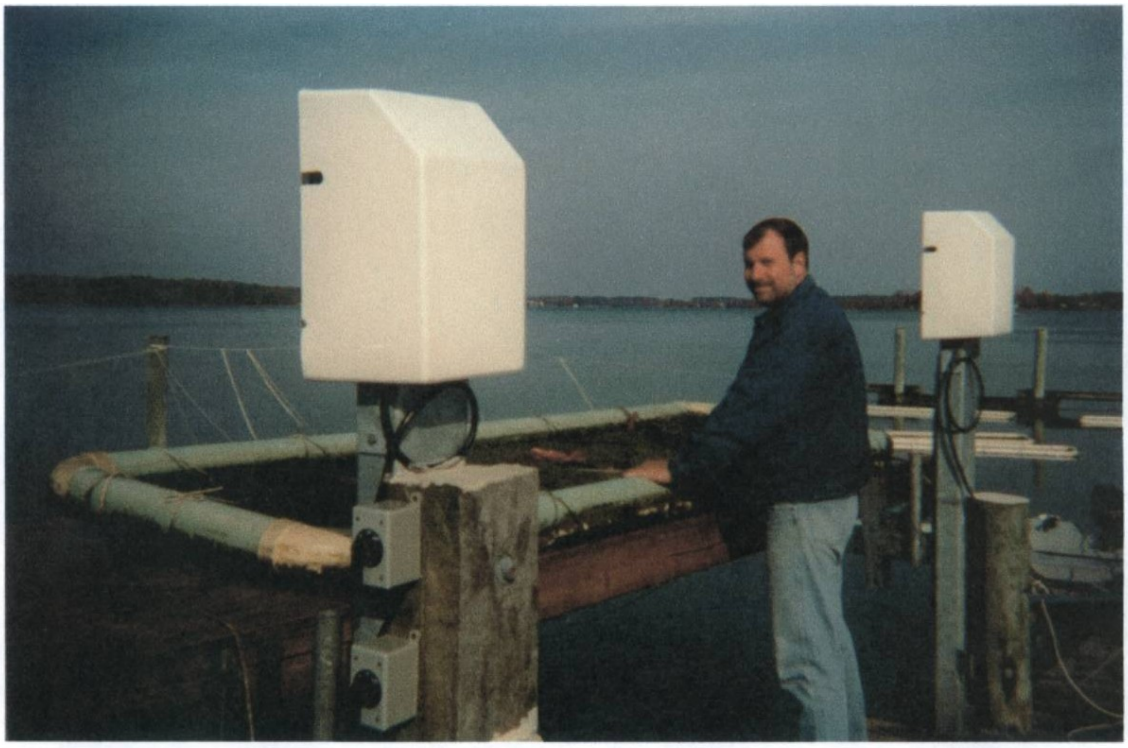
Initially we had planned for several machine shops to manufacture various specialty parts for us, however they lacked expertise in marine situations and it quickly became apparent that there would be a communication problem between them, our various advisors and us. Several boat lift installers were then contacted. This did not appear to be working either since they did not really understand what it was we were trying to accomplish. However, this led to a contact with an Annapolis based manufacturer of boatlifts. Several trips were made to their facility in order to go over various aspects and with their staff engineers. The personnel had extensive experience with a full range of lifts and dock installations. With them we came to a design that both the engineers felt would work and we felt would fit our needs. Circle C contracted with them to produce the independent lifting arms, tracks, motor mounts, and ground fault controls etc. for each end of the lift. The balance of the material used in the project was easily obtained from local hardware and lumber stores.

Installation

Circle C with the help of St. Jeromes Aquaculture Inc. did the installation. The dock deck was extended to close the gap between the lift platform and the dock and to provide workspace around the lift. A 4 by 14 platform was then constructed on the lift arms in such a way as to allow independent operation of the arms.

4. What we accomplished

We gained a lift, which can move large and heavy objects safely into and out of the water. This float weighs around 400 pounds.



We gained a workbench for the dock which can be adjust to a comfortable height for someone using it.

We gained a dive platform that can be either above or below the water surface as needed.

We gained a stable workbench for working while in the water.

We gained personnel access to and from the dock into the water using the platform as a midway point between both surfaces.

We gained out of water storage for a small boat. In this picture, the stern of the boat is floating while the bow is sitting high and dry. In this position the boat is easily boarded and floated off the platform. The skiff can be brought onto the lift much like it would be on a beach. The operator just steps out onto the lift and can then pull it up the rest of the way. He / she can then climb up onto the dock and use the lift to remove the skiff from the water. Because the arms can independently swivel the skiff can easily be drained of rainwater just by pulling the drain plug and dropping the stern. The lift eliminates the need for a boat slip along the dock, which would take up valuable production space. It also reduces the vulnerability of the skiff to wave

and ice damage. Since the boat is stored out of the water it eliminates the need for anti-fouling compounds which are detrimental to our oyster production.
We significantly cut labor for routine operations

We cut equipment losses due to handling damage.

Worker safety was greatly improved.

Much heavy lifting was eliminated.

This kind of congestion on the dock was eliminated.

We now assemble our 3'x10' floats like this. Since our docks is only 6 foot and the lift is alongside we no longer lose precious deck space during assembly.

We now fill our oyster floats with seed oysters or remove market oysters using the lift as a workbench. The lift is then lowered to the water and inclined with one end submerged. At this point a worker can step down onto the platform and from there into the water. With a gentle pull the entire reef can be slid into the water where it floats and can be towed to its mooring position. Harvesting is done in the reverse order. This allows for a 400-pound float to be raised intact without putting excess stress on the floatation pipe.

The lift adds immeasurably to the safety of the operation reduces operating time while increasing efficiency. Maintenance of equipment occurs more readily because it is easier to accomplish. Expansion of the enterprise is now feasible due to the cost savings and the increased speed of harvest and deployment of equipment.

6. Specific site information relevant to our project: The system does need to be attached to either a dock or a bulkhead and needs to have just under 4 feet of water to allow submergence of the platform. This depth appears to be the optimum depth because the platform can then be used as a stable workbench for someone standing in the water beside it.

7. Economic findings relevant to our project:
Labor was significantly reduced. Getting a float onto the dock took 2 people 30 minutes and required disassembly of the unit in the water. One person can now do this in about 1 minute. The lift eliminates the need to get into the water and disassemble the unit. In addition the float can now be raised to workbench height alongside the dock. With 78 floats in the water this reduces harvest labor costs by $750. Sometimes floats become damaged and begin to take on water and sink. With the lift, these floats can be slid onto the submerged platform and raised to dock height where the water filled float can be slid onto the dock without damaging it. In the past the float had to be disassembled in the water. It was very difficult and dangerous to remove the damaged float from the water. This operation usually resulted in a large amount of damage to the float. This summer 5 floats needed to be replaced. The saving in labor and materials was equal to the price of 5 new floats or about $150. Launching production floats became significantly easier and less time consuming. The time for this operation was cut in half. 20 minutes labor was saved on each float for 78 floats this comes to 26 man-hours. With labor costs calculated at $10 per hour this is another $260. Cost savings in the first season of operation will total $1160. This expected to be significantly higher in next year.

8. The project resulted in a solid solution to our problem. Future design improvements will include the addition of steps to make getting on and off the lift easier both from the dock and from the water. Another improvement will be to widen the platform from 4 to 8 feet doubling the working surface area. Some new ideas about other ways we can use the lift. The lift can be used as a dive platform when doing inspections of oyster floats and retrieving items dropped overboard. The work platform can easily be placed at or near the surface of the water either above or below it. Since the lift was placed in relatively shallow water (4 feet at high tide) it can be used as a workbench for personnel in the water. This eliminates the safety hazard of constantly climbing in and out or the time consuming act of wading 100 feet through the water to the shore getting the item and then walking back. Another projected use of the platform is the capture of invertebrates and small fish that are associated with the oyster floats. Since we have been anticipating selling various small crustaceans and minnows that grow inside our oyster bags we have obtained the necessary permits. The next step of course is to design a collection system for these animals, which can be added to the lift platform.

9. We will continue to use the lift and expect to find many new uses for it.

10. What do you tell other producers about your project and the results? That the lift is a huge labor saver and my back feels better because of it. I tell them that we got a SARE grant to help pay for it.

11. Our outreach program:
We have had around 100 guests to the oyster ranch since we installed the lift and as part of the tour we usually demonstrate its use. Many of these visitors are investigating aquaculture as a profession. Another significant group visited on November 11, 1998 the Governor's Agriculture Advisory Committee led by Secretary "Bud" Virts toured the site and were given a demonstration of the lift. There were approximately 25 people in the party. Most of the local extension agents have been shown the lift, as well as, members of the County Economic Development office, and some local watermen have had it demonstrated for them. We have posted information and a picture of the lift on our Website at http://www.paxp.com/circ_c/ and faxed the attached news release to the list of organizations noted in our grant application.

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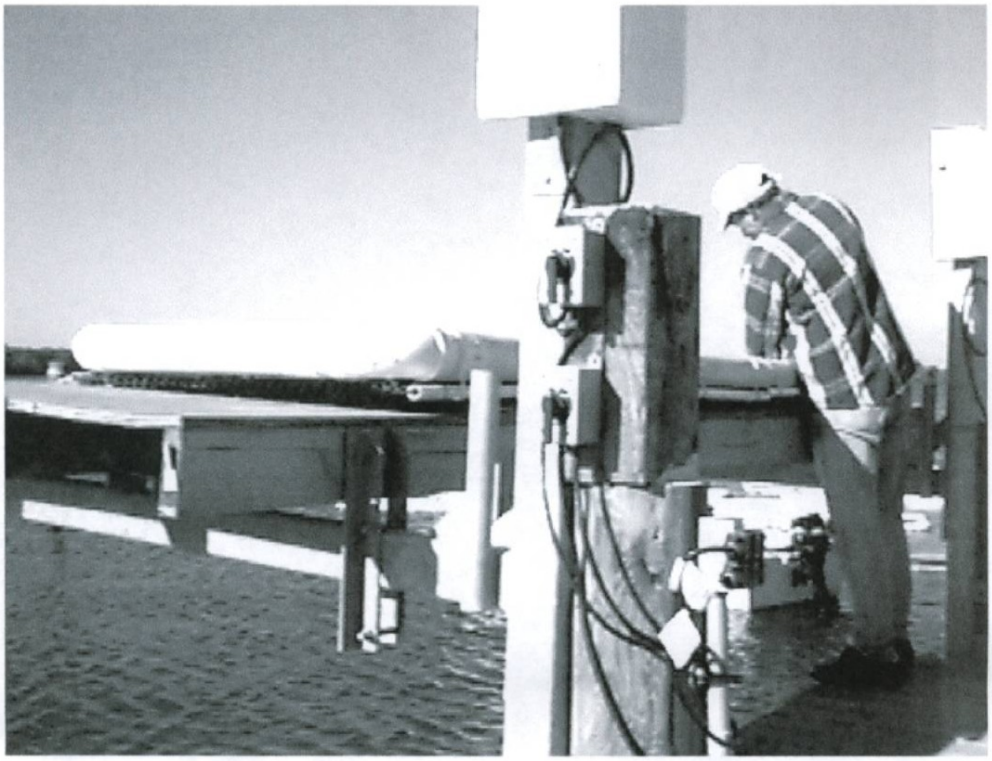
42366 Manor Drive
Mechanicsville, MD 20659 301-373-8662

New Aquaculture Lift boosts Circle C Oysters.



We now assemble our 3'x10' floats like this.

The new lift can move large and heavy objects safely into and out of the water. The oyster float being assembled here will weigh over 400 pounds when it comes back up on the lift.

The lift doubles as a workbench for the dock, which can be adjusted, to a comfortable height for anyone using it. This bench can be used either on the dock or in the water. We have used it for a dive platform that can be set above or below the water's surface as needed. With a couple of steps added onto the side of the dock it can become part of a staircase leading down to the waters surface. When not in use we store our 14-foot skiff Hi N Dry. The lift has resulted in significant labor savings. We cut equipment losses due to handling damage and worker safety was greatly improved. Because the lift is beside the dock it reduces congestion and clutter on the deck which is really important when your dock is only 6 feet wide. My back tells me it has already paid for itself this harvest season.

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