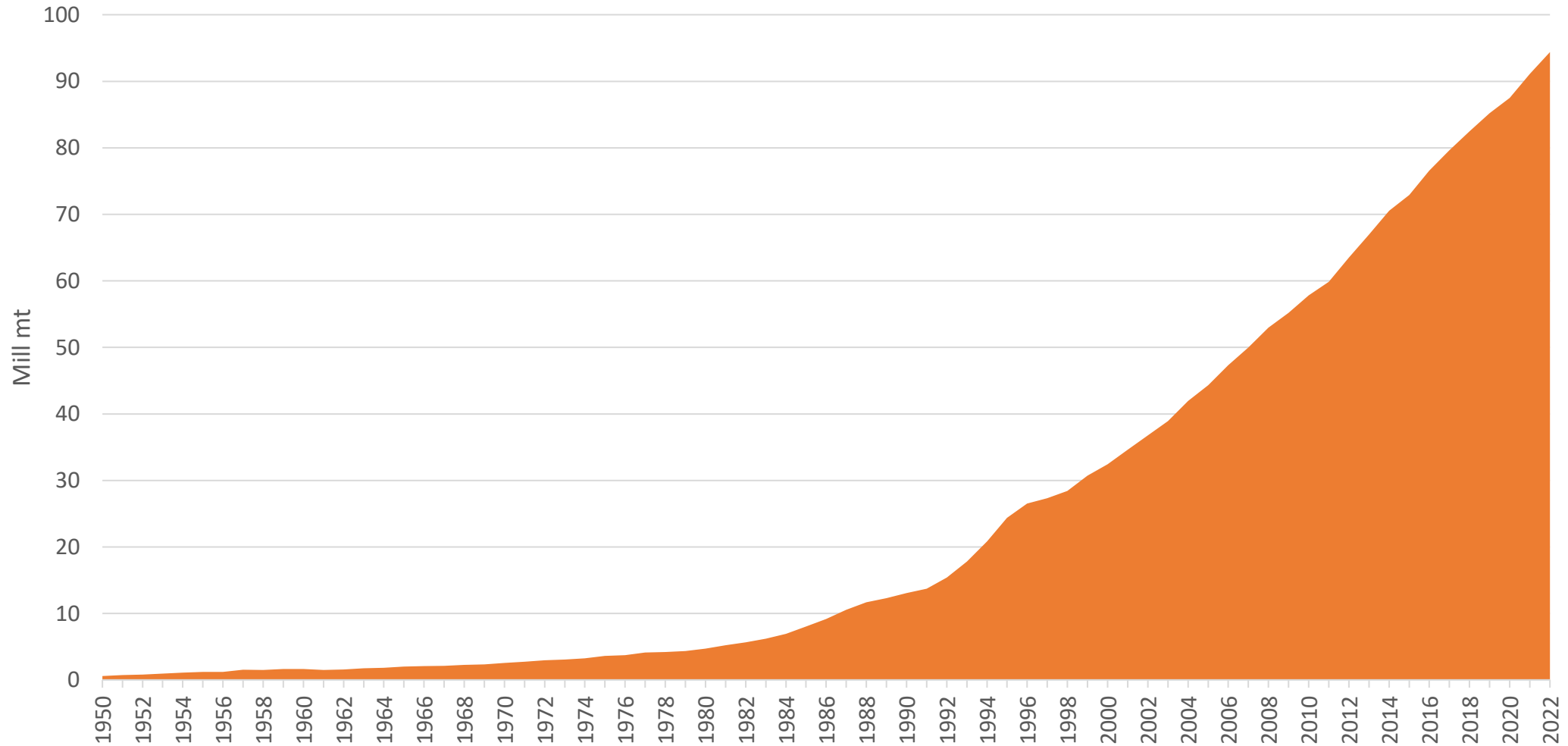


# Shrimp Aquaculture: Opportunities and Challenges

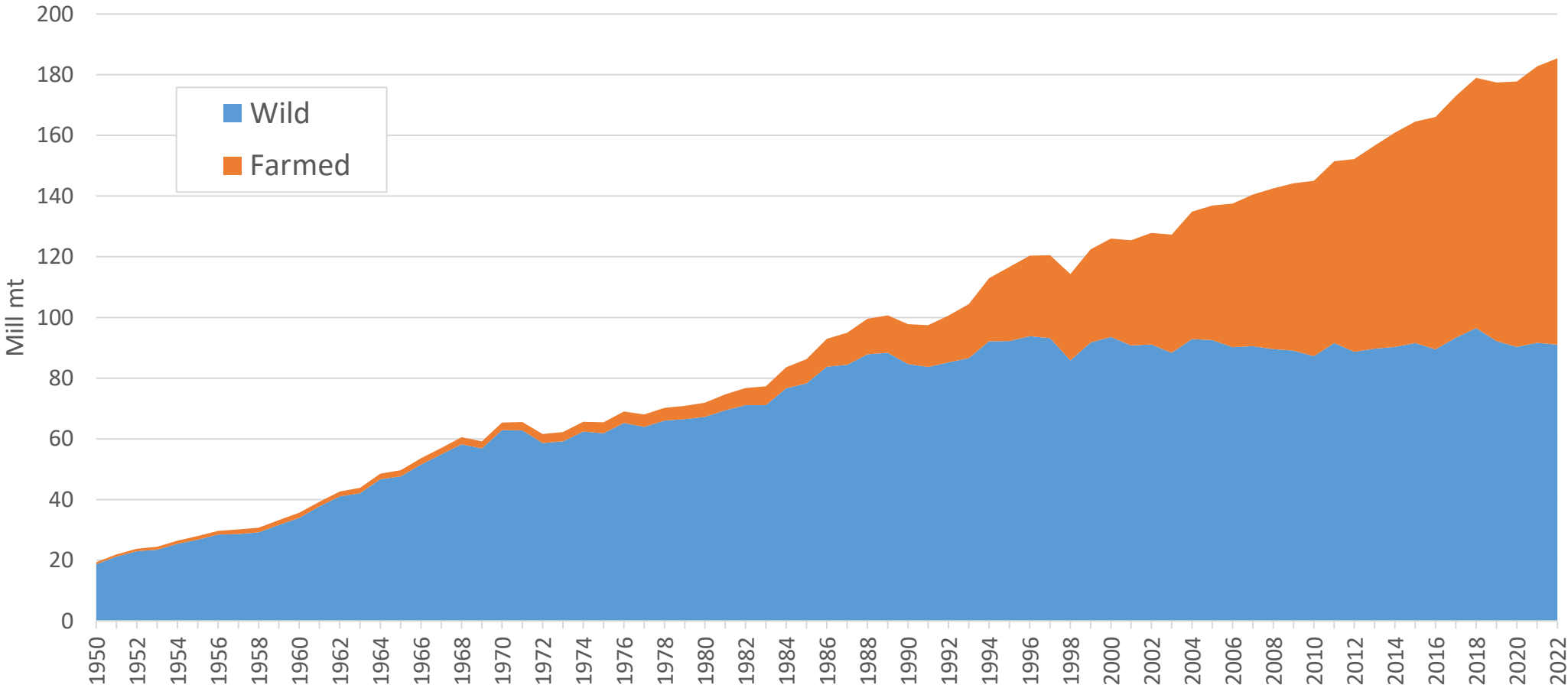
Frank Asche

Florida Shrimp Aquaculture Summit,  
May 16, 2024

# AQUACULTURE IS A GLOBAL SUCCESS STORY: GLOBAL AQUACULTURE PRODUCTION, 1950-2022

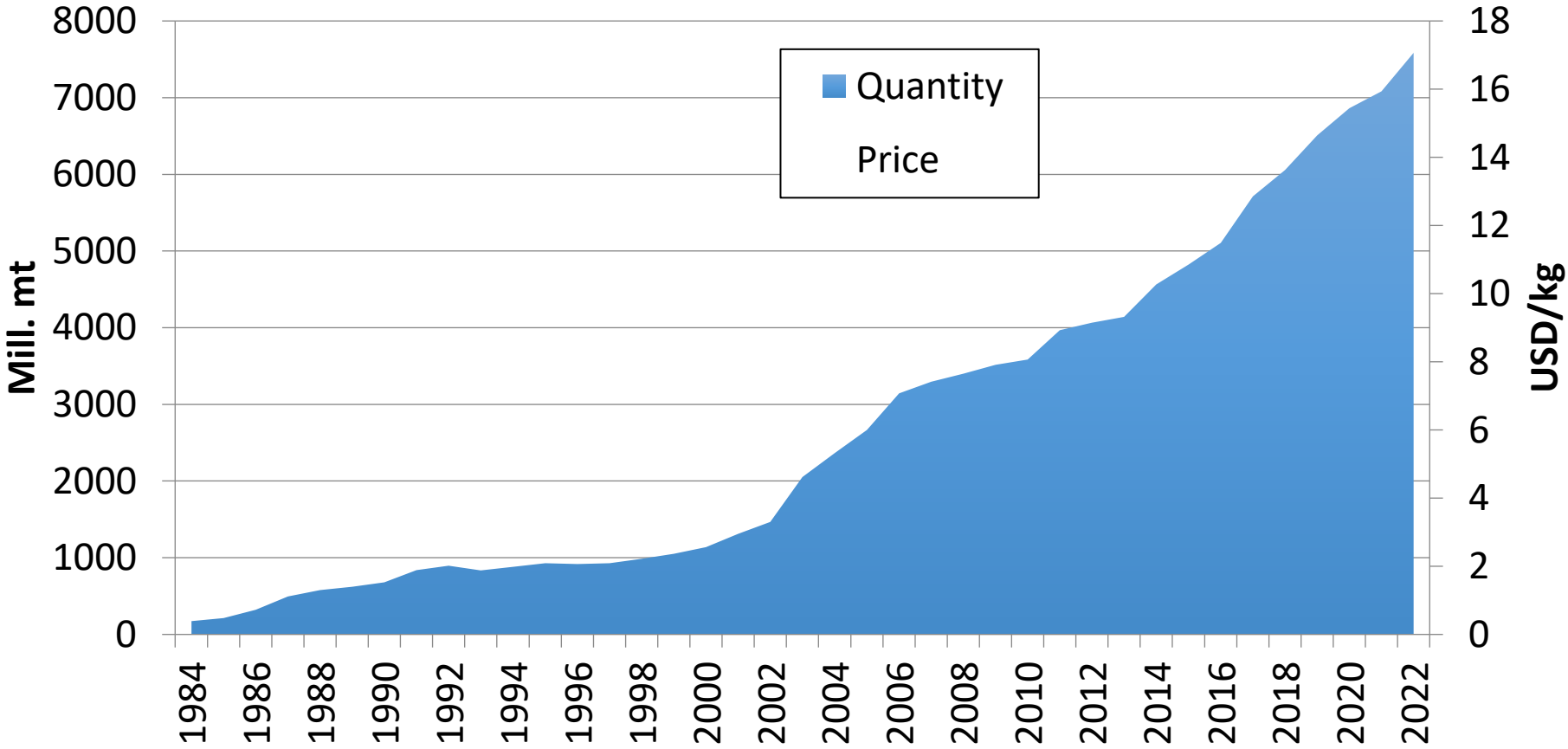


# GLOBAL SEAFOOD PRODUCTION BY TECHNOLOGY: ONLY BECAUSE OF AQUACULTURE, SEAFOOD SUPPLY CONTINUES TO INCREASE



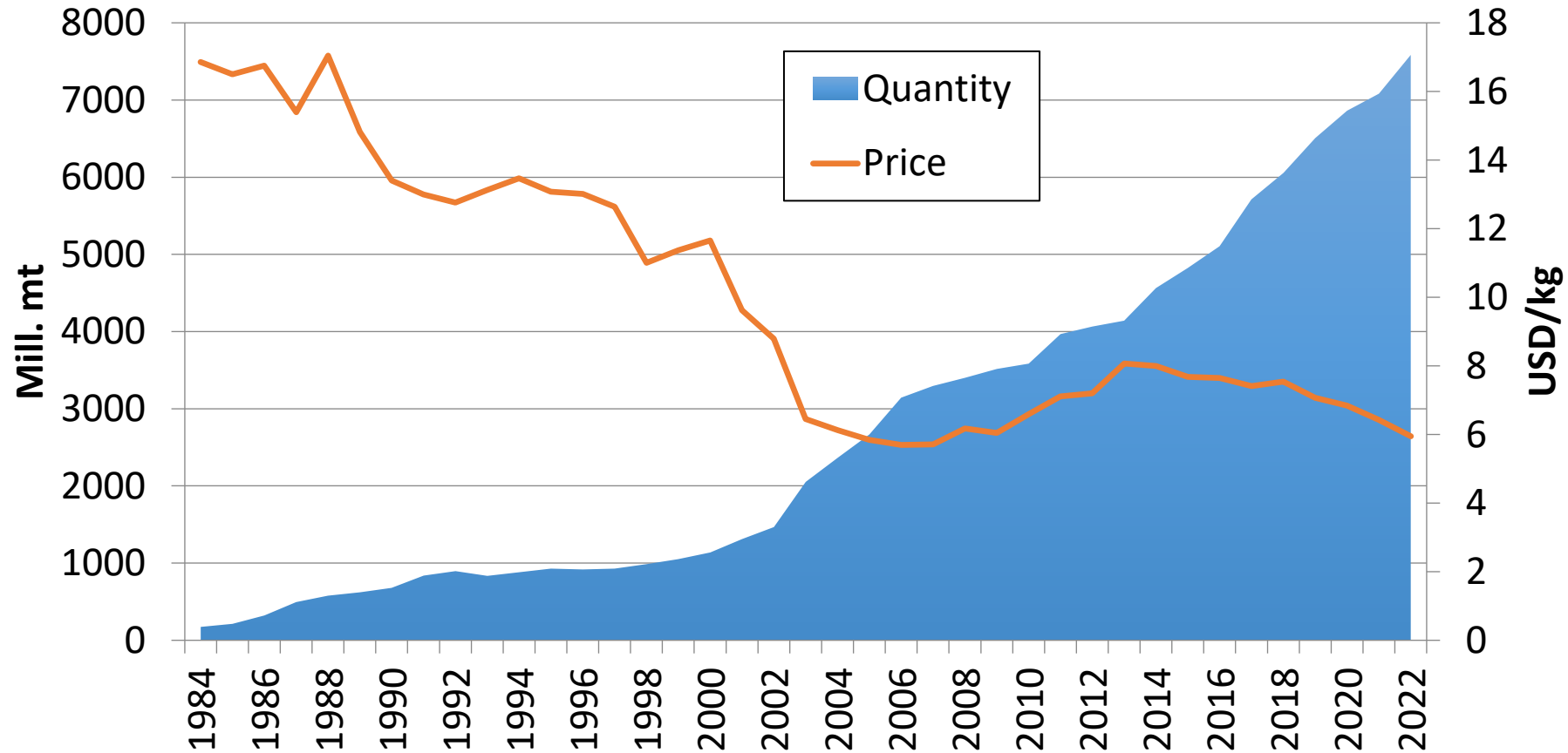
Source: FAO

# SHRIMP IS THE LARGEST AQUACULTURE SPECIES BY VALUE AND GLOBAL FARMED SHRIMP PRODUCTION HAS BEEN GROWING EVEN FASTER THAN AQUACULTURE OVERALL IN RECENT DECADES



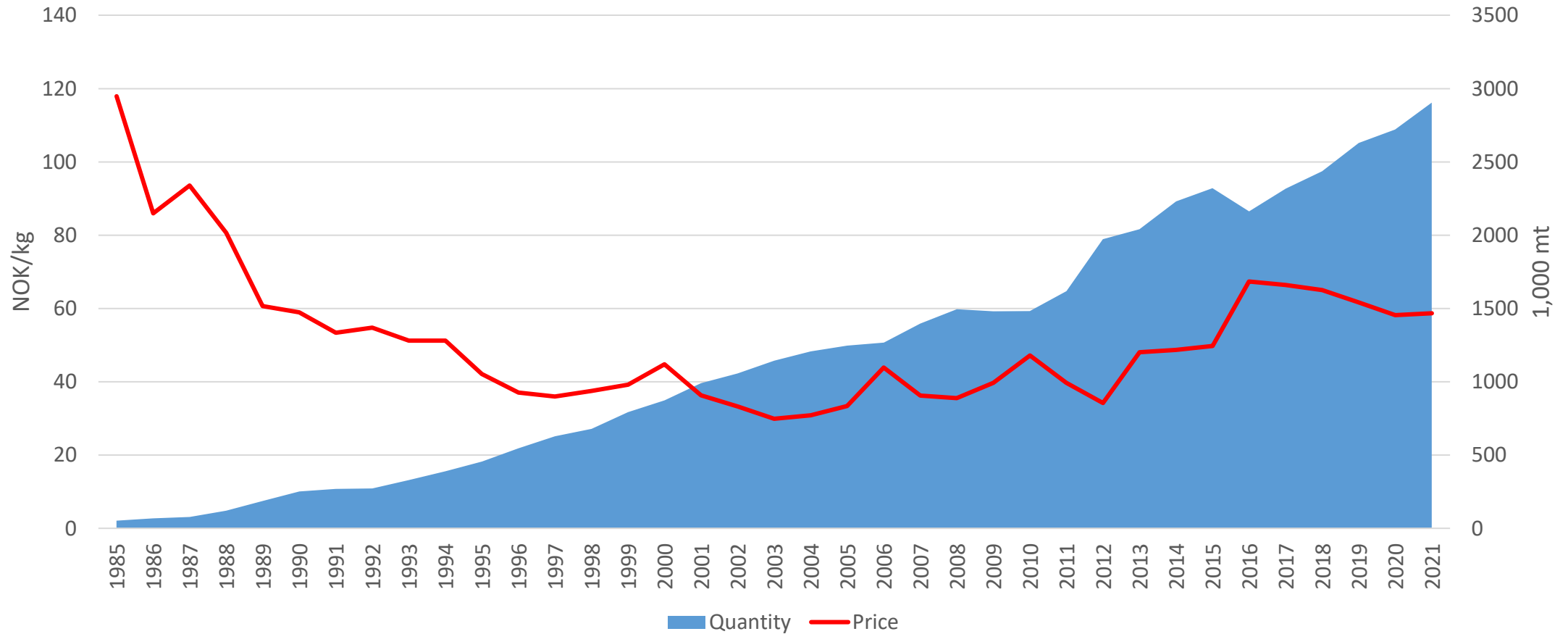
Source: FAO

# GLOBAL AQUACULTURE PRODUCTION OF SHRIMP AND REAL PRICE (2022=1) THE THREE MOST IMPORTANT DRIVERS SHAPING THE GROWTH ARE STRONG DEMAND, IMPROVED PRODUCTION AND DISEASE

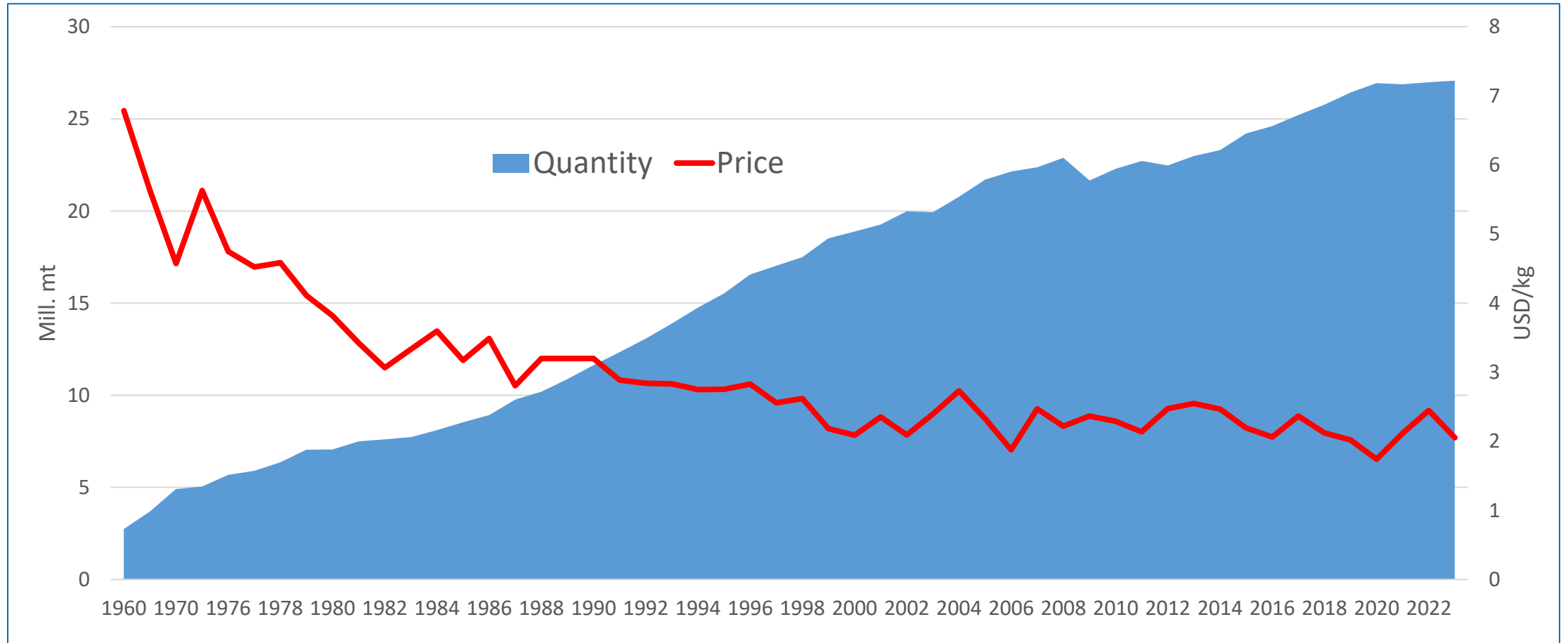


Source: FAO

# THE STORY IS LARGELY THE SAME FOR SALMON...



# ...AND FOR U.S. CHICKEN PRODUCTION AND REAL WHOLESALE PRICE (2023=1)



# SUCCESSFUL SPECIES ARE PROFITABLE

- Production of any good increase only because it is profitable
  - Profitability is the market's signal that it want more of a product
- For production to be increasing over longer periods of time, innovation and new technologies have to bring down production cost
- Increased supply in general reduce price
  - This is the strongest inducement to attract more consumers, but also more processors that creates new product and thereby increase demand
- And increased demand caused by product development and new market channels is very helpful for further growth





# BUT COMPETITION IS STILL KEEN

- If you are successful, you will be copied
- That is true for the production process, the supply chains and the markets being served
  - Producers that cannot keep up with the frontier struggle
- New technologies and markets are accordingly both opportunities and challenges
  - And governance systems that prevents new technologies being used are real hurdles

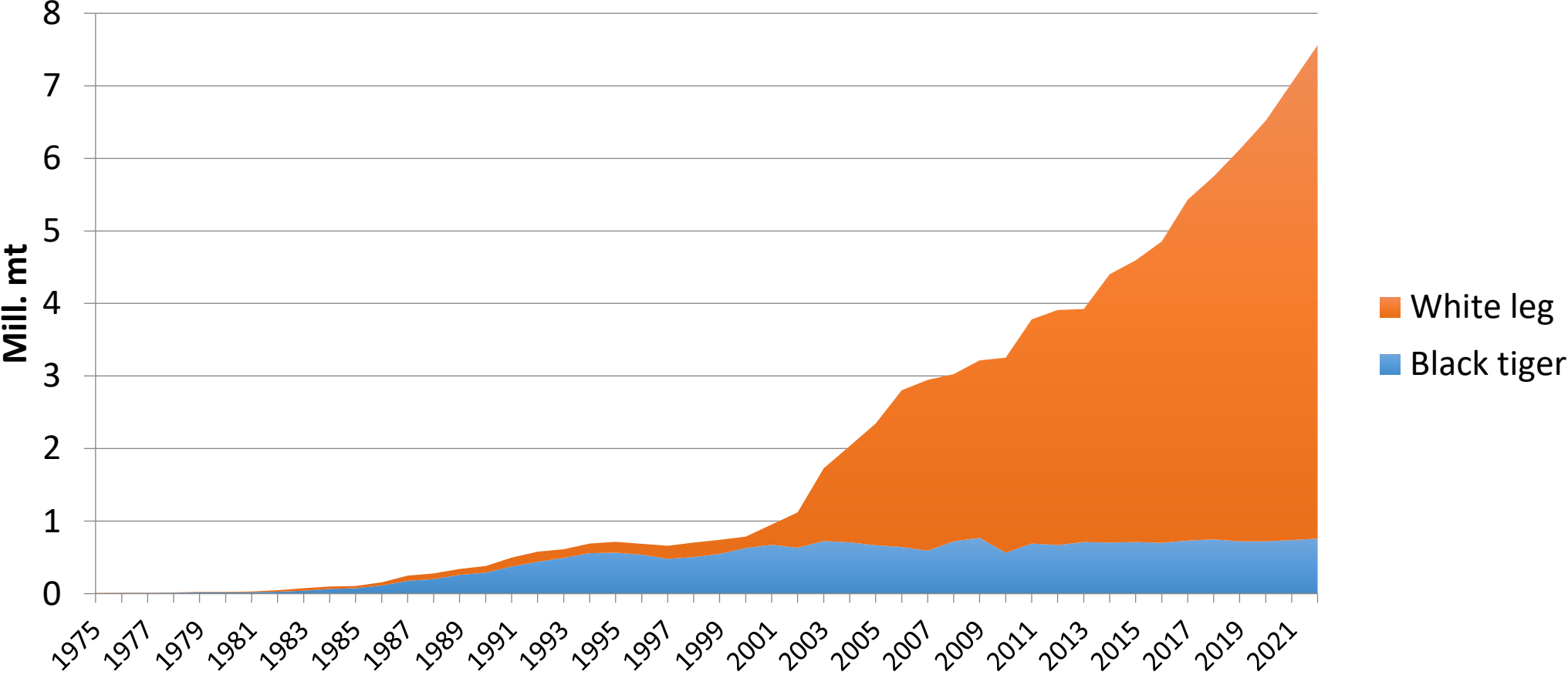


# BIOLOGICAL PRODUCTION PROCESSES ARE ALSO RISKY, AND ONE MUST BE ABLE TO HANDLE THAT RISK

- That is definitely true for shrimp
- Disease is probably the number one risk globally
- Leads to significant price variation, but also innovation
  
- The riskiness is also dependent on governance system
  - In many developing countries there is too little
  - In U.S. aquaculture there may be too much
    - But FDACS is relatively business friendly

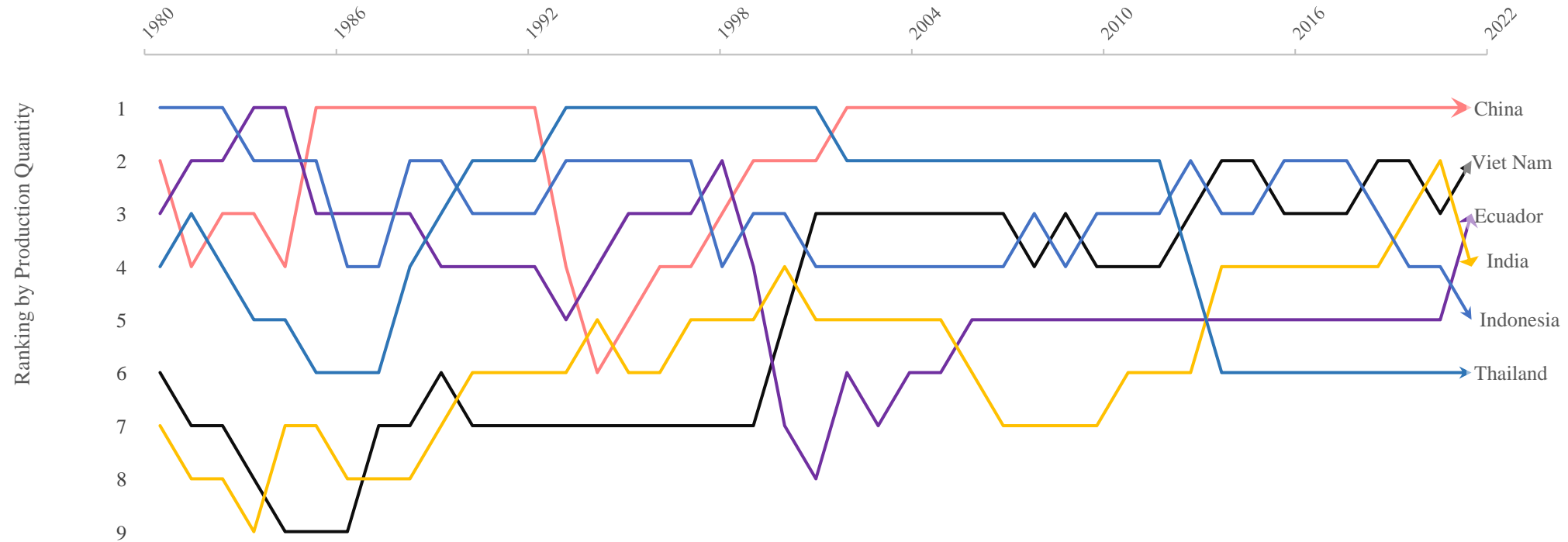


# GLOBAL FARMED SHRIMP PRODUCTION: BLACK TIGER TO VANNAMEI, DISEASE AND BREEDING CHANGED THE NO. 1 SPECIES



Source: FAO

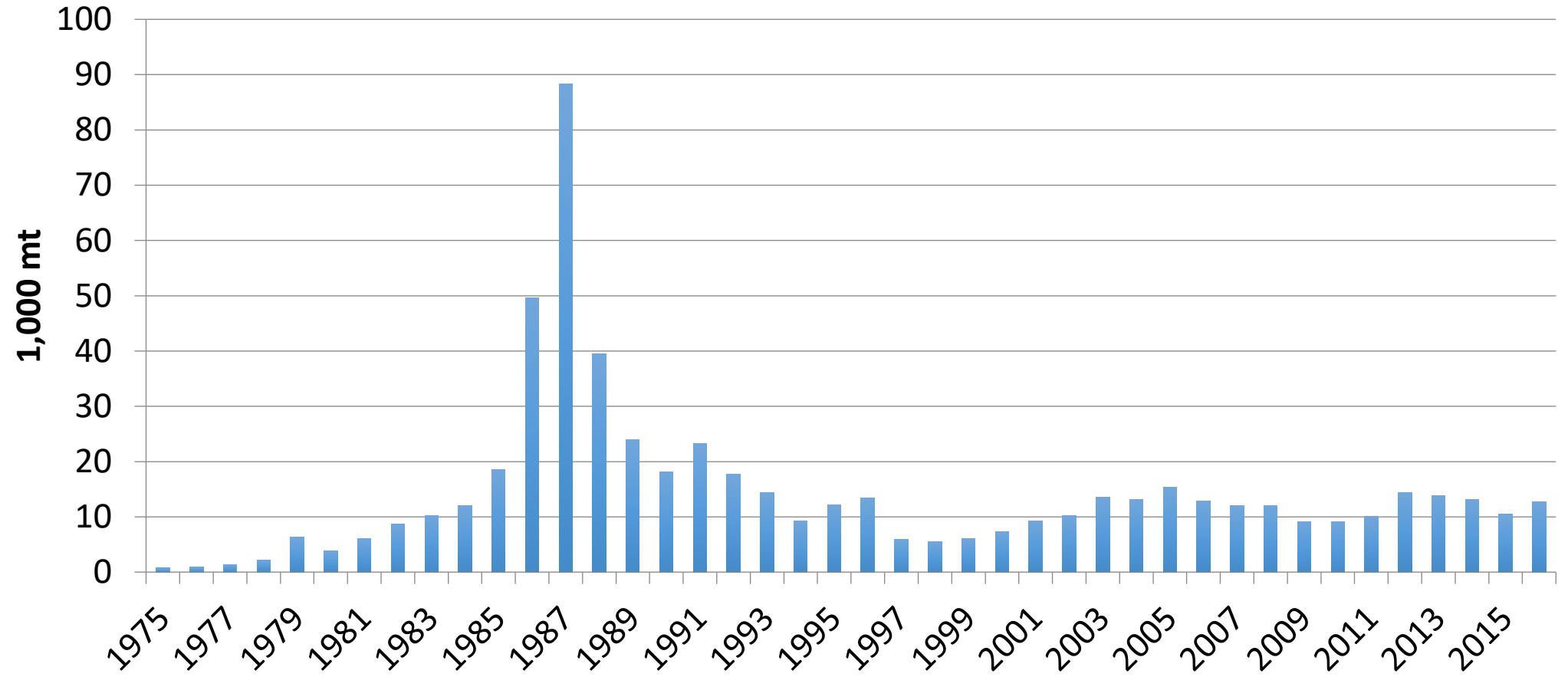
# TOP 6 SHRIMP PRODUCING COUNTRIES: WHERE PRODUCTION TAKES PLACE IS ALSO A DISEASE HANDLING TOOL



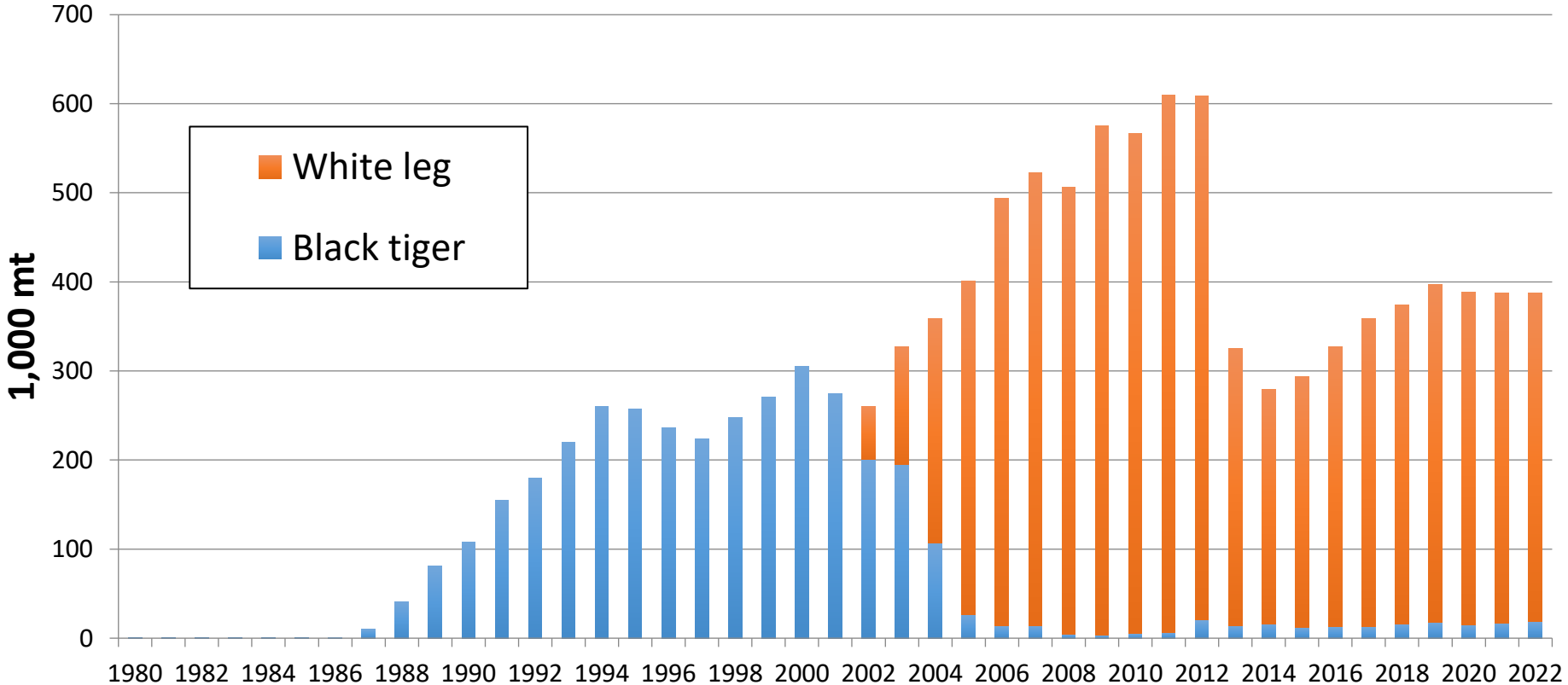
Source: FAO



# DISEASE, TOGETHER WITH POOR GOVERNANCE THREATENS SUSTAINABILITY - SHRIMP PRODUCTION, TAIWAN

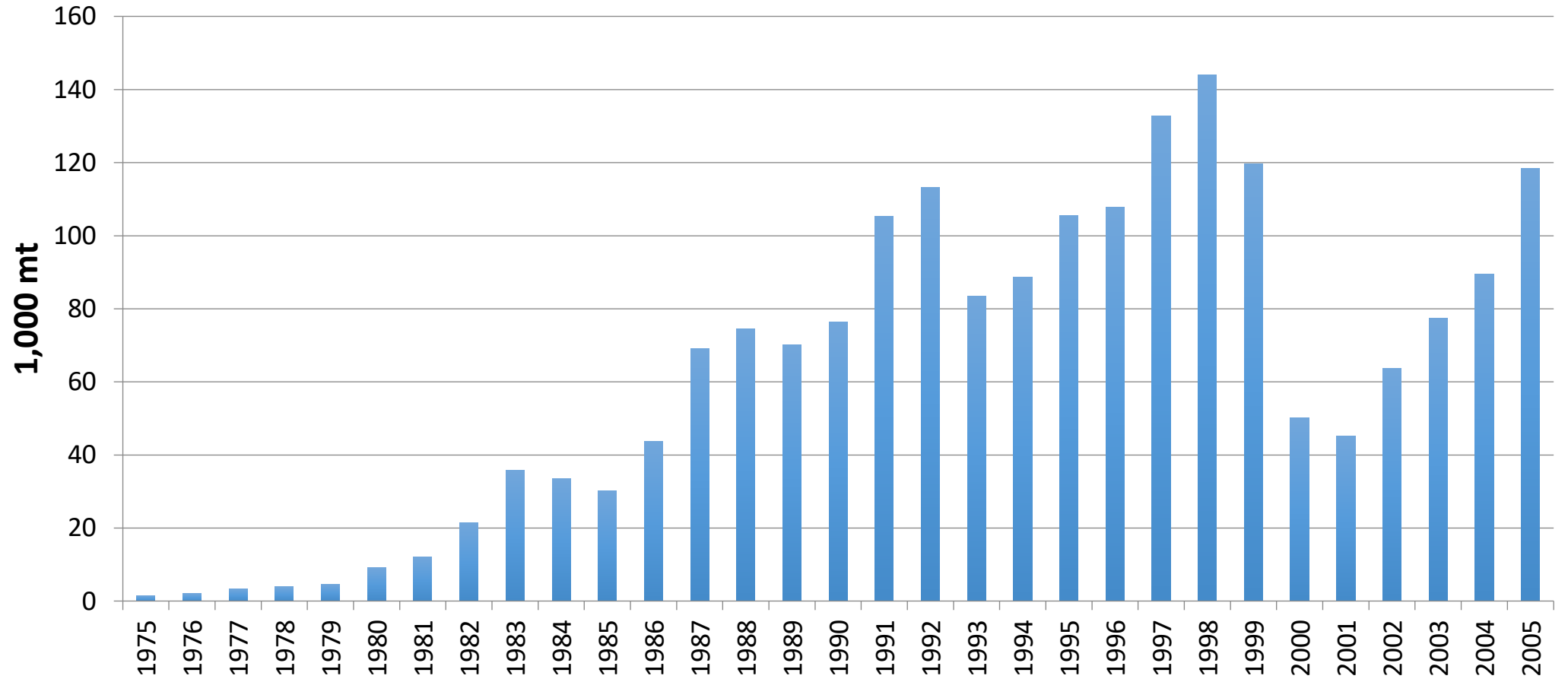


# NEW SUPRISSES MAY WAIT AROUND THE CORNER WHEN ONE HAVE SOLVED ONE CHALLENGE – SHRIMP PRODUCTION IN THAILAND



Source: FAO

# IF ONE LEARN TO HANDLE THE DISEASE IN TIME, AN INDUSTRY CAN REBOUND – SHRIMP PRODUCTION IN EQUADOR, 1975-2005



Source: FAO



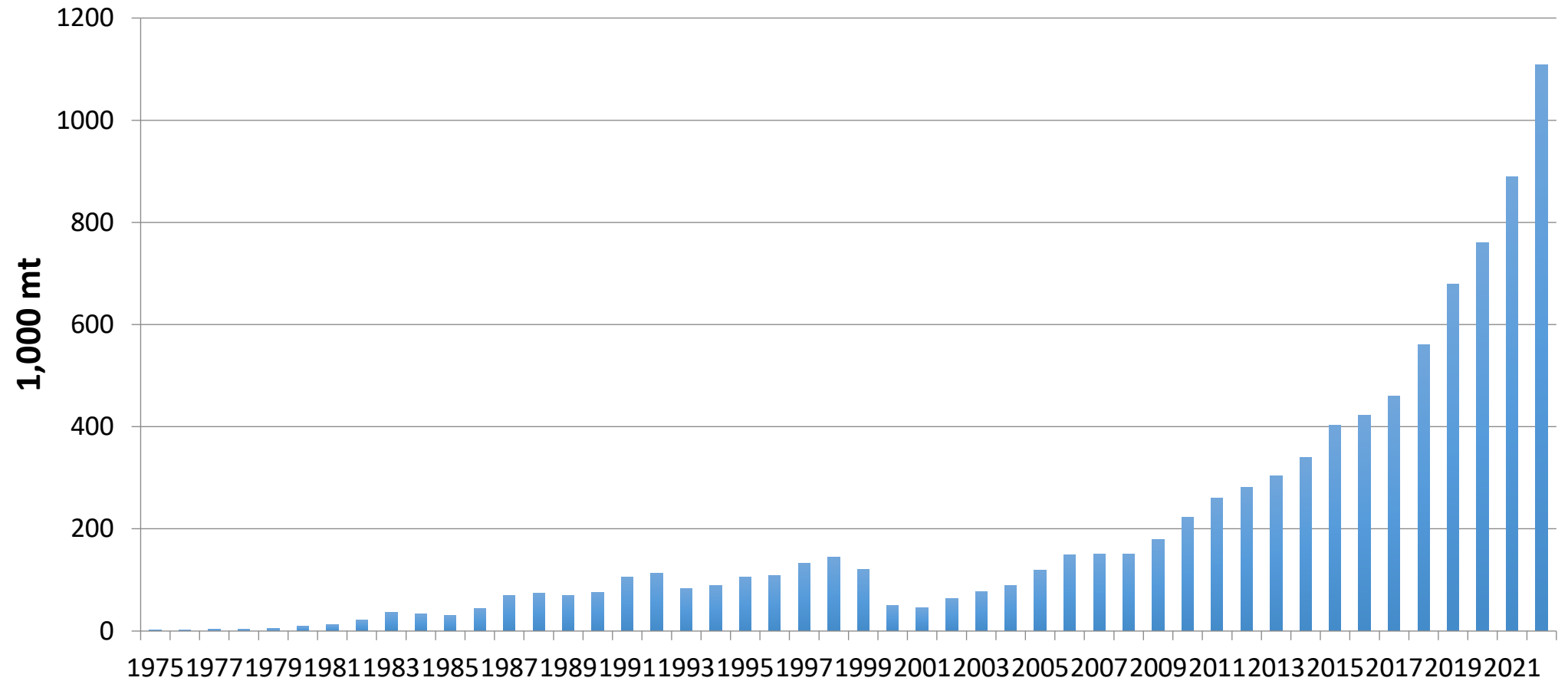
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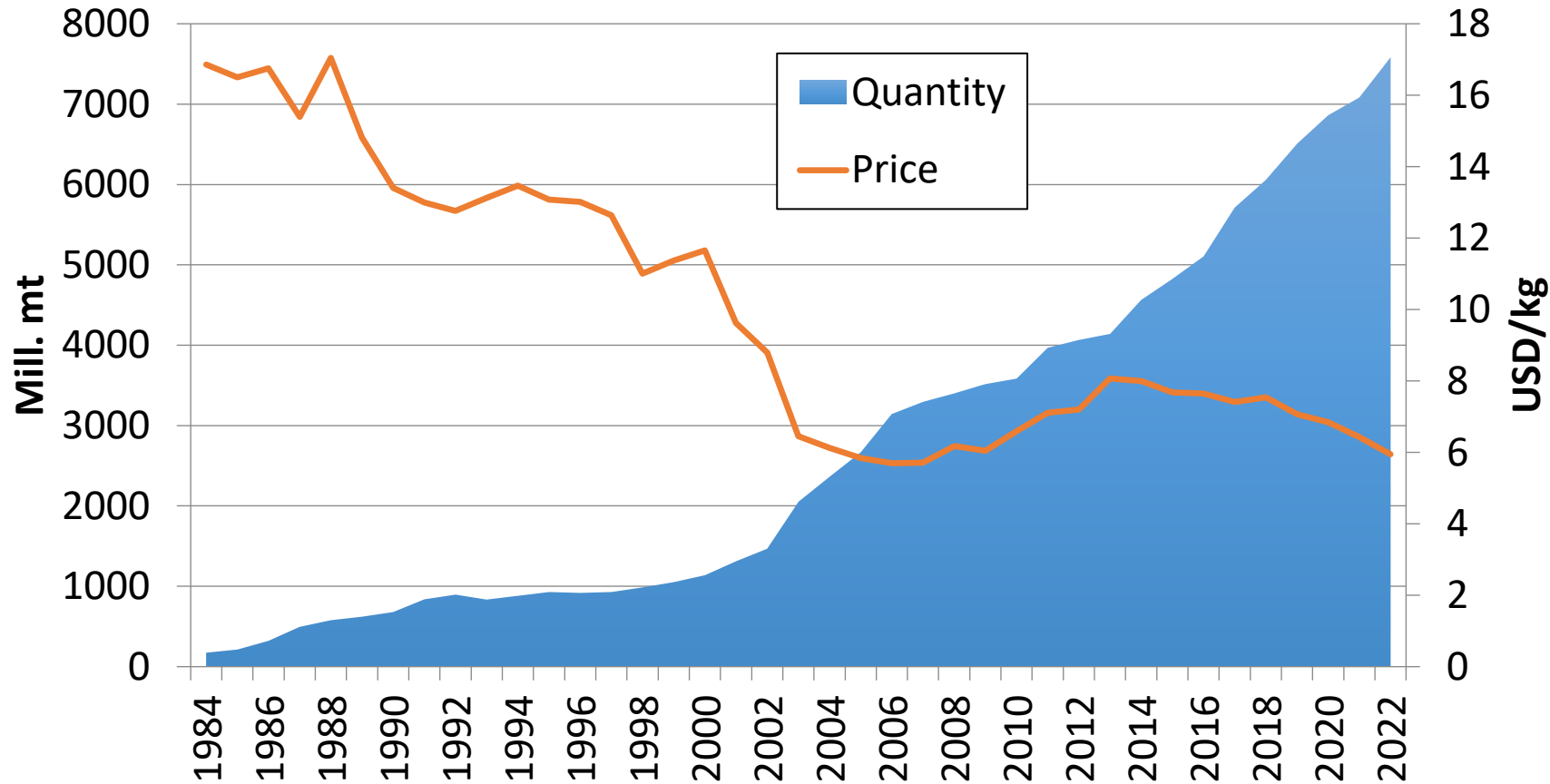
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# IF ONE LEARN TO HANDLE THE DISEASE IN TIME, AN INDUSTRY CAN REBOUND – SHRIMP PRODUCTION IN EQUADOR, 1975-2022





# GLOBAL AQUACULTURE PRODUCTION OF SHRIMP AND REAL PRICE (2022=1) THE PRICE HAS BEEN COMING DOWN, AND WILL CONTINUE TO DO SO



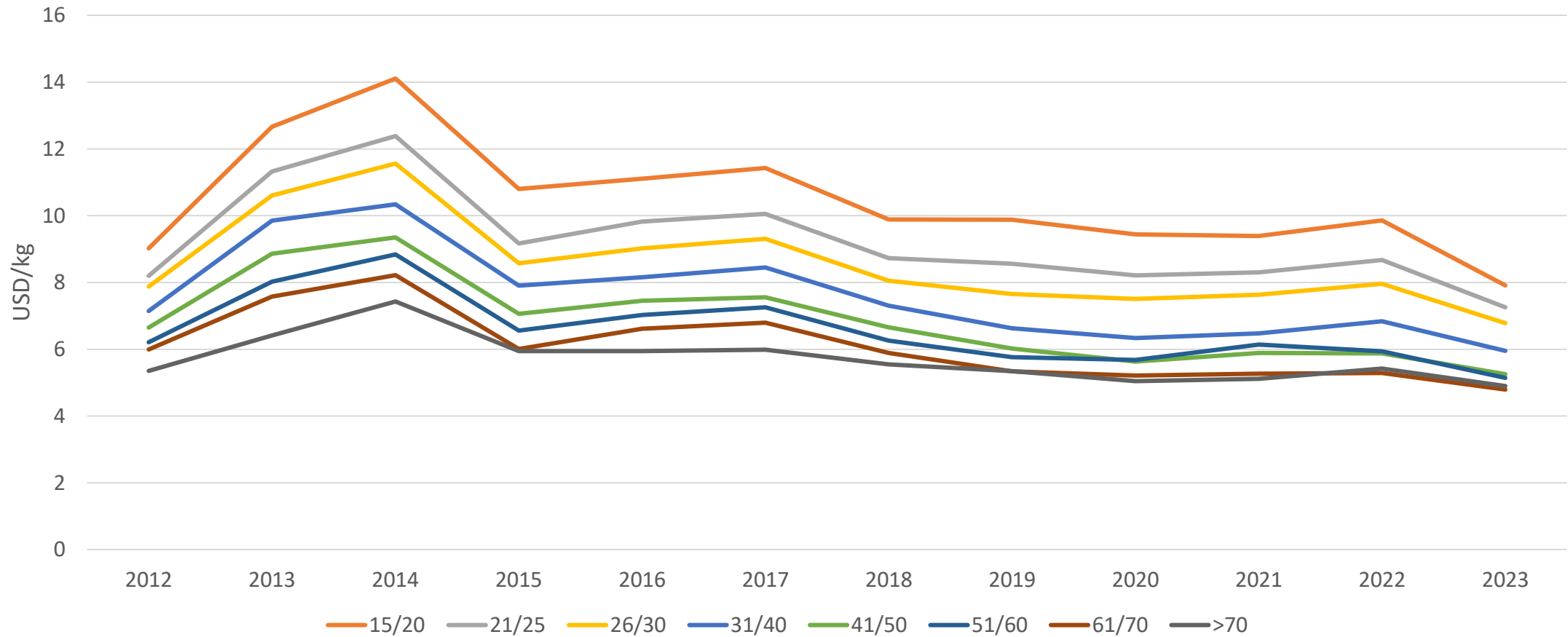
# THERE IS A GLOBAL MARKET FOR SHRIMP

- As a consequence, prices in different markets and for different products are highly correlated
- Changes in domestic production in any country only impact the price to the extent that it impacts global supply
- U.S. shrimpers have been caught up in this since the 1990s
  - As a consequence, when U.S. landings increase imports are being reduced with little impact on price and vice versa
  - A successful U.S. shrimp aquaculture industry will compete directly with imports, and the main impact on wild shrimp landings will be through the global market



# BUT THE PRICE VARY WITH A NUMBER OF QUALITY PARAMETERS

## AVERAGE ANNUAL U.S. IMPORT PRICES FOR FROZEN SHELL ON SHRIMP BY SIZE



Source: NOAA

# IT IS POSSIBLE TO OBTAIN HIGHER PRICES

- For most seafood products, fresh never frozen product gives the highest price to the producer
  - But it also requires good logistics
  - Red snapper after catch shares completely changed market being served
- It is no accident that salmon is primarily sold as fresh, and most markets being served by farmed salmon did not exist for wild
- No-one knows the potential for shrimp as a high-end product
  - U.S. aquaculture producer more generally has struggled with poor logistics, scale and delivery reliability
  - A successful domestic farmed shrimp industry will most likely benefit wild shrimpers by improved logistics and market access



# TECHNOLOGY IS RAPIDLY CHANGING AND CREATES NEW OPPORTUNITIES



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# NEW TECHNOLOGIES CREATES A NEW OPPORTUNITY FOR (SHRIMP) AQUACULTURE IN THE U.S.

- Salmon show that aquaculture does not have to be a developing country industry (or a cottage industry)
- With the right production process and logistics, capital and knowledge intensive technologies can be competitive in a high-cost environment
- Can be enhanced by quality products targeting high-end markets



# NEW TECHNOLOGIES CREATES A NEW OPPORTUNITY FOR (SHRIMP) AQUACULTURE IN THE U.S.

- Can the high-end markets be found, and fast enough?
- And can the production be matched to demand?

# NEW TECHNOLOGIES CREATES A NEW OPPORTUNITY FOR (SHRIMP) AQUACULTURE IN THE U.S.

- Can the high-end markets be found, and fast enough?
- And can the production be matched to demand?
- The conditions may never have been better for an aquaculture industry to succeed in the U.S.
  - But it will most likely take much longer, if it ever will happen, that U.S. farmed shrimp is sold at Walmart and other places where one primarily compete on cost. It is not even obvious that this is desirable.





# THANKS!



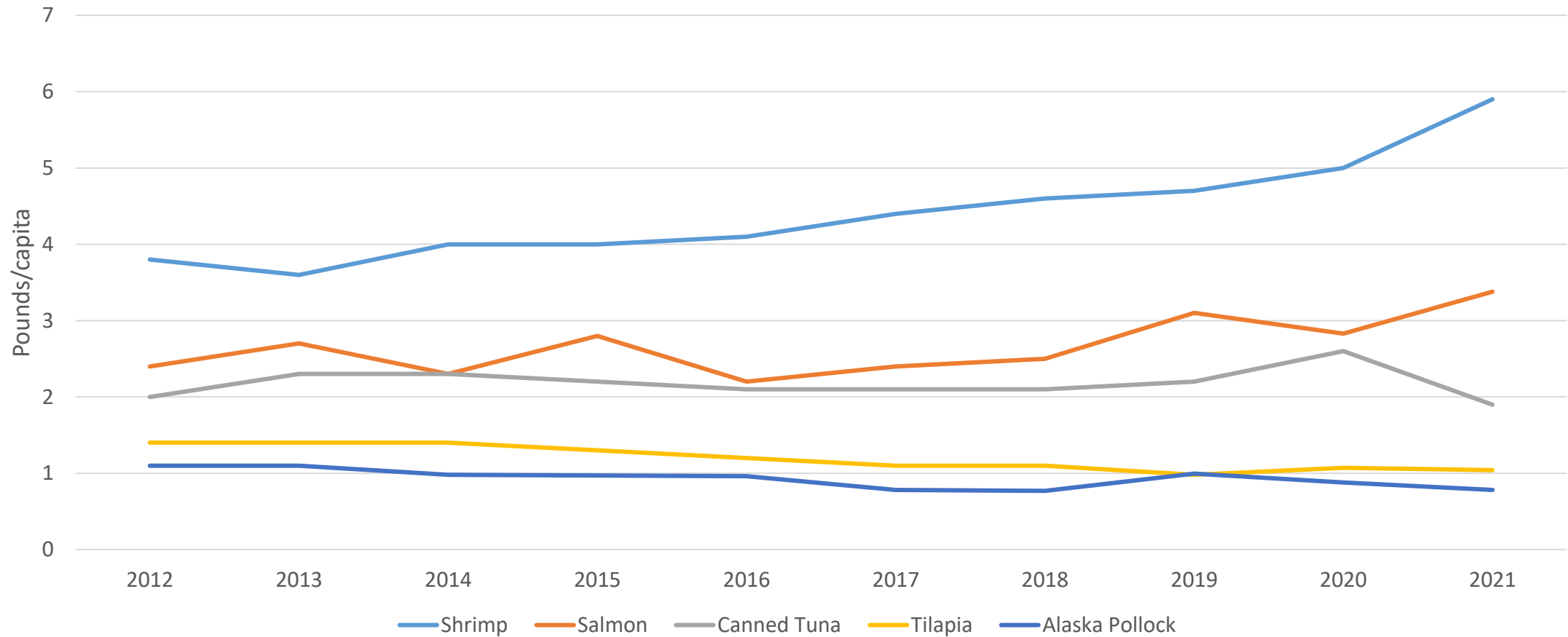
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# U.S. PER CAPITA SEAFOOD CONSUMPTION: FIVE MOST POPULAR SPECIES



# Nutrient Emissions

