

Water Quality Trading and Generating Nutrient Credits from Oyster Harvests

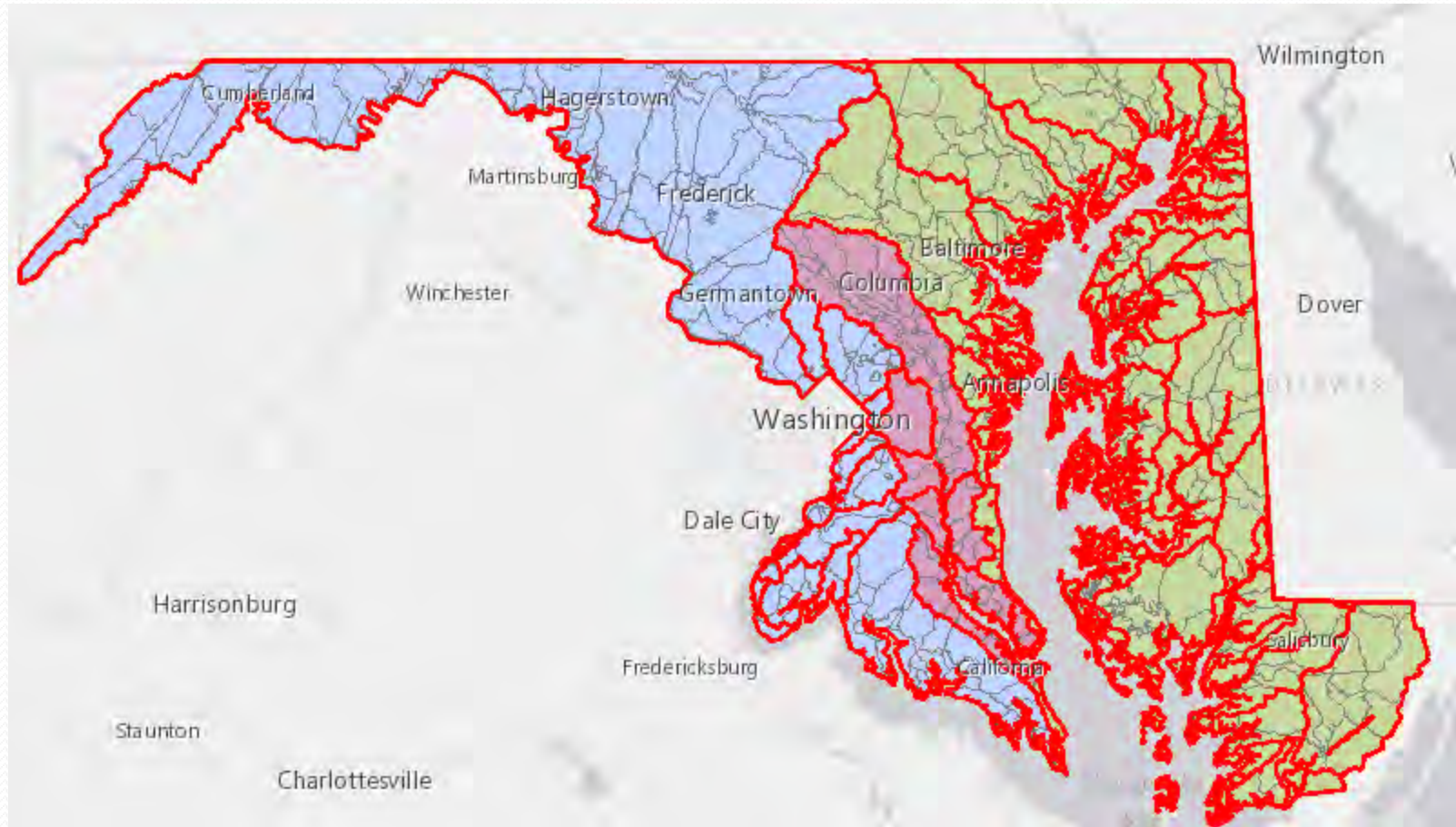
Gregorio Sandi – MDE
Maryland Shellfish Aquaculture Conference
February 12, 2019
Gregorio.Sandi@maryland.gov

Maryland Water Quality Trading

- Regulations were promulgated in July 2018
- Purpose: To create a market based approach to attract public and private participation to enhance Maryland's efforts to protect and restore water resources throughout the State
- Aquaculture was not explicitly included in the current regulations, but MDE has come up with a method that is consistent with the trading regulations and Chesapeake Bay Partnership recommendations

Trading Regions

- Designed to protect local water quality



What generates nutrient credits from aquaculture?

- Chesapeake Bay Partnership expert panel report establishes guideline for credit

Limited to:

- Private Oyster Aquaculture (POA) in tidal waters
- Aquaculture Types:
 - Off-bottom using hatchery-produced oysters
 - On-bottom using hatchery-produced oysters
 - On-bottom using substrate addition

Oyster Credit Generation

Default Estimates						
Oyster Size Class Range (inches)	Size Class Midpoint (inches)	Size Class Midpoint (mm)	Content in Oyster Tissue (g/oyster)			
			Diploid*		Triploid**	
			Nitrogen†	Phosphorus‡	Nitrogen†	Phosphorus‡
2.0 - 2.49	2.25	57	0.05	0.01	0.06	0.01
2.5 - 3.49	3	76	0.09	0.01	0.13	0.01
3.5 - 4.49	4	102	0.15	0.02	0.26	0.03
4.5 - 5.49	5	127	0.22	0.02	0.44	0.05
≥ 5.5	6	152	0.31	0.03	0.67	0.07

- Chesapeake Bay Expert Panel Credit Recommendations
 - Oysters must be grown from < 2.0 inches shell height
 - Oysters should be alive when removed

Verification & Documentation

Oyster Panel Recommendations for full credit calculations:

- Ploidy
- Type of aquaculture practice
- Reporting unit (Bushels, Individuals)
- Packaging type: Variable oyster sizes or uniform oyster sizes
- Central coordinates (Lat/Long) of initial & final grow-out location (if different)
- Month/year removed from final grow-out location
- Number of containers from final grow-out location
- Oyster count average for unit verification check
- Shell height average(s) for oyster size verification check
- Confirm Oysters are grown from <2" shell size

Current Reporting Options

- Option 1: Using current DNR form
 - Generates a default credit based on 2.25 inch diploid oyster
- Option 2: Separate MDE verification form
 - Generates an enhanced credit
 - Requires a legally responsible verifier

Calculating Credits (Example)

Number of individual oysters = 10,000 bushels multiplied by 132 oysters per bushel from unit verification check = 1.32 million oysters

Diploid estimates of 0.09 g N content and 0.01 g P content would be applied because the average from the shell height verification check was 3.3 inches falling into the 2.5-3.49 oyster size class. The total nitrogen and phosphorus removal would be calculated as follows using estimates from Table 7i:

Nitrogen (N)	g N Removed	
$1,320,000 \times 0.09 \text{ g N oyster}^{-1}$	118,800	
<hr/>	<hr/>	
Total	118,800	= 118.8 kg N removed
Phosphorus (P)	g P Removed	
$1,320,000 \times 0.01 \text{ g P oyster}^{-1}$	13,200	
<hr/>	<hr/>	
Total	13,200	= 13.2 kg P removed

Water Quality Credits Generated:

$118.8 \text{ kg N} \times 2.24 \text{ (lbs/kg)} = 262 \text{ lbs N removed or certifiable N credit}$

$13.2 \text{ kg P} \times 2.24 \text{ (lbs/kg)} = 29 \text{ lbs P removed or certifiable P credit}$

Example Verification Sheet

Table 9b. Example of reported verification information for on-bottom private oyster aquaculture when variable sized oysters are packaged together.

Oyster Count for Unit Verification Check			
Time Period	Date Measured	Container #	Oyster Count
Time Period 1	3/21/2016	1	98
		2	112
		3	120
		4	156
		5	150
		6	149
		7	160
		8	98
		9	101
		10	105
Time Period 2	9/22/2016	1	100
		2	110
		3	120
		4	125
		5	180
		6	155
		7	150
		8	150
		9	170
		10	145
Average			132
Average Shell Height for Oyster Size Class Verification Check			
Time Period	Date Measured	Container #	Average Shell Height (inches)*
Time Period 1	3/21/2016	1	3.25
		2	3.5
		3	3.5
		4	4.25
		5	3
		6	3.5
		7	2.5
		8	3.5
		9	3
		10	3.5
Time Period 2	9/22/2016	1	3
		2	3.5
		3	3.25
		4	3.5
		5	3
		6	3.5
		7	2.5
		8	3.5
		9	3.5
		10	3.75
Average (n = 100 oysters, 50 oysters per time period)			3.33

*Example shows the average of five random oysters per container. In practice, growers should report the measure for all oysters.

WQ Trading Nutrient/Sediment Credit Certification Process

Step 1

- Credit Generator to fill out sector specific form for certification
- Form is then emailed to Trading Admin acct.
- We'll need to set up some kind of auto email to let them know their submission was received.

Step 2

- MDE Trading personnel will input the data from the form into the WRI Registry
- Credit Certification process begins and MDE personnel reviews credit application for certification, if additional information is needed, then applicant is contacted

Step 3

- Credits are certified and a notification is sent to the applicant with instructions on how to put those credits on the marketplace, if they choose to do so
- If credits are not certified, a notification with explanation of the decision and appeals process will be sent to the applicant
- An excel, or Access, file will be used to track the paperwork and results initially as a back up

Step 4

- The credits are now available for purchase, the applicant will receive a range of Credit ID's for each pollutant type. (Either in Excel, or some other format)
- Instructions for registering sales/purchases of credits will be provided to the applicant
- Sales will be tracked in the Registry and at a macro scale in the Excel, or Access, file

Nutrient/Sediment Credit Trade Certification Process

Private Sales Agreement

2 or more parties will come to an agreement externally on the number and value of nutrient/sediment credits

Notification

Documentation of an agreement between two parties to sell/purchase credits will be provided to MDE for non Ag credits

Certification

MDE trading personnel will evaluate the sale to ensure it complies with regulation and determine whether to certify. Results are provided to all parties.

Registration

The certified results will be entered into the MDE Registry and available for public review. It will also be included in the MS Excel or Access tracker for redundancy.

The trading program will maintain a back-up tracker in MS Excel or Access for the 1st year as we refine the MDE Registry. This will allow us to maintain maximum certainty that credits generated and sold are being tracked. It will also be available as a layer of transparency for the public.

Additional Resources

Water Quality Trading Program Home



WQ TRADING
HOME

GENERATING
CREDITS

PURCHASING
CREDITS

REGISTRY
& MARKET

TOOLS
& RESOURCES

[MDE Water Quality Trading Program](#)

WQT Highlights:

- § NOTICE (1.23.19): Credit needs are being placed on the WQT Market Board, if you're a potential seller, please visit the Market Board under the "Registry & Market" to see if there is a potential partner in your watershed.