Mississippi MarketMaker Newsletter

THE GROWING U.S. CLAM AQUACULTURE INDUSTRY

ABSTRACT

- This presentation shows overall U.S. clam aquaculture production trends and farmgate values.
- U.S. aquaculture data are available from 1983 to 2019.
- Values beyond 2019 are predicted using econometric models developed by Dr. Posadas.

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U.S. CLAM FARMS

- More than 300 farms were growing various clam species in the U.S. (2018 Census of Aquaculture).
- Hard clams are farmed mainly in Florida, Virginia, New Jersey, Massachusetts, Connecticut, and other states.
- Geoduck and Manila clams are primarily farmed in Washington.

HARD CLAM OR NORTHERN QUAHOG

- Hard Clam/Northern Quahog. *Mercenaria mercenaria*. Also known as Hard clam, Quahog, Round clam, or Chowder clam.
- U.S. farmed hard clams are a smart seafood choice because they are sustainably grown and harvested under U.S. state and federal regulations.
- Farming Methods. Clams are grown in tidal areas. They can be grown directly on the beach bottom or in mesh bags, trays, or pens that are secured to the bottom.
- Region. New England/Mid-Atlantic, Southeast.
- Source: https://www.fisheries.noaa.gov/species/hard-clam-northern-quahog

GEODUCK

- Geoduck. *Panopea generosa.* Also known as King Clam, Elephant Clam, Gweduck, Goeduck, Goiduck.
- Geoduck is both a wild harvest and a growing geoduck aquaculture industry, particularly in Washington State. The majority of Washington's geoduck farming takes place in southern Puget Sound.
- Farming Methods. Geoducks are planted in PVC pipes on intertidal beaches until they are large enough to burrow into the sediment.
- Region. Alaska, West Coast.
- Source: https://www.fisheries.noaa.gov/species/geoduck.

LET US START OUR MODELING EFFORT!

- The NOAA Fisheries data on national aquaculture production are reported in **pounds per year**.
- The NOAA Fisheries data on national aquaculture farmgate values are reported in **dollars per year**.
- The national farmgate prices are imputed from the farmgate values and pounds of meat.
- U.S. aquaculture data are available from **1983 to 2019**.
- Values beyond 2019 are predicted using econometric models developed by Dr. Posadas.

U.S. AQUACULTURE ECONOMIC MODELS

- The Ordinary Least Squares (OLS) models of U.S. aquaculture consisted of the following dependent variables:
    - Aquaculture production (lb/yr)
    - Deflated farmgate value ($/yr)
- The OLS models of U.S. aquaculture were estimated using the robust variance procedure of STATA-16.
- The variation inflation factor was calculated to detect the possible presence of multicollinearity.
- The marginal impacts of disaster events were computed using the margins procedure.

U.S AQUACULTURE PRODUCTION ECONOMIC MODEL

- The OLS model of U.S aquaculture production (lb/yr) assumed that annual production could be explained by the following:
    - year and year-squared
    - recession (1 or 0)
    - growth in per capita disposable income (%)
    - other variables

U.S AQUACULTURE FARMGATE VALUE ECONOMIC MODEL

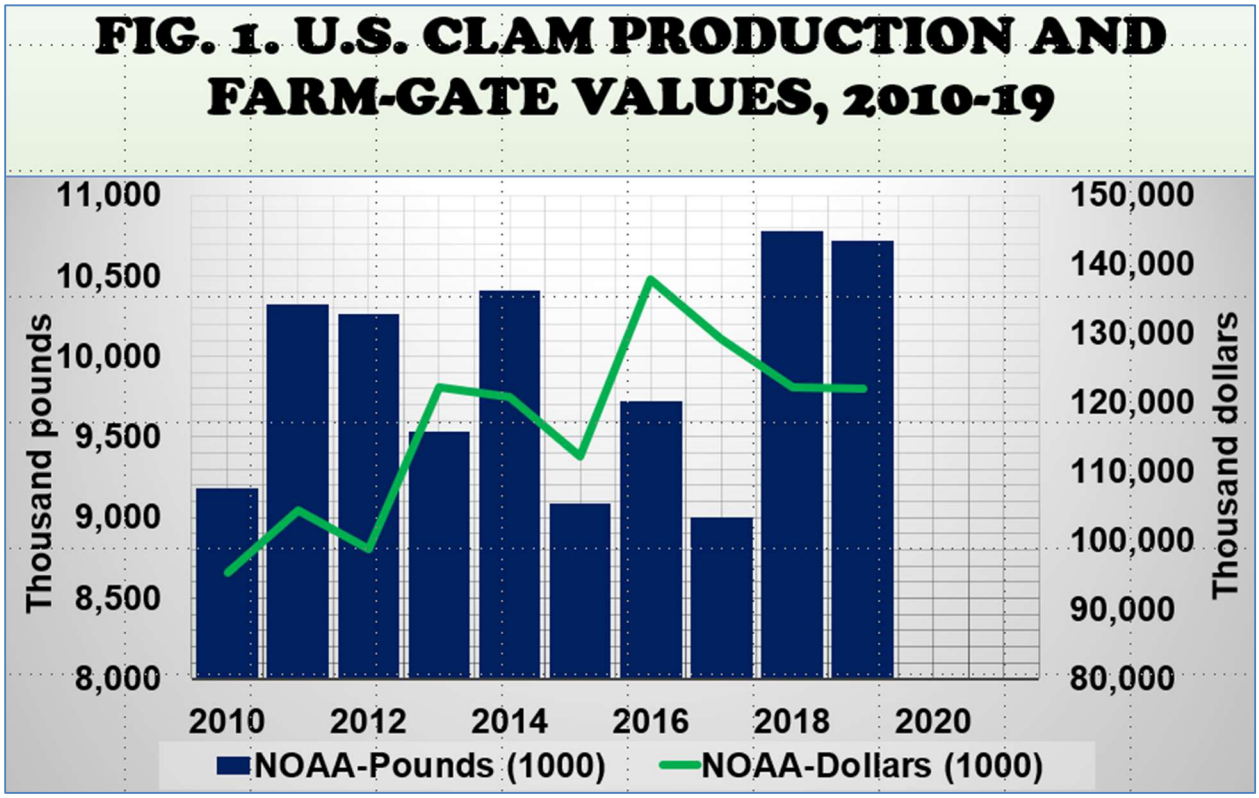
- The OLS model of U.S. aquaculture farmgate value ($/yr) assumed that annual production could be explained by the following:
    - year and year-squared
    - recession (1 or 0)
- aquaculture production (lb/yr)
- growth in per capita disposable income (%)
- other variables

U.S. CLAM AQUACULTURE, 2010-19

- Production (lb/yr)
- Farm-gate values ($/yr)
- Imputed farmgate prices ($/lb)
- Data were compiled from NOAA Fisheries website and reports.

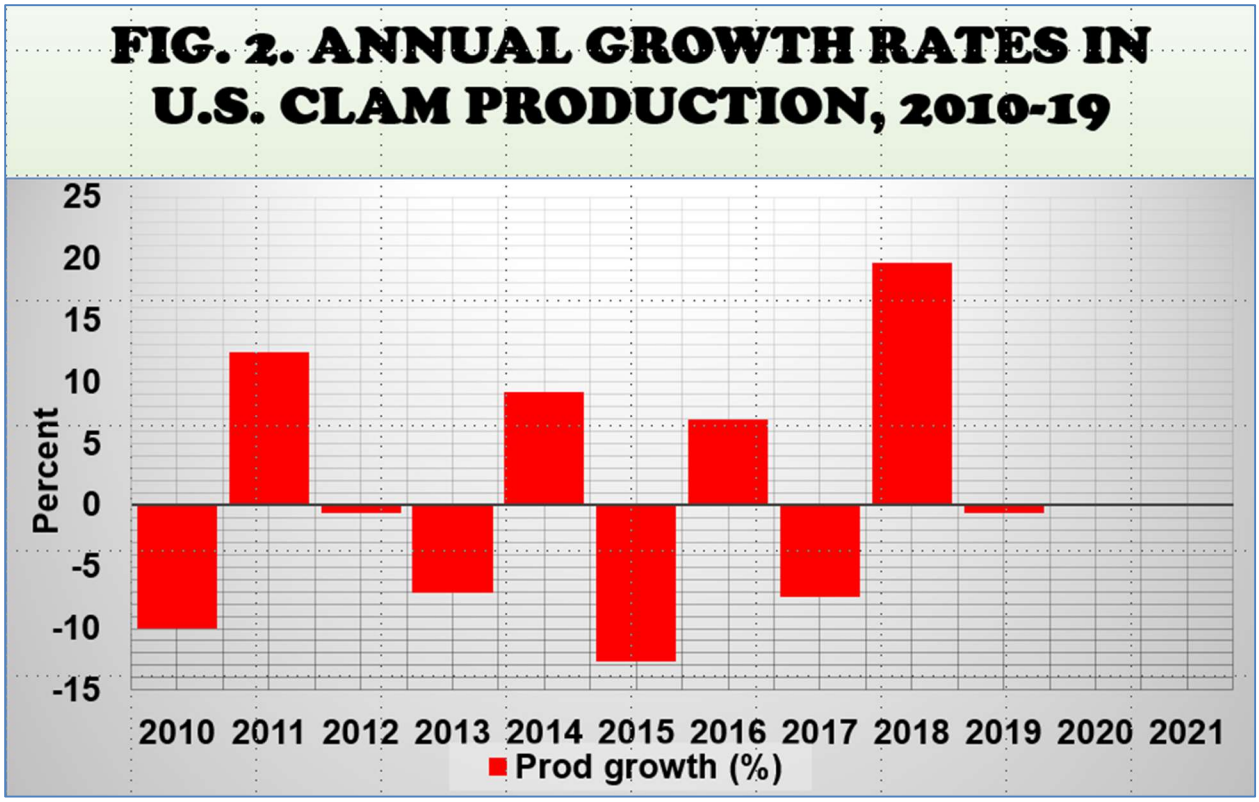
U.S. CLAM PRODUCTION AND FARMGATE VALUES, 2010-19

- As reported by NOAA Fisheries, NOAA-Pounds (1000) is the annual clam production in pounds.
- NOAA-Dollars (1000) is the annual clam farmgate values in dollars as reported by NOAA Fisheries.
- Annual production since 2014 averaged 9.95 million pounds (Fig. 1).
- Annual farmgate value since 2014 averaged $123.9 million (Fig. 1).



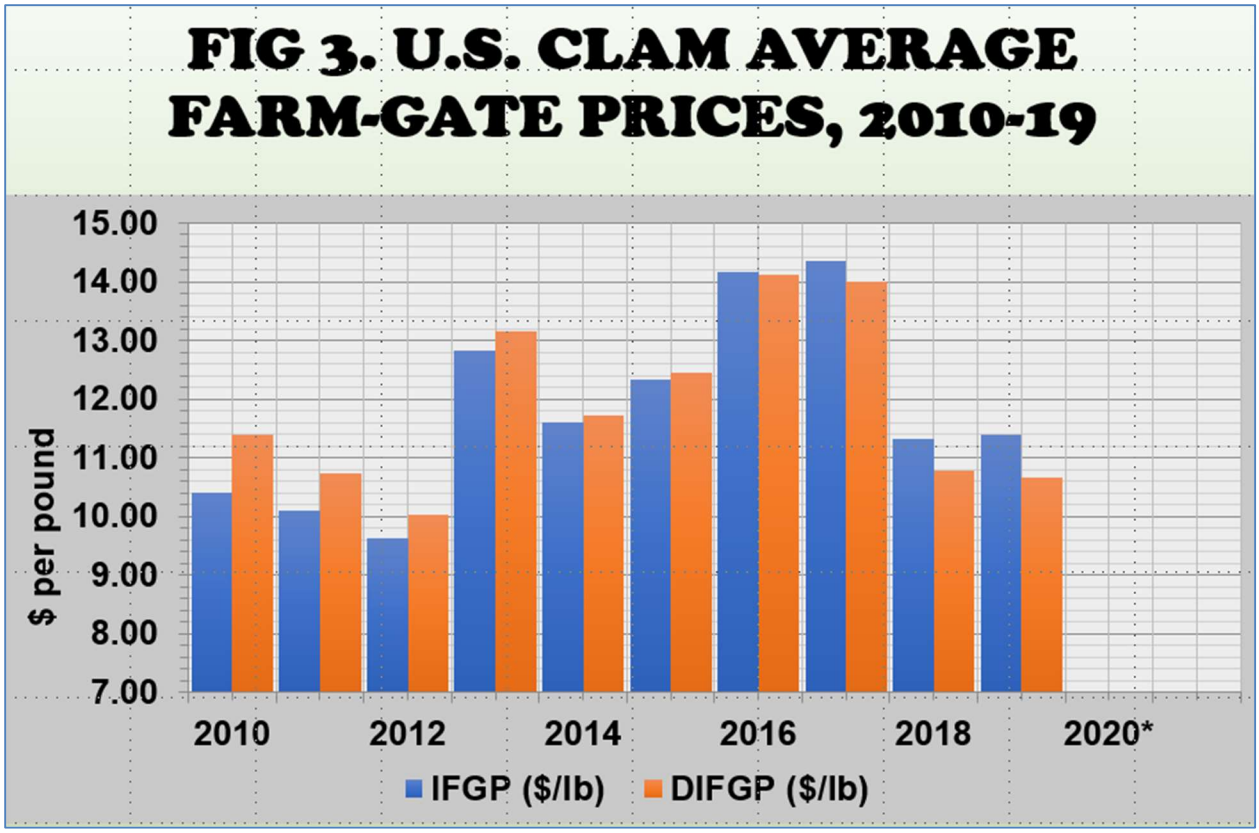
ANNUAL GROWTH RATES IN U.S. CLAM PRODUCTION, 2010-19

- Production growth is the annual growth rate in yearly clam production in percent.
- The annual production growth rate since 2014 averaged 2.53 percent (Fig. 2).
- The Annual deflated farmgate value growth rate since 2014 averaged -1.07 percent.



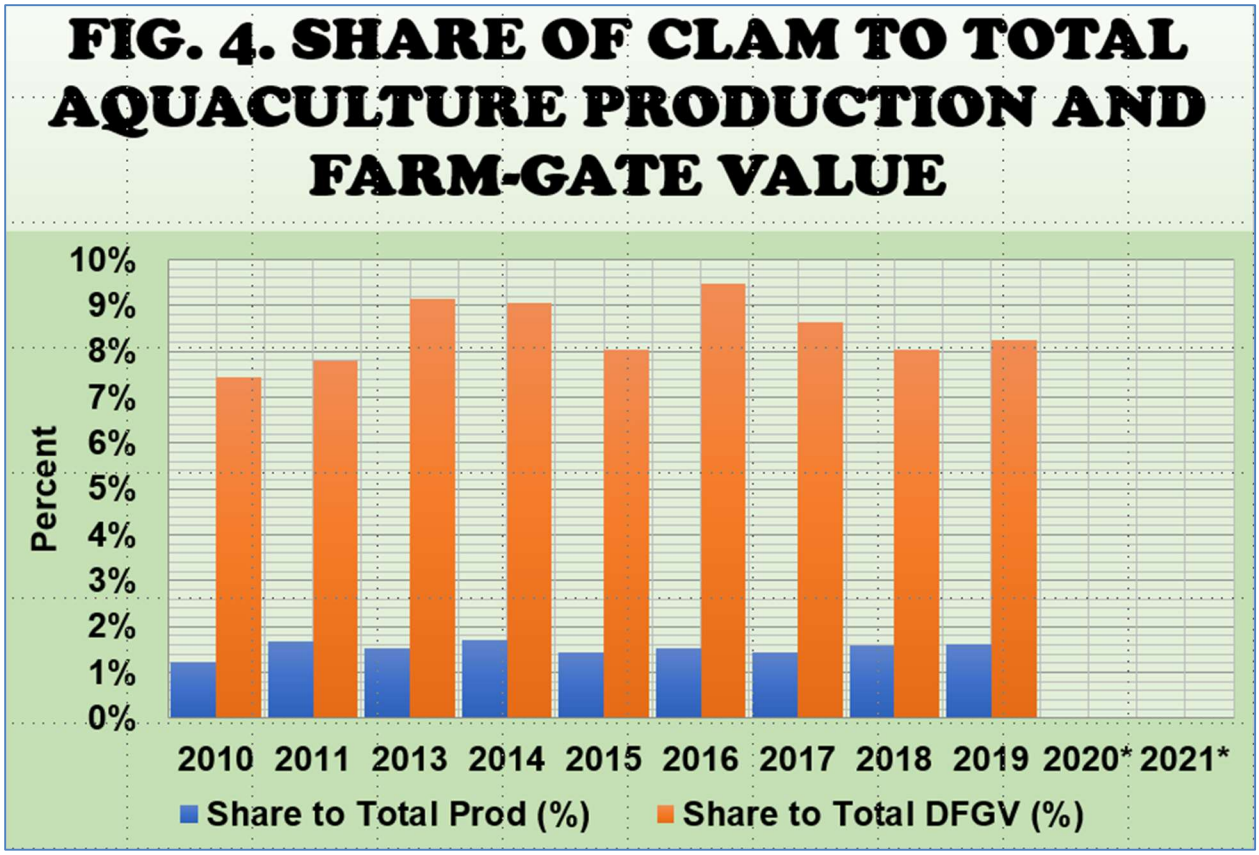
U.S. CLAM AVERAGE FARMGATE PRICES, 2010-19

- Wholesale clam prices are reported by Urner Barry Comtell in dollars per bushel.
- The imputed farmgate price (IFGP) is expressed in dollars per pound.
- The deflated imputed farmgate price (DIFGP) is IFGP divided by the consumer price index (Fig. 3).
- The imputed farmgate price (IFGP) since 2014 averaged $12.53 per pound.



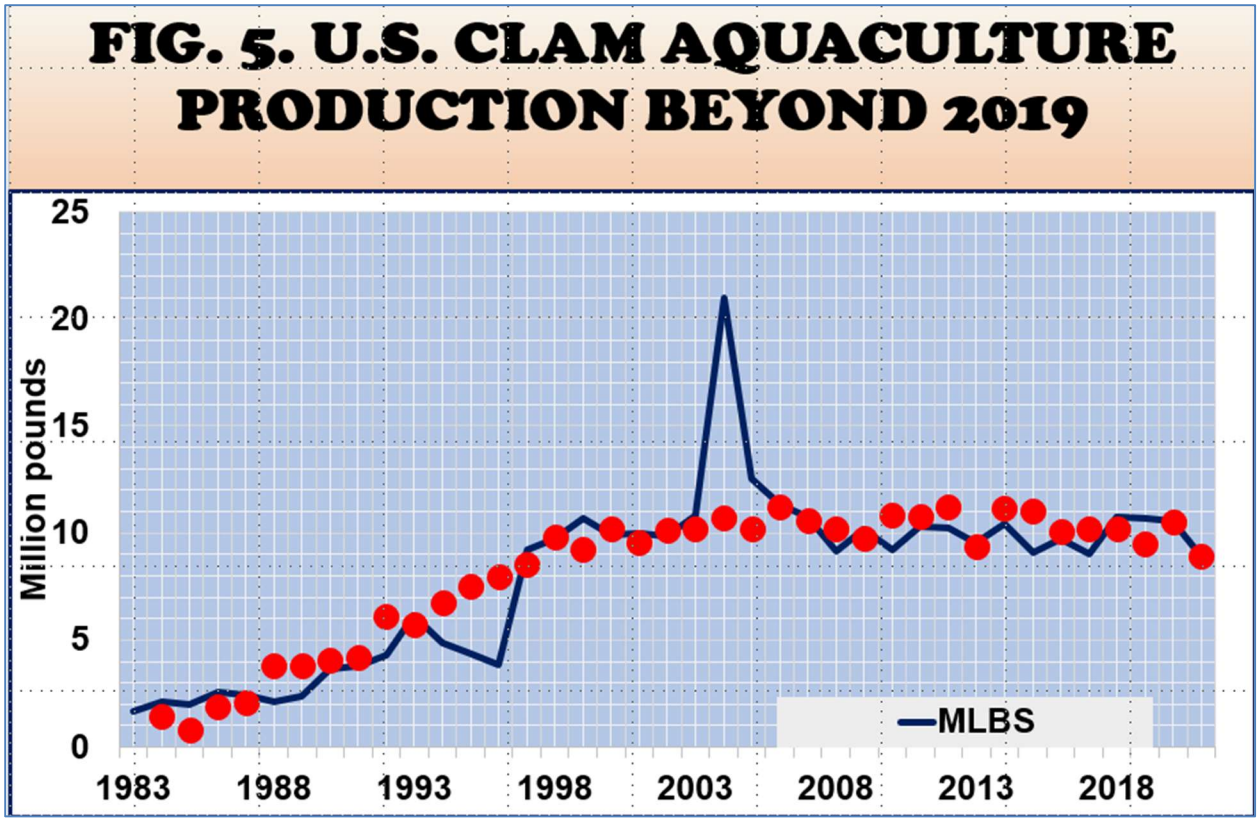
SHARE OF CLAM TO TOTAL AQUACULTURE PRODUCTION AND FARMGATE VALUE

- Share to total is the percent contribution of clam production or farmgate value to total U.S. aquaculture production or farmgate value.
- Share to total U.S. aquaculture production of clam production since 2014 averaged 1.6 percent (Fig. 4).
- Share to total U.S. farmgate value of clam aquaculture since 2014 averaged 8.6 percent (Fig. 4).



U.S. CLAM AQUACULTURE, 1983 TO 2021

- Production (lb/yr)
- Farm-gate values ($/yr)
- Imputed farmgate prices ($/lb)
- Data from 1983 to 2019 were compiled from the NOAA Fisheries website and reports (Fig. 5 & 6).
- Values from 2020 to 2021 were predicted using econometric models developed by Dr. Posadas (Fig. 5 & 6).

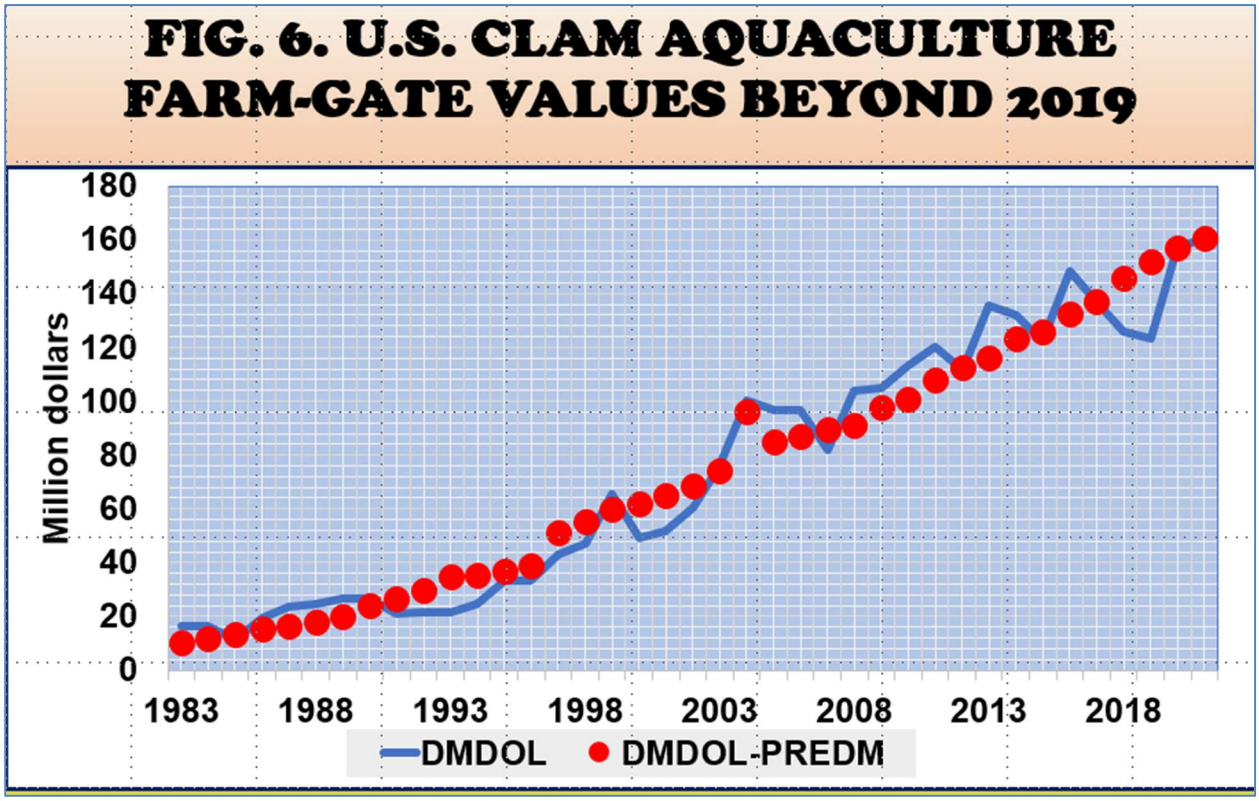


U.S. CLAM AQUACULTURE PRODUCTION BEYOND 2019

- The estimated OLS equation of clam aquaculture production explained 72 percent of the variations in annual clam production.
- Time is a significant determinant of annual clam production.
- Recession is a negative but not significant determinant of annual clam production.
- The growth in per capita disposable income is a positive and significant determinant of annual clam production.

U.S. CLAM AQUACULTURE FARMGATE VALUES BEYOND 2019

- The estimated OLS equation of clam aquaculture production explained 94 percent of the variations in annual clam farmgate values.
- Time is a significant determinant of annual clam farmgate values.
- Recession is a negative but not significant determinant of annual clam farmgate values.
- Annual clam production is a positive and significant determinant of annual clam farmgate values.



MARGINAL IMPACTS OF RECESSIONS

- Recessions caused clam production to fall by an average of -0.19 million pounds per year, and
- Deflated farmgate values to decline by an average of -$0.58 million per year.

SUMMARY AND IMPLICATIONS

- Why is annual clam production predicted to be lower in 2020 and 2021?
- In 2020, the global pandemic created disruptions in the marketplace and production space.
- Recessions disrupted domestic production and markets of farmed clams.

MY ECONOMIC OUTREACH ON CLAMS

- Posadas, B.C. 2022a. The Growing U.S. Clam Aquaculture Industry. HME Outreach. MSU-CREC, Biloxi, MS. Virtual presentation. **https://www.youtube.com/user/bposadas**

- Posadas, B.C. 2022b. U.S Processing Production of Clam Products. HME Outreach. MSU-CREC, Biloxi, MS. Virtual presentation. **https://www.youtube.com/user/bposadas**

- Posadas, B.C. 2022c. The Growing U.S. Clam Aquaculture Industry. Mississippi MarketMaker Newsletter, Vol. 12, No. 11. November 15, 2022. http://extension.msstate.edu/newsletters/mississippi-marketmaker.

- Posadas, B.C. 2022d. U.S Supply of Clam Products. HME Outreach. MSU-CREC, Biloxi, MS. Virtual presentation. **https://www.youtube.com/user/bposadas**