

City of Gloucester: Municipal Harbor Plan Discussion Document 11/13/2013

Purpose of Today

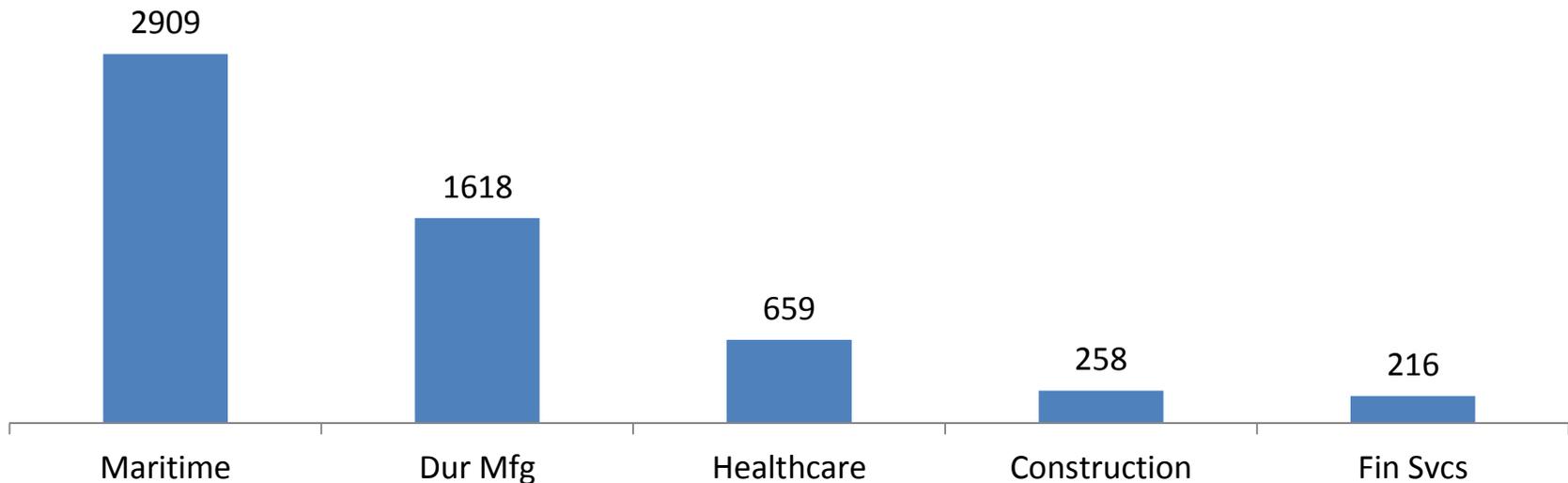
- Provide new information and perspectives on ...
 - Marine Markets for the Harbor
 - Quick Review of Planning Parameters
 - Perspectives on the DPA & Ch. 91
 - Development Programming & Planning Tools
- Listen to your ideas and concerns
- Next Steps

Maritime Economy Baseline

Gloucester maritime economy represents roughly 1/3 of all jobs in the city

- Gloucester has a total employment base of approximately 10,000 jobs*

Gloucester Employment by Key Industries & North Shore Critical Industries
Adjusted ES202
2012



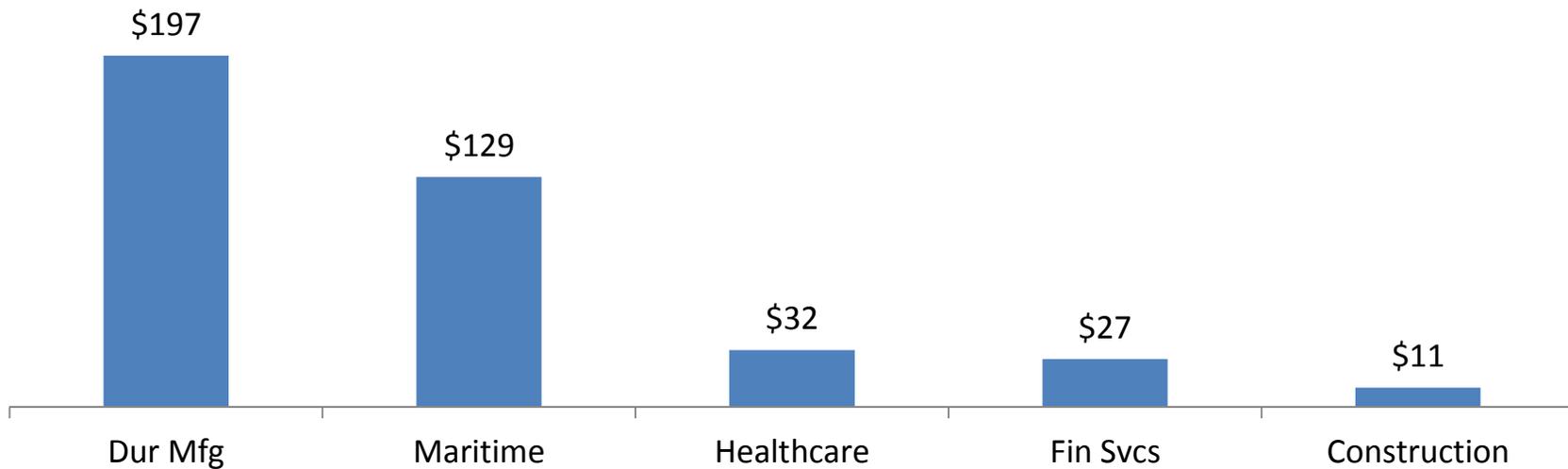
* ES 202 data shows 9581 plus the adjustment made for fishermen increases employment data to 10142

Source: NP calculations from MASS LMI data

Gloucester maritime economy represents approximately 21% of the total wage base of the city

- Gloucester has a total wage base of approximately \$609 million

Gloucester Wages by Key Industries & North Shore Critical Industries
Adjusted 2012
\$ millions



Source: NP calculations from MASS LMI data

Sector Opportunities

Recap

Marine Tech

Marine Research

Marine Resources

Fisheries & Seafood

Tourism

So What?

Is Gloucester to become a village of boutiques, labeled an “artist colony,” like Rockport?... Will Gloucester Harbor, too, be converted into a yacht basin? Or should it be preserved, as is Lunenburg, Nova Scotia, as a museum to the days of fishing?

Mark Kurlansky. *Cod*: 1997 p. 231

But to talk about the future of the fishery & the Port of Gloucester you run into a different problem

The Belgian Endive problem

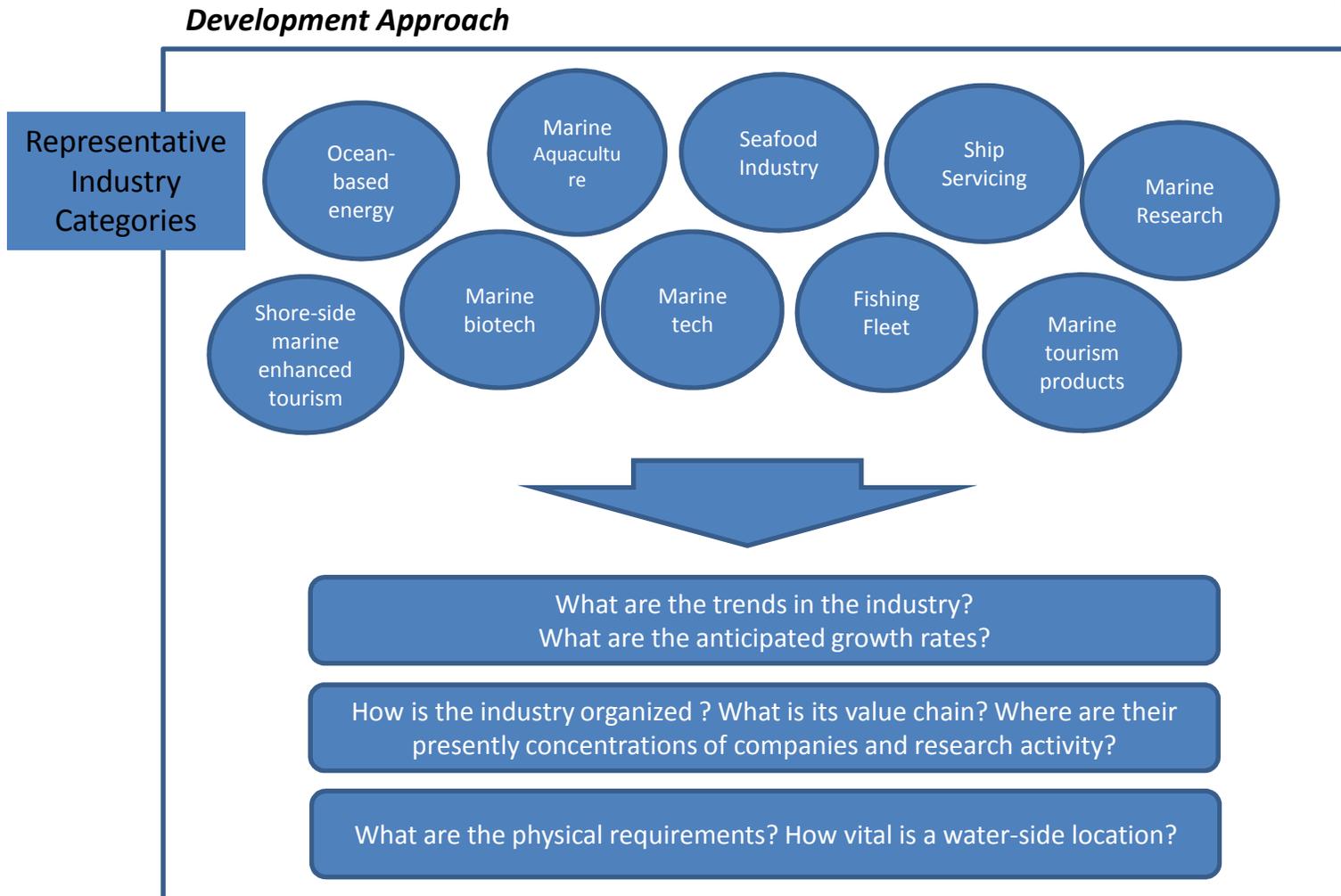
J. Danforth Quayle was delighted. His advisers grinned. Let's go after Gov. Michael S. Dukakis with a new weapon, guaranteed to get on the evening news. Let's go after Dukakis with . . . A Belgian endive.

One need only recall the Massachusetts Governor's comment, in the Iowa Presidential caucus campaign, that farmers should seek to diversify and grow alternative crops. Like Belgian endive.

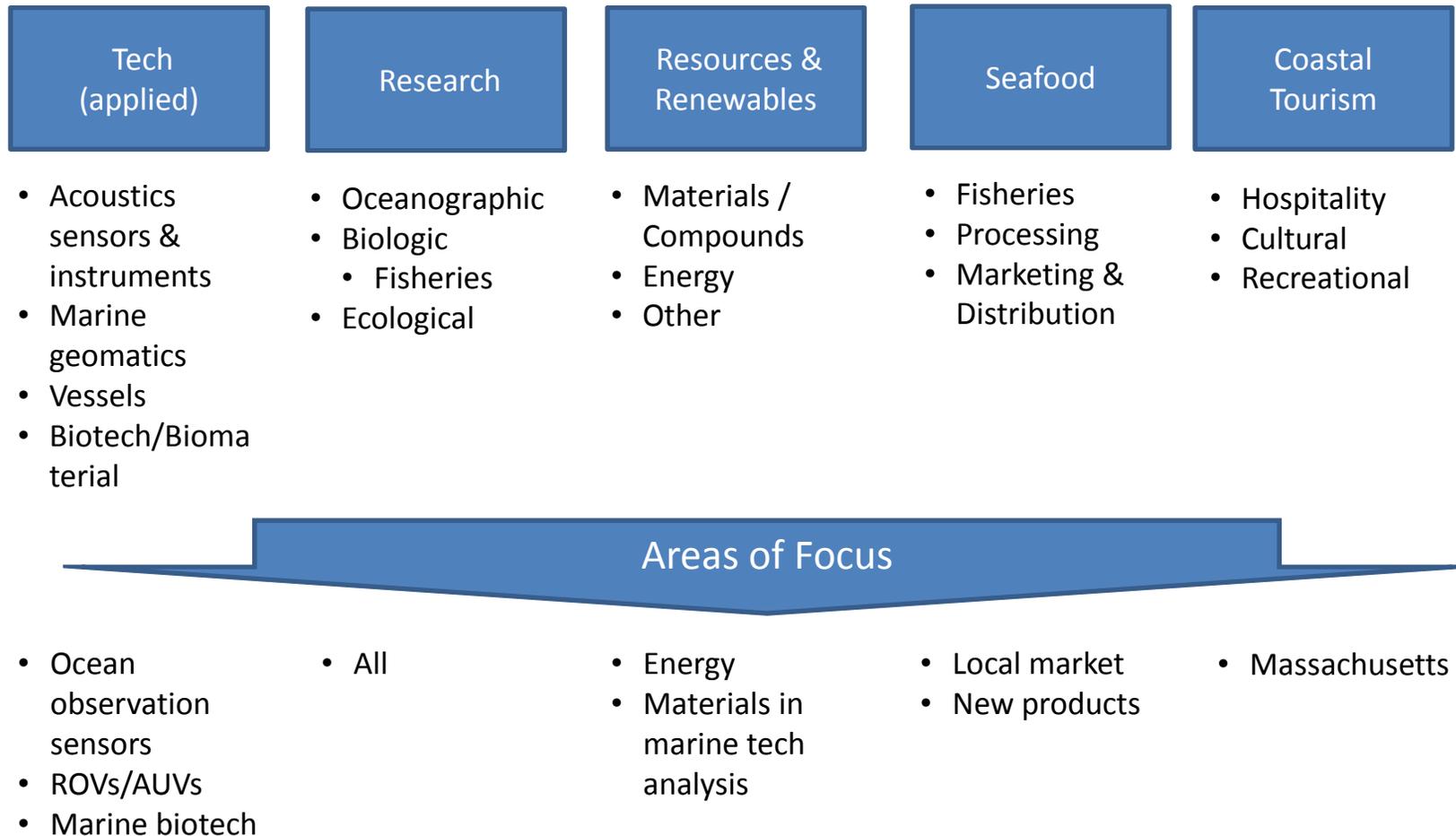
NYT, 1998

Conceptual Approach to Gloucester Maritime Economy Opportunity Analysis

Illustrative not a complete list



Maritime economy industry segments



Estimated market sizes

- The Maritime sector economy is at least \$10 billion before fisheries & seafood

Tech (applied) Global Mkt \$	Research US \$	Resources & Renewables	Seafood	Coastal Tourism
<ul style="list-style-type: none"> • Ocean Observation: \$2.2 bill <ul style="list-style-type: none"> • \$700 m US • ROV/AUVs: \$3.2b 35 companies • Marine biotech: \$3.7 b <ul style="list-style-type: none"> • Marine chitin: \$481m • Alginate: \$1.1b 	<ul style="list-style-type: none"> • \$2.5 billion in federal R&D spending excluding Navy • NSF largest source: \$1.7b <ul style="list-style-type: none"> • Mass = \$117m • Woods Hole: \$83m 	<ul style="list-style-type: none"> • Energy: unknown • Closest proposed project is HyWind 12 megawatt project 12 miles off shore of Portland Maine covering 22 square miles • Finding of no competitive interest issued by Bureau of Ocean Energy Management in Dec 2012 	<ul style="list-style-type: none"> • Total US: 4.5 billion pounds • Boston imports 2012: <ul style="list-style-type: none"> • 470m lbs rail or truck • 11m by ship • Serves processors, retail & restaurants 	<ul style="list-style-type: none"> • Mass: \$1.6 billion spend <ul style="list-style-type: none"> • Barnstable • Essex

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Ocean Observation - \$2.2 billion global industry

Demand Drivers

- Almost completely driven by US and European sponsored ocean research
- Increasing area of interest in pollution monitoring
- Marine spatial planning

Value Chain / Industry Requirements

- Increasing use of Voluntary observing ship scheme (VOSS) & Ship of Opportunity programs (SHOOP) to provide real-time monitoring and reporting
 - Tend to be ocean going cargo vessels
- Ship design is presently a problem limiting deployment potential

Locational Characteristics

- Sensor fabrication is concentrated in tech centers and marine engineering centers
- Deployment site vary but at present are envisioned to be centered on major seaports
- Major sensor arrays are deployed research vessels or specialized marine engineering support vessels
- As location for observation center: Most of the major centers are based around marine schools or marine research centers
 - GMRI
 - NERACOOS

Who is Doing It with Fishing Fleet

Very few examples

- Some technological reasons
- Some socio-political
- Ifremer - Recopesca project
- Ecotrust – Crab fishery

ROVs/AUVs - \$3.2 billion global industry

Demand Drivers

- Demand is driven naval requirements and offshore oil & gas industry
- Marine renewables particularly wind increasing segment
- Some products being designed for use with Fisheries monitoring

Value Chain / Industry Requirements

- ROV/AUV business is systems integration
- Suppliers are specialized in marine parts manufacturing
- Software capability is critical
- Deployment is typically handled by ROV operators with vessels with cranes & room for deployment of mobile control room

Locational Characteristics

- Companies are located in one of 3 types of locations
 - Technology hub
 - Industry customer locations
 - Founder location / Serendipity
- Waterfront requirements
 - Need controlled and open water testing/training
 - Not required (4 do have waterfront locations, 31 do not)

Who is Doing It

- Technology development driven by Office of Naval Research
- Falmouth MA is a major hub for this industry based out of naval and oceanic research
- Maritime provinces of Canada, and Ireland have made major research investments into technology

Marine Biotech – \$3.7 billion global industry

Demand Drivers

- Medicinal compounds dependent on successful conversion to biopharmaceuticals
- Chemicals used as additives, catalysts or other inputs driven by replacement potential of marine-derived compounds for existing sources
- Source identification / supply chain quality
- Biosensors dependent on cost effective integration of biologic compounds with electronic sensor technology

Value Chain / Industry Requirements

Manufactured Products

- Discovery
- Cultivation
- Extraction / synthesis
- Manufacture

Research

- Basic Science
- Tech Transfer

Locational Characteristics

- Varies by value chain position
- Cultivation & extraction tend to be closely tied to each other particularly for seaweed/algae-based products
- Marine biosensors/biopharma research tends to be co-located with marine science programs
- Marine genomics programs are split between existing 'omics research centers and marine biology centers

Who is doing it (US – based)

Marine Biotech

- Biosensors: primarily university-led
- BioPharma: 13 products in clinical trials phase
- Marine genomics: emerging field based on preexisting technologies applied to marine life
 - 6 identified Marine Genomic centers

Marine Biomaterials

- FMC Biopolymer
 - Dungeness Environmental
 - AgraTech
- } Relatively few US producers

Marine Tech Opportunities for Gloucester

Ocean Observation Opportunity

- For fleet: Will depend on participation of fleet and advancement of equipment
- For shoreside: most likely scenario is as satellite for preexisting observation center or new fisheries observation center built with NMFS

ROVs/AUVs Opportunity

- Substantial in-state presence in Falmouth MA
- Growth in offshore marine renewable energy and use in fisheries monitoring could serve as catalyst for location of deployment capability
- Emerging industry related to OOS and ROV data use is marine geomatics

Marine Biotech

- Biopharmaceuticals: Opportunistic
- Biomaterials: High potential area for Gloucester due to existing processing infrastructure and linkages to research programs
- Marine genomics: Emerging field with no established leadership; builds on 'omics capabilities of greater Boston

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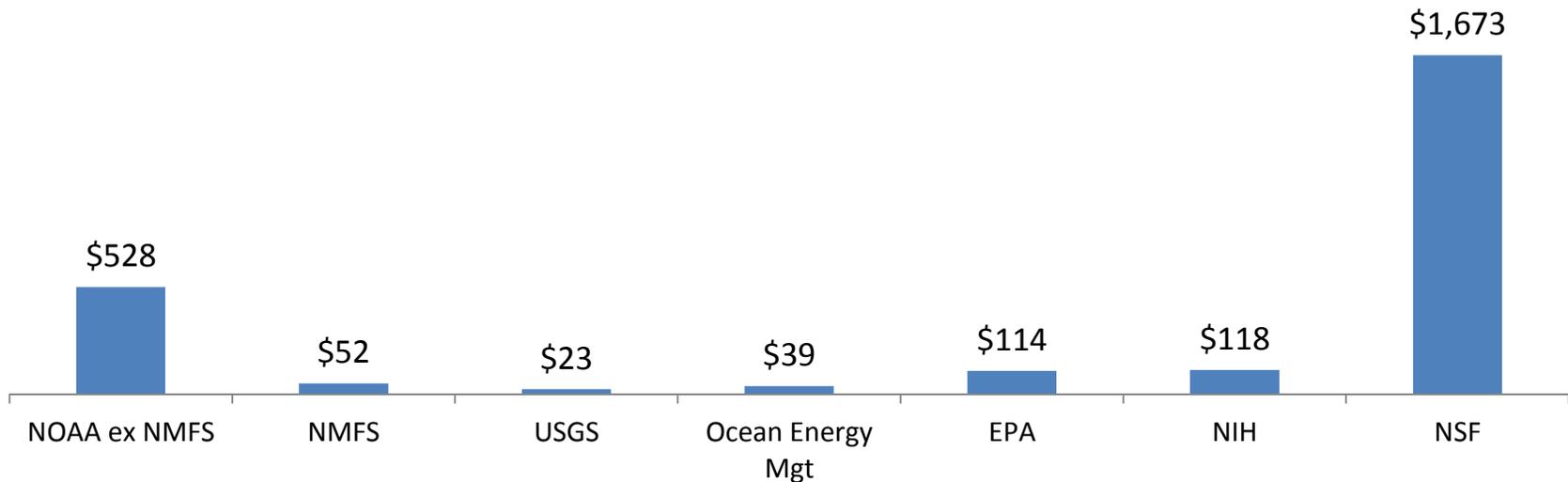
Tourism

So What?

Federal research dollars supporting marine technology & fisheries development – excluding defense

- Total: \$2.5 billion
- Office of Naval Research applied research budget \$4.7 billion

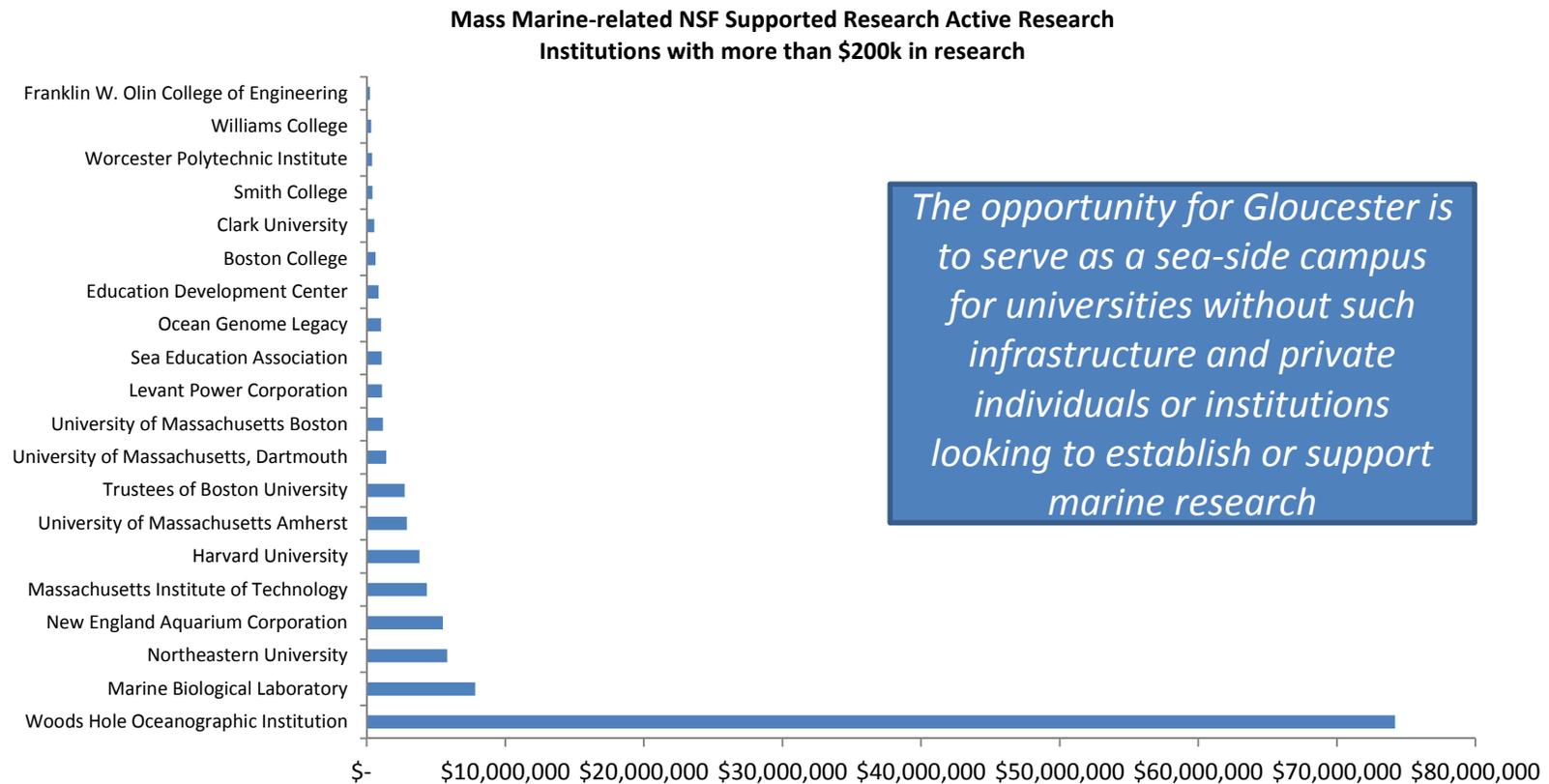
Federal R&D Excluding Defense
Ocean & Water R&D Spending
FFY 2012 excludes sequestration
\$millions



Source: NP estimates based on Congressional Research Service Federal Research and Development Funding, FY2013, April 2013.
NIH & NSF based on key word search of active awards over multiple years. NIH keyword search = Marine

Massachusetts ranks 3rd in NSF funded marine-related research

- \$117 million in funded research



Source: NP analysis of NSF active awards

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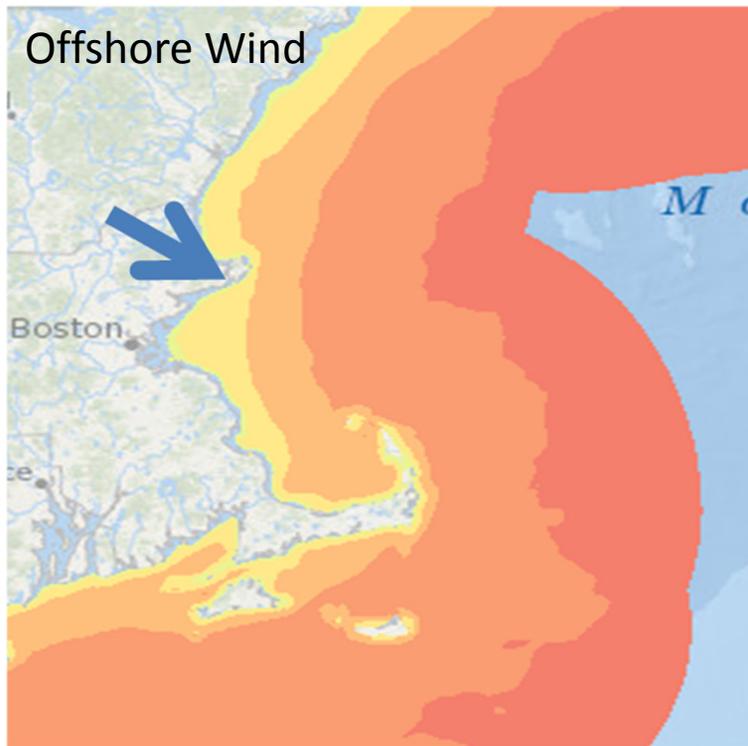
Fisheries & Seafood

Tourism

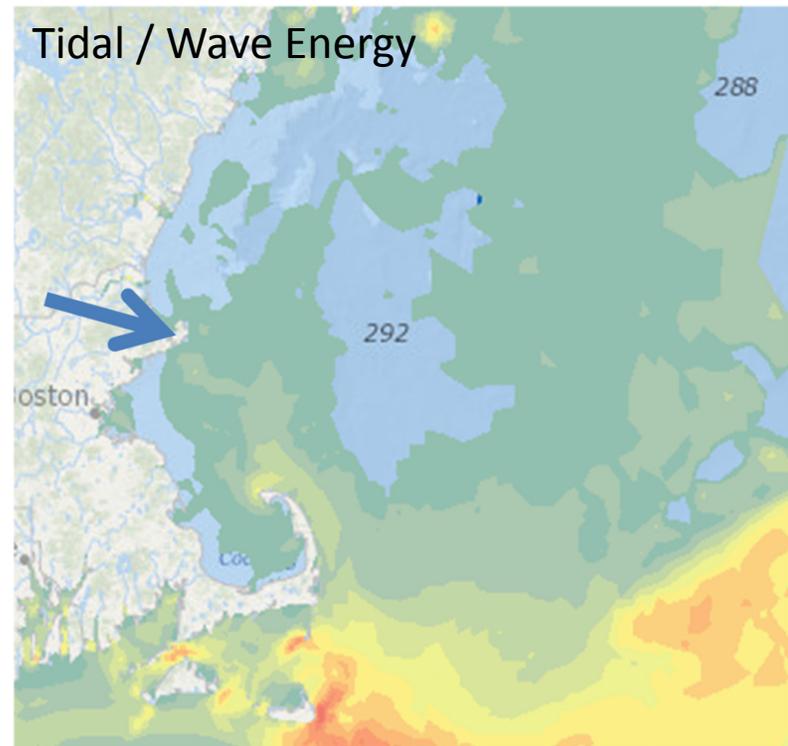
So What?

Gloucester potential as a service port for offshore renewable energy projects

Gloucester is a potential location to support offshore wind



It is less likely to be a support location for wave or tidal energy



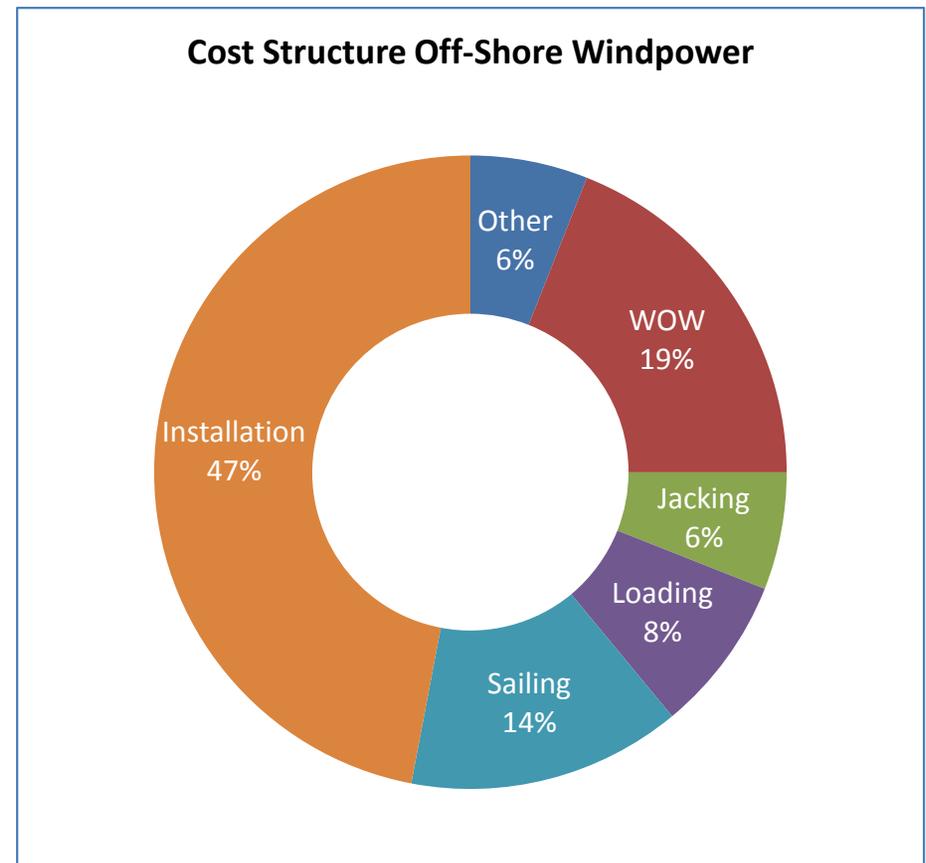
Source: Northeast Ocean Data.org

Off-shore wind energy requires substantial vessel support

- For a 1000 offshore turbine field
 - 20 vessels needed to install pods
 - 14 vessels to install turbines
 - 8 vessels to support maintenance of turbine field



A 1 GW wind farm would utilize a small fraction of the existing Gloucester fleet



Source: Motorship, Feb 2013

However, the existing Gloucester fleet may require substantial modification to be used effectively for offshore support

Illustrative examples



And its not a near term solution

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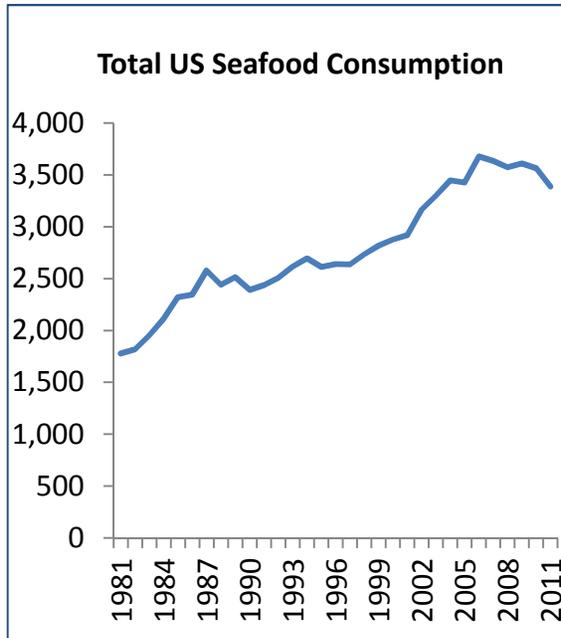
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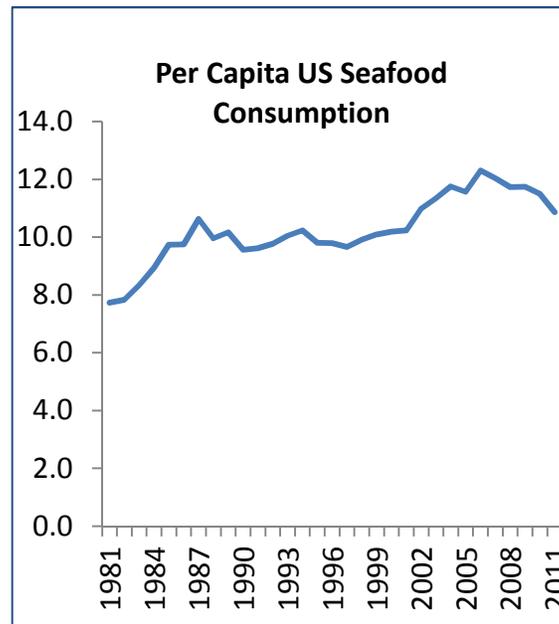
So What?

Overall US seafood market demand

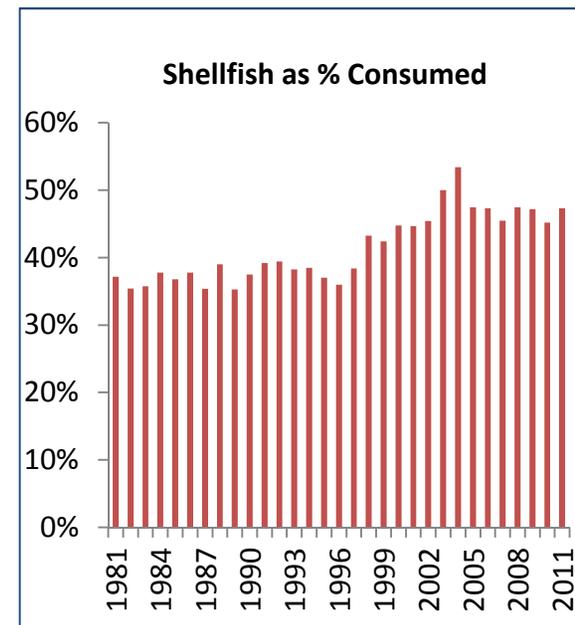
Total consumption has been rising...



But on a per capita basis its flat...



With shellfish representing a larger share

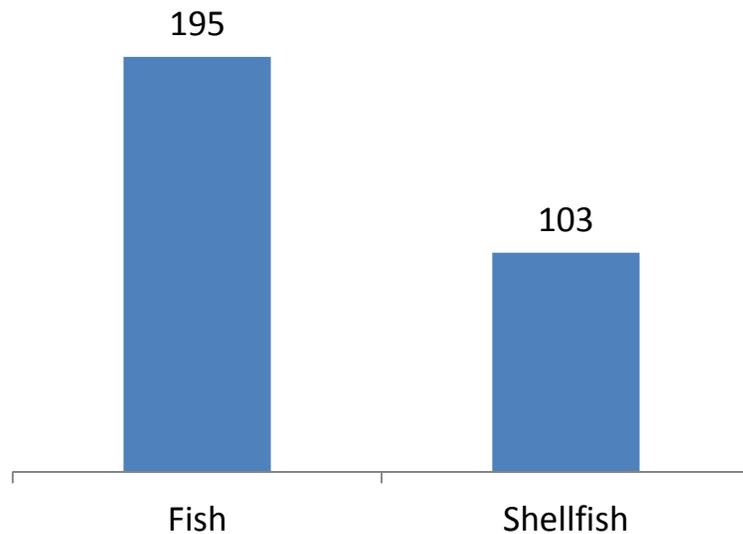


Market demand in Boston area

In 2012 Massachusetts landed 298 million lbs of fish and shellfish...

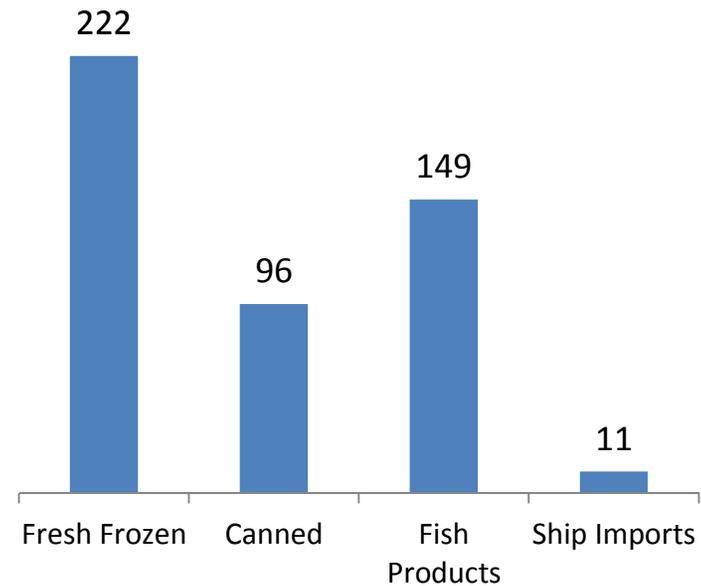
478 million lbs of seafood and fish products were shipped to the Boston area in 2012

Massachusetts Landings
Millions of lbs
2012



Source: NP analysis of NMFS commercial landings data, 2012

Seafood Shipped into Boston area
Millions of lbs
2012

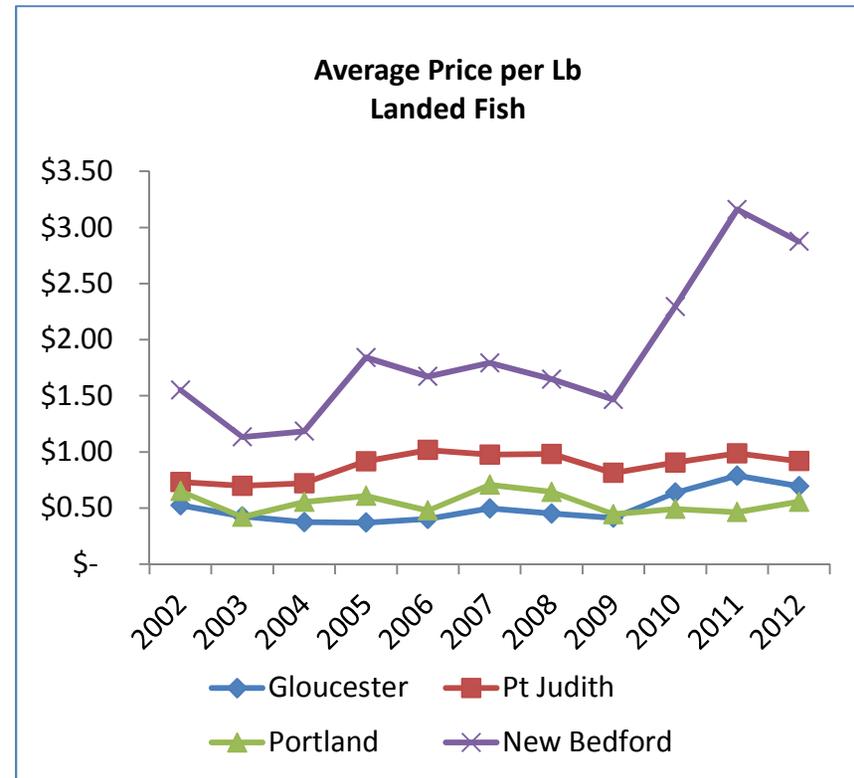
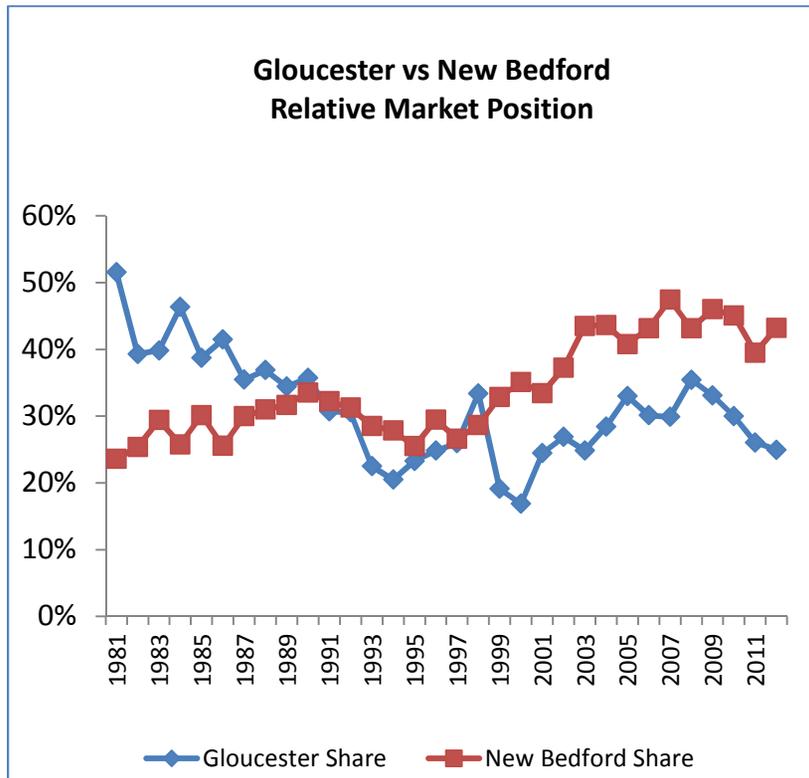


Source: NP analysis of IHS transtat data

Gloucester fishing port market position

Since the early 1990s Gloucester has gradually been losing position to New Bedford as New England's fishing capital...

... and until recently has had among the lowest price per pound of the major fishing ports



Source: NP analysis of NMFS data

Observations

- Seafood is an industry that is flat in terms of its penetration into US food consumption
 - A number of companies are pursuing product innovations in the area of the seafood
- There is a substantial amount of local demand
 - Gloucester could not meet all the demand for seafood products in the Boston region alone
- Gloucester's market position (and port) has been built on large volume, relatively low price realization fishing product
 - It's a fishery product that has been substituted by other species and locations
 - And as volume drops the ability to sustain core support services becomes more difficult
 - Basic fleet cost structure (e.g. fuel) issues put pressure on continued dependence on low yielding (price and volume) fisheries

- For the fleet and core support services to survive several things need to be considered
 - Catch diversification
 - Including product introduction strategy
 - Capturing a larger percentage of the value added in the seafood value chain
 - May require branding & positioning
 - Product development
 - Distribution channel development
 - Demonstrated sustainability including food-mile carbon footprint impacts

Example: Patagonian Toothfish



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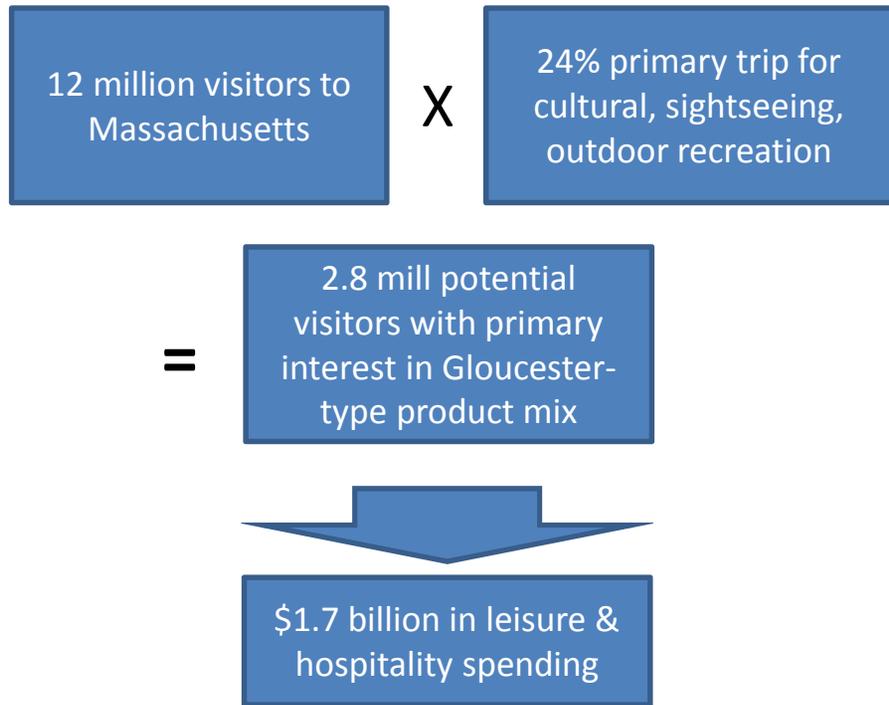
Marine Resources

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So What?

Market potential



Discussion

- 1% share = \$17 million
- Gloucester hospitality industry generates at least \$76 million in revenue
 - an estimated \$41 million is tourism-related based on the seasonality adjustments

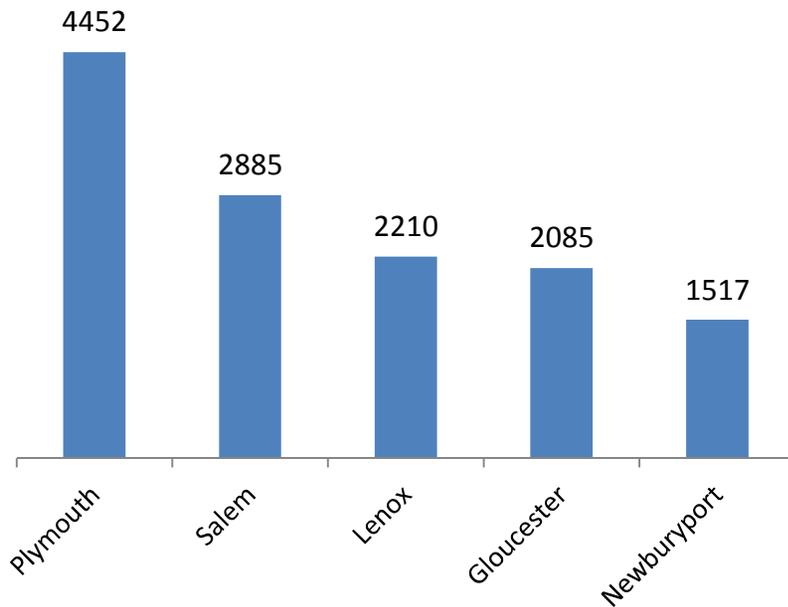
Source: NP calculations based on MOTT 2012 Annual Report data & Discover New England Tourism Guides & City tax reports

Comparing Gloucester's "tourism economy" - leisure & hospitality indicator

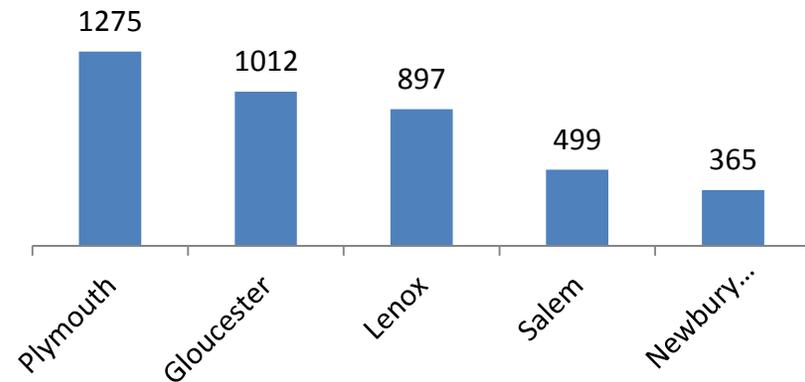
Gloucester's "tourism" sector is smaller than other tourism communities (which are not huge employers)...

...but much more dependent on the tourist season than the tourist communities

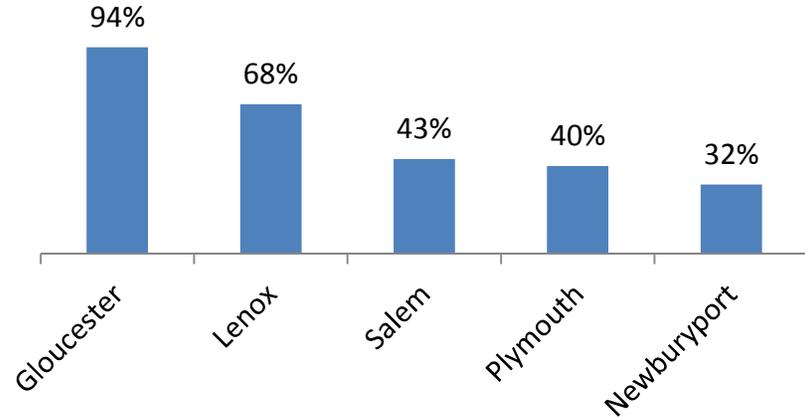
Peak Month Leisure & Hospitality Employment



Peak to March Baseline Differential



Peak % Above Baseline



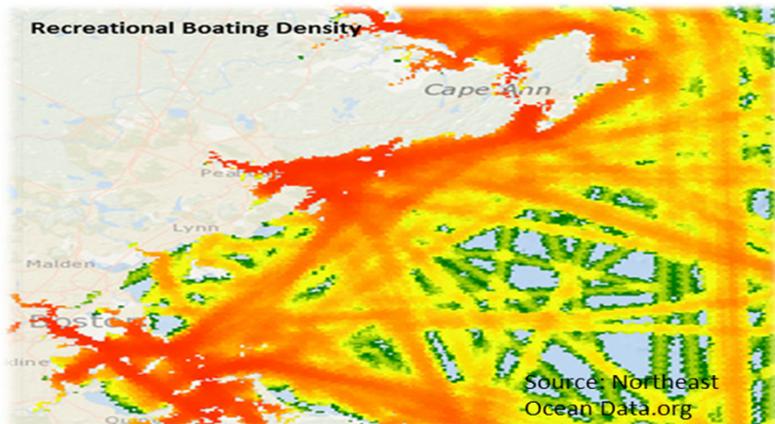
Source: NP calculations of ES 202 data

Growth factors for Gloucester tourism

Product Attributes:

- Unique sightseeing with active fishing port
- Whale Watching:
 - 4 of 19 whale watching offerings
 - 21% of all of New England
- Cultural Attractions
 - 1 of 19 museums north of Boston

Gloucester is also strategically located in a major center of recreational boating



A thorough visitor driven product-level analysis was not conducted but in general options include:

- *Programming to lengthen season into shoulder seasons*
- *Making the fishing port more sight-seeing friendly*
- *Visitor experience of existing harbor and downtown sites & attractions*
- *Opportunities for more eco/ocean-related tourism*
- *More visitation modes / channels*

Source: NP calculations based on MOTT 2012 Annual Report data
& Discover New England Tourism Guides & City tax reports

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Sector opportunities assessment

Opportunistic

- Marine tech
- Marine research



- Lack of a major anchor plus established centers limits growth potential
- Gloucester's location coupled with a flexible/adaptive regulatory structure could create the right "serendipity"

Target for Growth

- Marine biomaterials
 - Research
 - Translational science
 - Product mfg



- A current area of interest and investment by the private sector
- Differentiates from most existing marine science research in MASS

Strengthen thru innovative product development

- Tourism
- Fisheries & Seafood

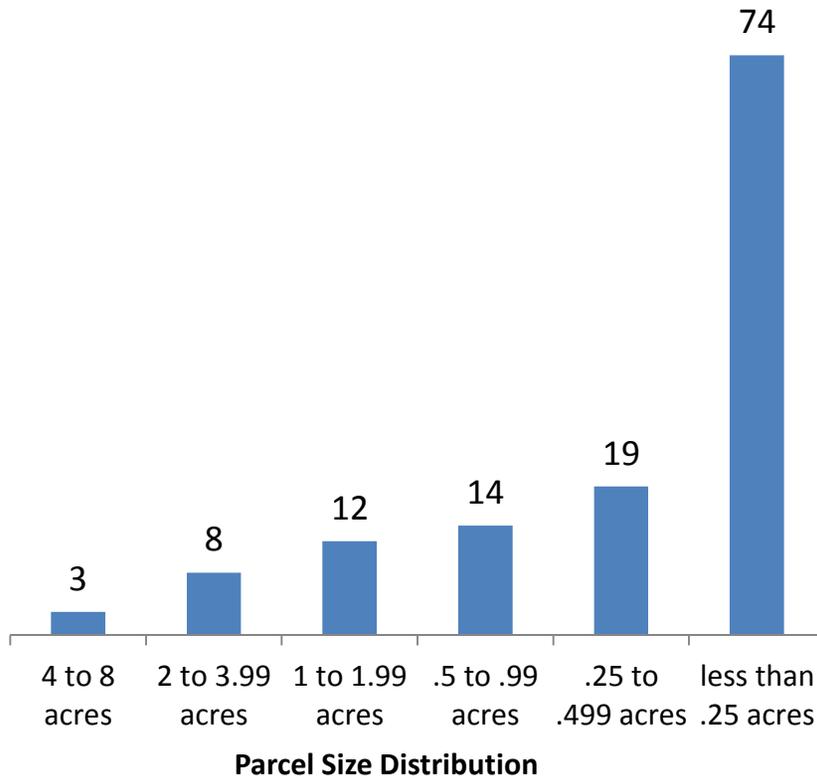


- It's a fundamental component of the city's economy
- Opportunities to stabilize & generate some growth through diversification

Harbor Planning Parameters Refresh

Most of the parcels in the Harbor are less than a 1/2 acre in size.

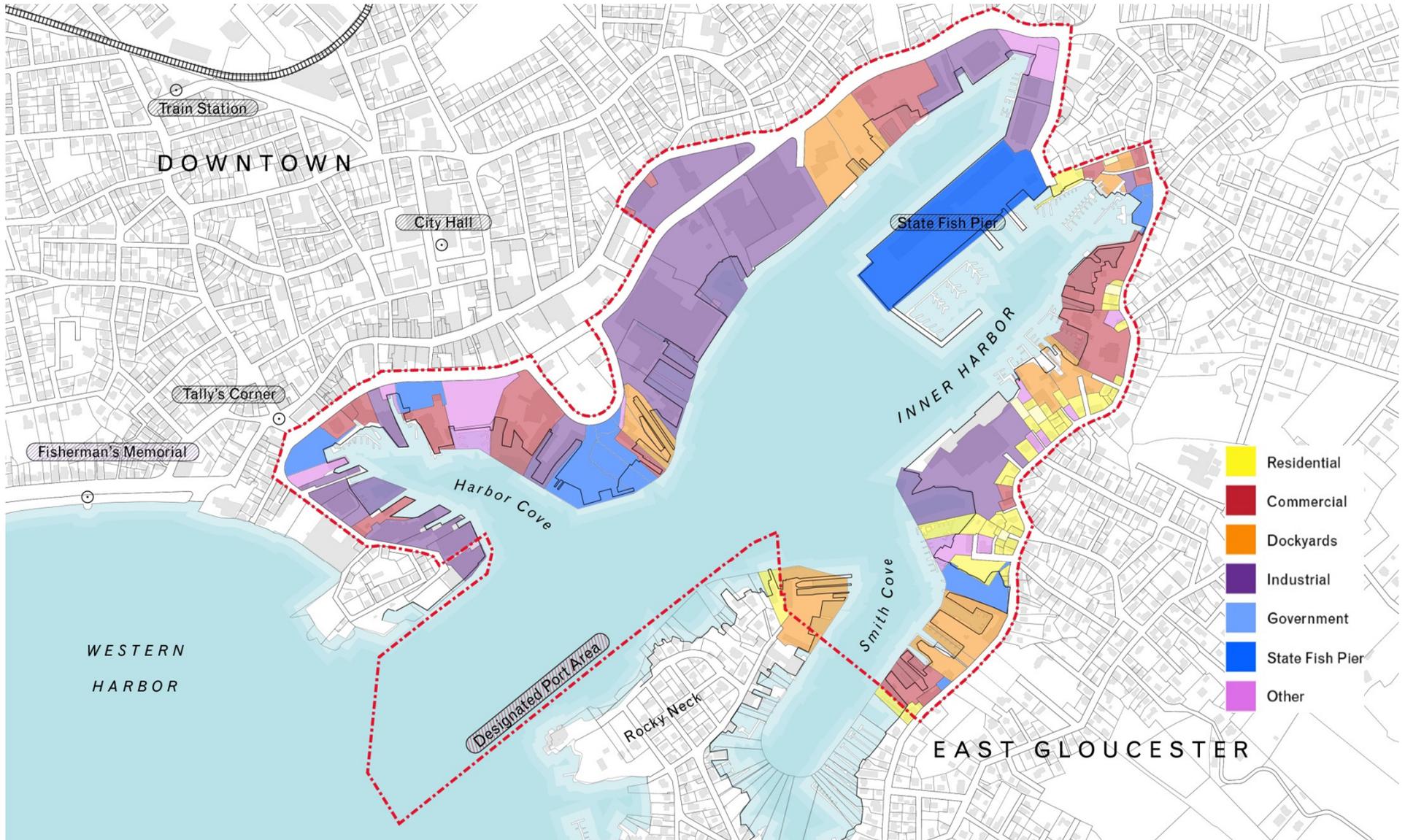
Distribution of Parcels in the DPA by Land Area



Includes government and state fish pier

- Average parcel size in the Harbor is .61 acres
- By comparison:
 - Average parcel size in Gloucester is 1.5 acres
 - Average parcel size for the BP (business park) zone is 5.8 acres
 - Average parcel size for GI (general industry zone) is 3.5 acres
 - Average parcel size for MI (marine industrial) is .67 acres

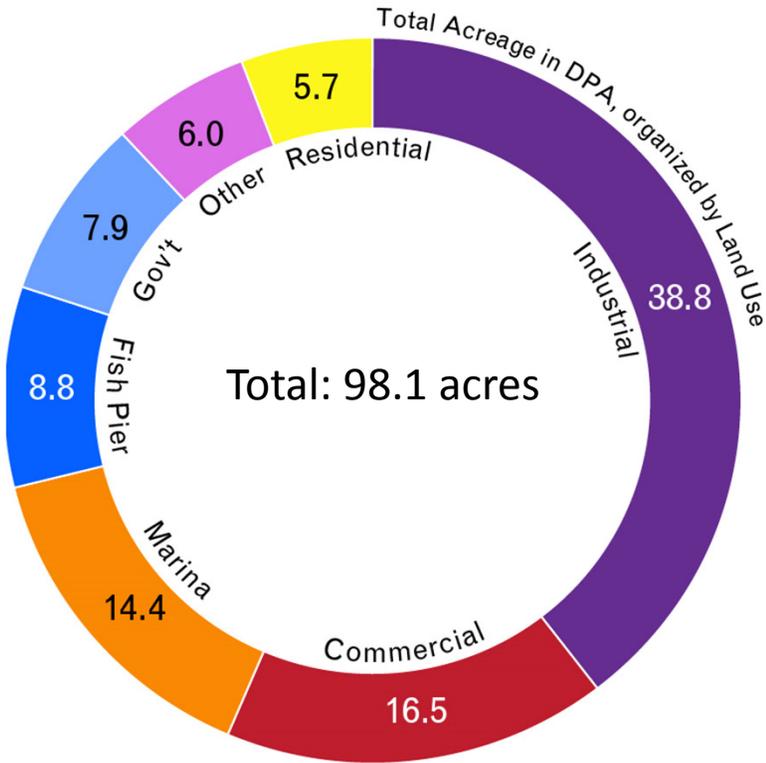
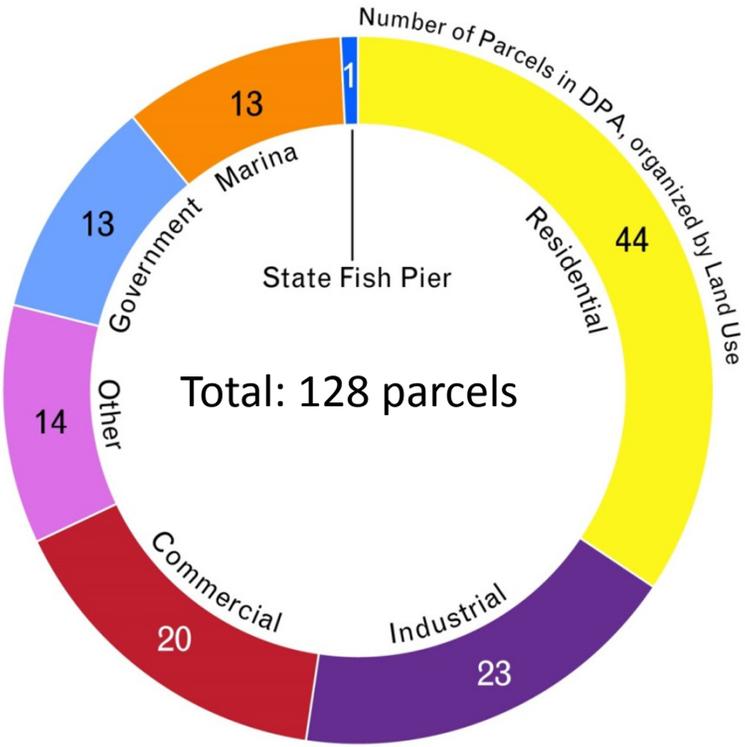
The Harbor is a “quilt,” consisting of a mix of uses with clear concentrations of like uses in different areas.



Residential represents the largest number of parcels.

Most of the parcels are residential

But most of the acreage is tied to industrial or water dependent uses



- Residential
- Commercial
- Dockyards
- Industrial
- Government
- State Fish Pier
- Other

Planning in the DPA also needs to consider abutting uses not just uses within the DPA

- For example, 43% of the DPA abuts existing residential uses
- Some residential parcels are relatively close to the DPA boundary

