NEW ENGLAND
FISHERY MANAGEMENT COUNCIL

Ecosystems Pilot Project

Stakeholder Views

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Overview

- **Intro the pilot project**
- **Constructing the workshops**
- **Conducting the workshops**
- **Survey**
- **What have we learned?**

Intro to the pilot project

1. **Introduce concepts of ecosystem-based management to Council and public**

   - *Committee/Council presentations, conferences, etc.*

2. **Inform the broad (EBM) and narrow (EBFM) views of these concepts**

   - *Jurisdictional issues paper*
   - *Coastal pollution paper*

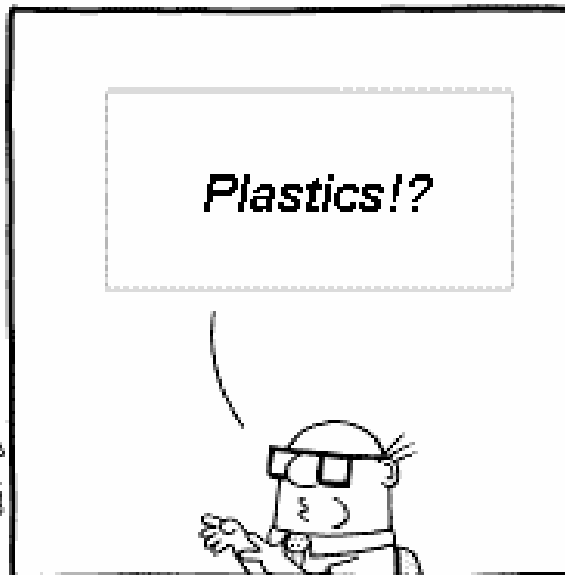3. **Collect information from stakeholders relevant to improving management in New England**

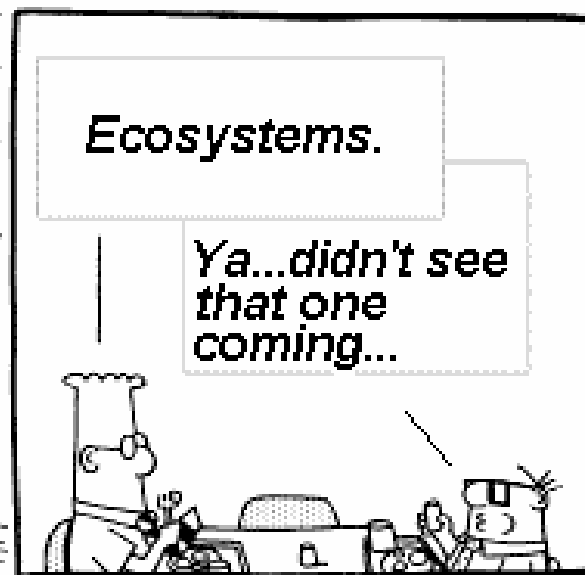   - *Stakeholder workshops*
   - *Attitudes and values survey*

Constructing the workshops

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Defining the stakeholder universe

SU ≅

$$\Sigma \mid (NE, MA, SE, HQ)i, j/ + CVDBS \; i, j$$

Compile sample frame from available data sources

- **NEFMC, MAFMC, NOAA HQ, CVDBS**
- **Combine into one database**
  - **Eliminate duplicates**
  - **Clean data**
  - **Reformat addresses/zip codes**
- **Focus on New England states (CT, RI, MA, VT, NH, ME)**

Examine sample frame data

Total number of observations = 4,780

State	CT	MA	ME	NH	RI	VT
Number	208	2282	1611	263	401	15

Source	SAFMC	MAFMC	NEFMC	NOAA_HQ	NOAA_VPS
Number	48	202	1010	289	2919

Examine sample frame data

TYPE	Frequency	Percent
Harvester	2917	61.03
NGO	97	2.03
NOAA	95	1.99
Press	20	0.42
Science	20	0.42
Aquaculture	34	0.71
Charter	2	0.04
Commission	30	0.63
Consultant	3	0.06
Department	116	2.43
Exporter	20	0.42
Government	14	0.29
Importer	98	2.05
Seafood	63	1.32
University	69	1.44
not class	1182	24.73

Sample frame

Sample Frame Zip Codes
Number Per Polygon

- 1 - 6
- 7 - 17
- 18 - 36
- 37 - 82
- 83 - 256
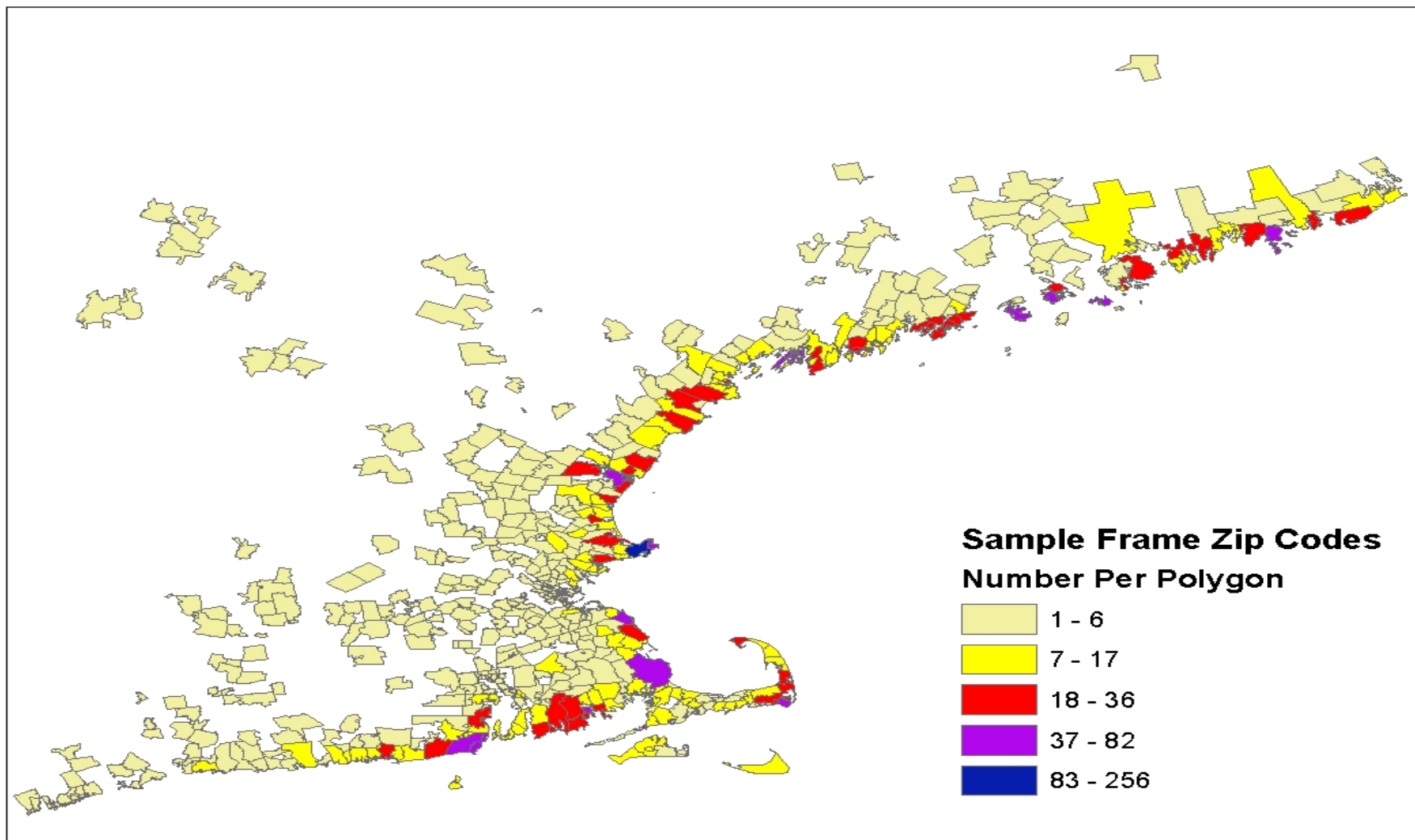
Objective:

(1) Schedule workshops such that the maximum number of stakeholders may attend from within a reasonable distance, and

(2) Attract the widest range of constituents possible

- **Algorithm to maximize number of addresses**
  - based on central lat/lon of zip code area
  - given specified ranges and specific number of meetings
- **Randomly investigated different distances and numbers of workshops**

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- **Towns selected not necessarily in major fishing ports (e.g. Gilbertville, MA…New Braintree, MA…Sorrento, ME…)**
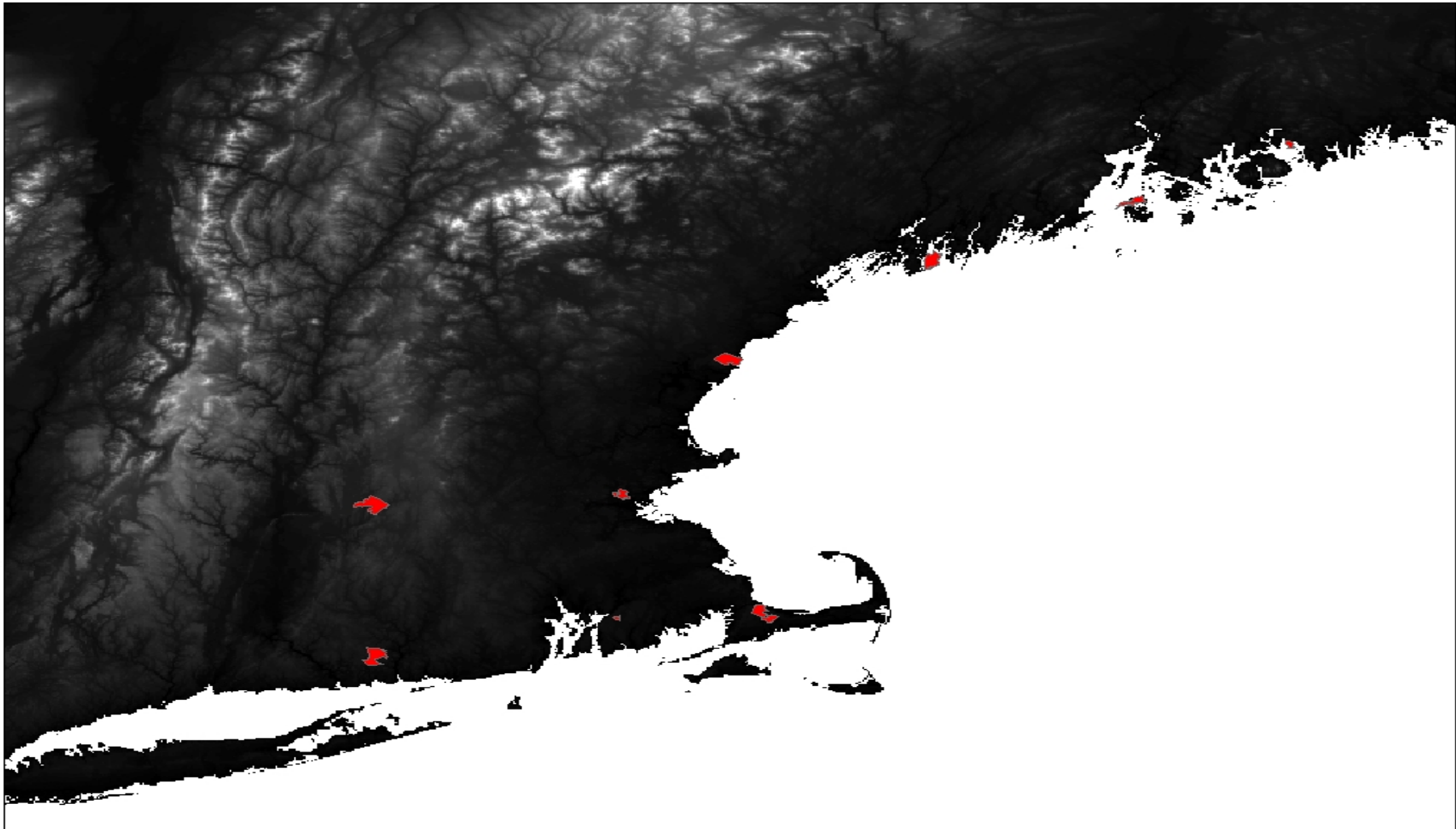
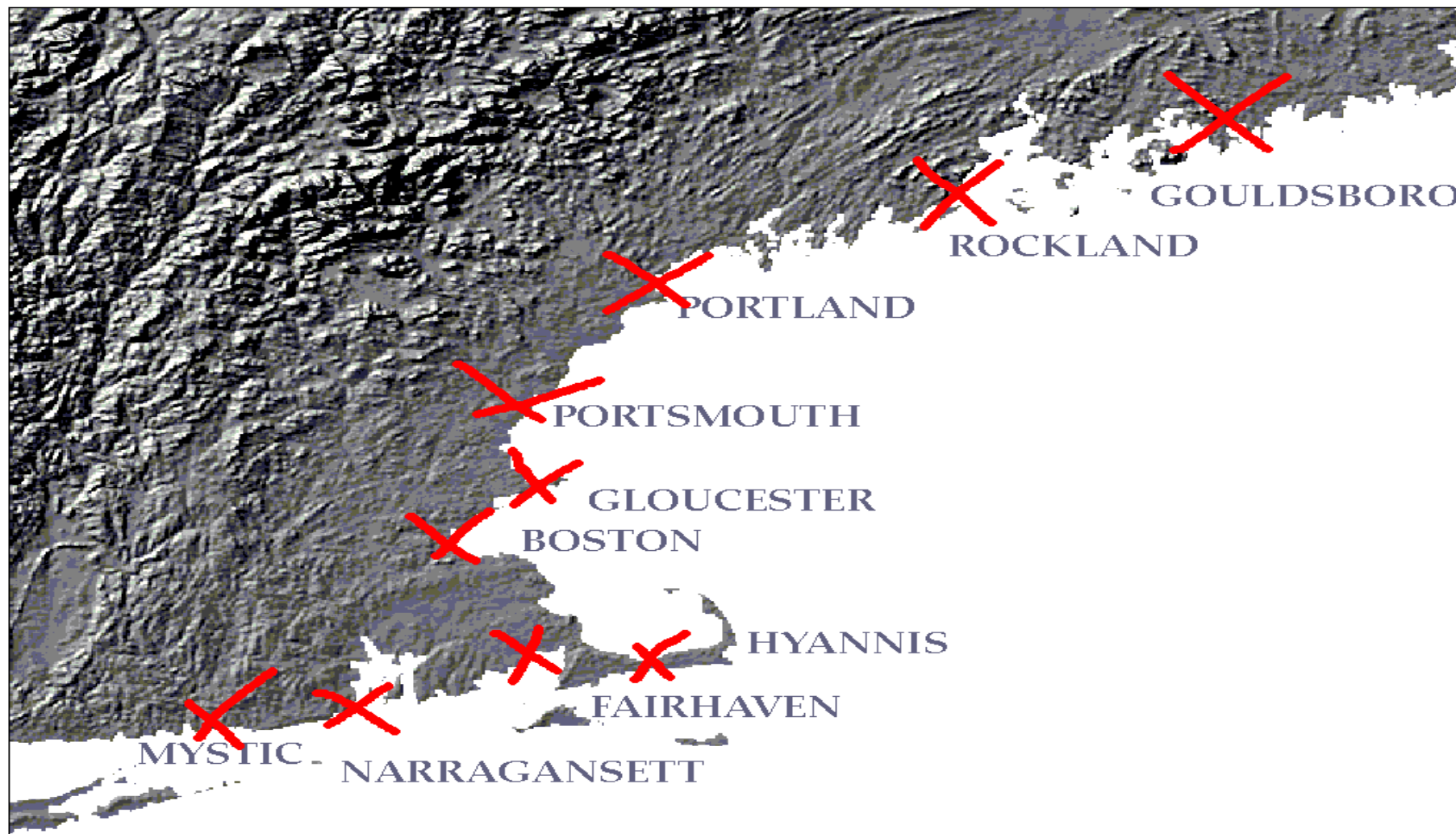- **Non-coastal sites more central, may attract 'non-traditional' identified stakeholders**

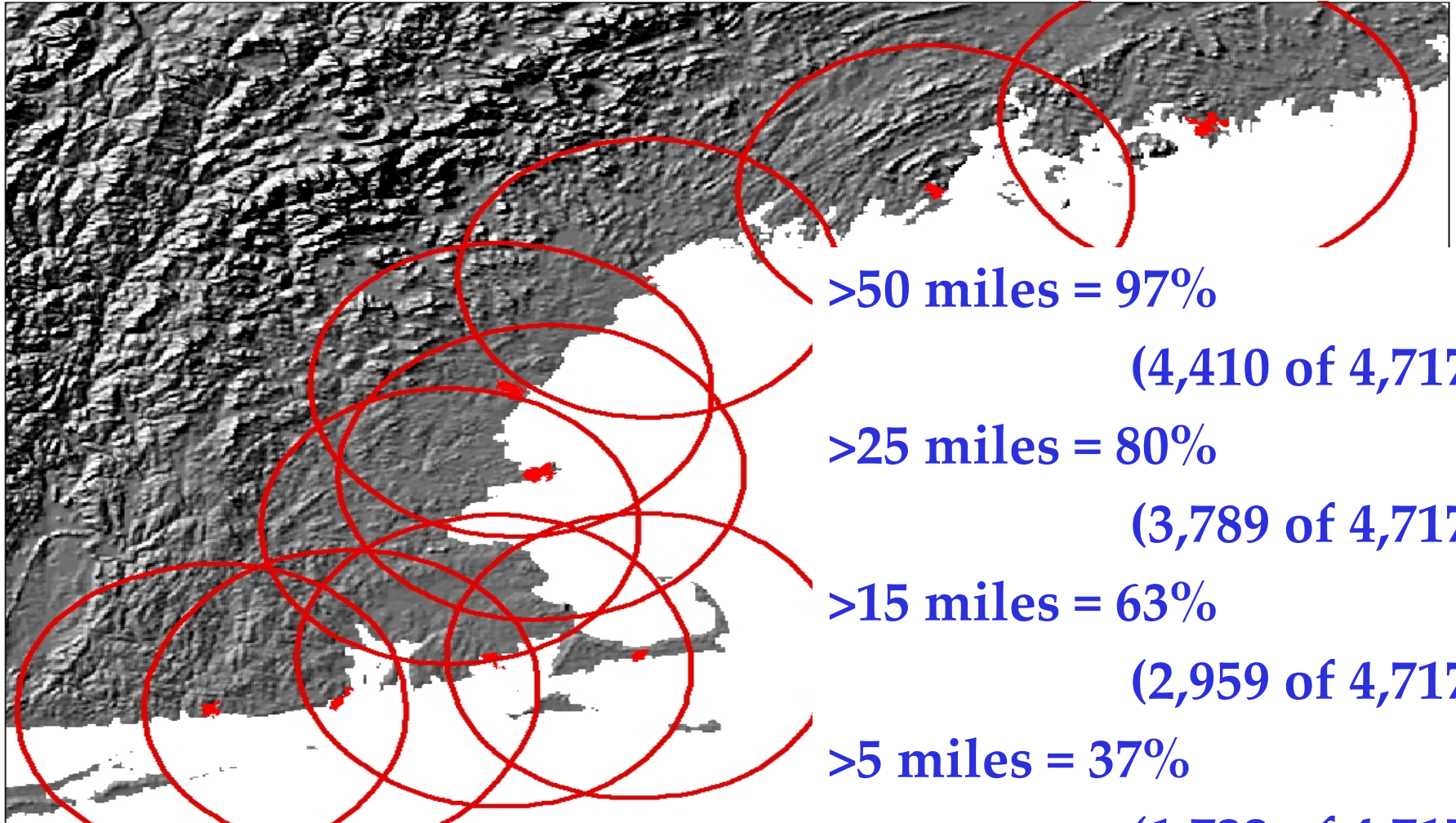- **Highlighted the potential for neglect in central-eastern Maine**

Sample results

Sample frame availability

>50 miles = 97%

(4,410 of 4,717)

>25 miles = 80%

(3,789 of 4,717)

>15 miles = 63%

(2,959 of 4,717)

>5 miles = 37%

(1,722 of 4,717)

- **Mailing to all stakeholders**
- **Press release**
- **Federal Register Notice**
- **Personal communication**
- **NEFMC website**

Conducting the workshops

A five-pronged attack:

- Objectives for fishery management
- Indicators of a healthy fishery
- Matching tools to objectives
- Delineating local ecosystem boundaries
- Capacity for local governance

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Co-facilitated

w/ Kathy Mills, Patricia Pinto de Silva

Solicit broadest range of views

Not seeking consensus

Small groups
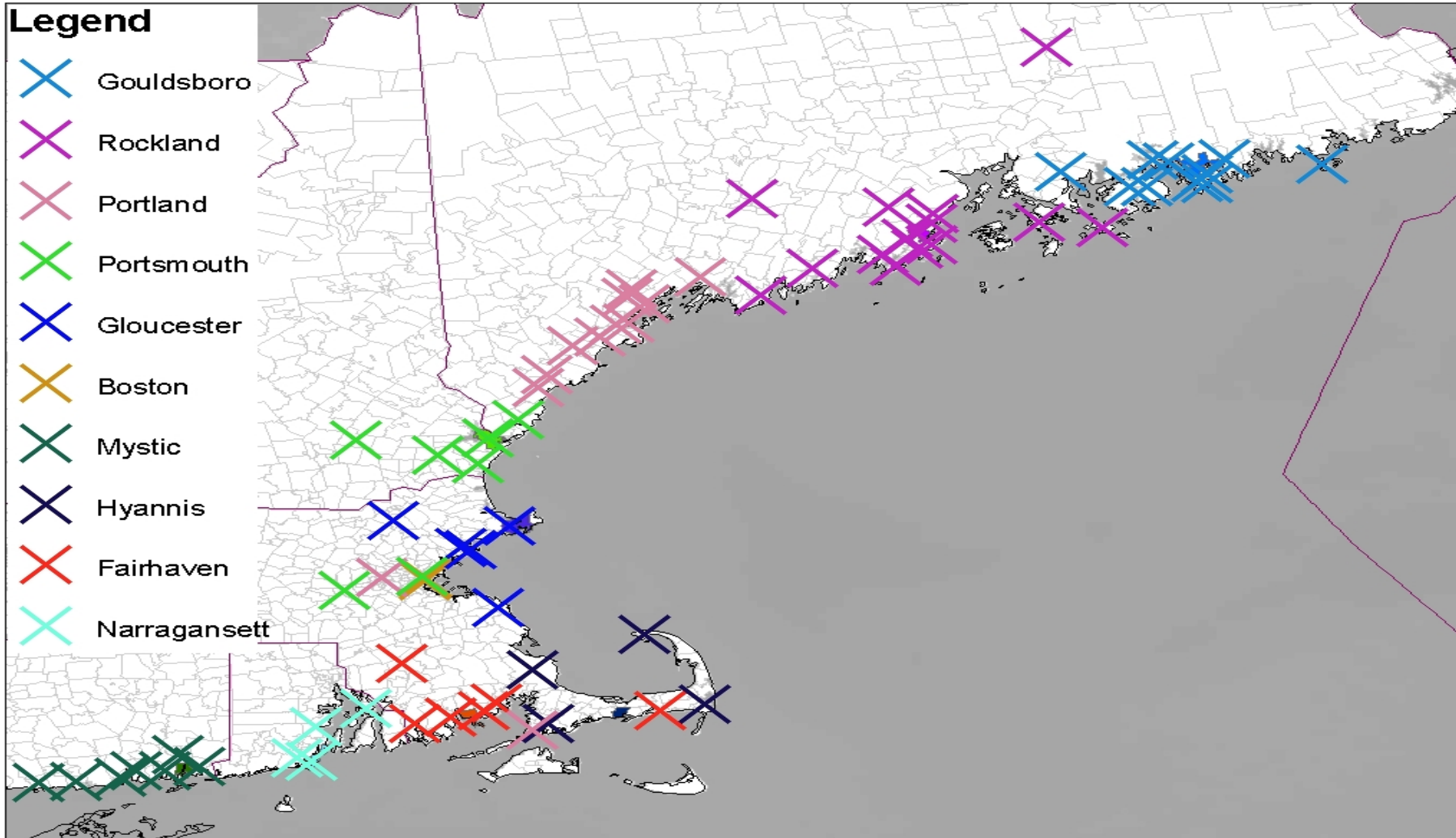
Divide into two if more than 12-14 people

Participation

Gouldsboro	**17**
Rockland	**17**
Portland	**21**
Portsmouth	**11**
Gloucester	**15**
Boston	**9**
Mystic	**11**
Hyannis	**8**
Fairhaven	**15**
Narragansett	**11**

Participation

	Active Participants	Passive Participants	Pct Active
Gouldsboro	17	0	100%
Rockland	12	5	71%
Portland	19	2	90%
Portsmouth	10	1	91%
Gloucester	14	1	93%
Boston	6	3	67%
Mystic	9	2	82%
Hyannis	7	1	88%
Fairhaven	10	5	67%
Narragansett	9	2	82%
total	113	22	84%

Composition

	Acad/research	Com. fisherman	Dealer	Ind Rep	NGO	Public/Other	Rec. fisherman	State/federal manager	State/federal scientist	Stdnt
Gouldsboro	0%	53%	0%	12%	29%	0%	0%	0%	0%	6%
Rockland	12%	47%	0%	12%	24%	0%	0%	6%	0%	0%
Portland	24%	38%	0%	10%	0%	14%	5%	0%	5%	5%
Portsmouth	18%	27%	0%	9%	0%	9%	18%	9%	9%	0%
Gloucester	0%	47%	0%	13%	7%	0%	0%	27%	7%	0%
Mystic	0%	36%	0%	9%	27%	0%	0%	18%	9%	0%
Boston	33%	33%	11%	0%	0%	0%	11%	0%	11%	0%
Hyannis	0%	38%	0%	25%	0%	0%	0%	0%	38%	0%
Fairhaven	20%	67%	0%	7%	0%	0%	0%	7%	0%	0%
Narragansett	18%	0%	9%	27%	9%	0%	0%	9%	9%	18%
Total	*13%*	*41%*	*1%*	*12%*	*10%*	*3%*	*3%*	*7%*	*7%*	*3%*

Composition comparison

	Acad	Com. Fish	Dlr	Ind. Rep	NGO	Public / Other	Rec. Fish	St/ Fed Mgr	St/ Fed Sci	Stdnt
Work-shops	13%	41%	1%	12%	10%	3%	3%	7%	7%	3%
Sample frame	2%	81%	5%	2%	3%	?	?	4%	3%	2%

Workshop outcomes

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Different sort of gig

Nothing on the table
Not a public hearing

Quality conversations

Wide breadth of ideas captured
Wide range of stakeholders attended

In general, northern and southern flanks most receptive

Some difficulty "playing along"

Generalizations

The need for change

- Little doubt, from all groups and geographies, about the need for change
- Much debate about type/quality of change

Complexity

- Wide range of opinions highlights the complexity of the system
- Incremental change necessary despite this complexity

Objectives

"What are the objectives for fishery management in New England?"

- 431 total comments received

- Used iterative binning approach (based loosely on logical framework analysis)

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- *"Create adaptive processes and structures"*
- *"Flexibility and adaptability of management to respond to system"*
- *"More flexibility in management rules and regulations"*
- *"Fresh fish-seafood quality"*
- *"Restore diversity in species and in nature of fisheries (consider multi-species fisheries) on local level"*
- *"Trophic balance"*
- *"Understand forage base and be sure management decisions protect it"*
- *"Maintain economic communities around fishing"*
- *"Consider coastal supply-side access"*
- *'Greater access-more opportunities in federal waters"*
- *"Many more participants in fisheries"*
- *"Consider economics - Encourage vessel downsizing without economic losses"*
- *"Lots of local boats"*

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Binned in numerous ways:

- **Validity as an objective**
  (405/431 valid)

- **Process vs. outcome orientation**
  (267 process-oriented, 137 outcome-oriented)

- **Iterative category binning:**
  - **Social, biological, governance =>**
  - ***Themes =>**
  - **Values =>**
  - **Actions**

1. **Delivering a quality product** *(9)*
2. **Diverse fishing opportunities** *(43)*
3. **Effective governance** *(183)*
4. **Healthy ecosystem** *(28)*
5. **Healthy fish stocks** *(20)*
6. **Healthy fishing communities** *(39)*
7. **Sound science** *(82)*

…further binned into "actions"

Value	# Actions
Delivering quality product to consumers	*1*
Diverse fishing opportunities	*5*
Effective governance	*10*
Healthy ecosystem	*4*
Healthy fish stocks	*3*
Healthy fishing communities	*6*
Sound science	*6*

1. Delivering quality product to consumers *(9)*

1) *Ensure high-quality seafood (9)*

2. Diverse fishing opportunities *(43)*

1) *Increase fishing opportunities/number of fisherman (14)*

2) *Provide for flexibility in fisheries and target species (17)*

3) *Encourage low-impact or reduced-impact fishing techniques (4)*

4) *Ensure recreational fishing opportunities (2)*

5) *Increase fishery sector employment (3)*

3. Effective governance *(183)*

1) *Stimulate stewardship, responsibility and participation amongst stakeholders (46)*
2) *Simplify regulations and slow the pace of regulatory change (12)*
3) *Increase transparency and accountability (21)*
4) *Incorporate area-based management approaches (18)*
5) *Use adaptive regulatory strategies and/or increase management flexibility (10)*
6) *Accommodate uncertainty in regulations (4)*
7) *Utilize broader management units (10)*
8) *Create mechanisms for addressing trade-offs (18)*
9) *Incorporate non-fishing uses of marine services (15)*
10) *Provide a positive net return on regulatory investment (3)*

4. Healthy ecosystem *(28)*

1) *Maintain or enhance biodiversity/ ecological balance (15)*

2) *Preserve or restore fish habitat (3)*

3) *Advocate for higher inshore water quality (6)*

4) *Minimize adverse impacts on the ecosystem (4)*

5. Healthy fish stocks *(20)*

1) *Protect spawning fish, spawn and juveniles (5)*

2) *Increase fish biomass (11)*

3) *Minimize bycatch (4)*

6. Healthy fishing communities (39)

1) *Ensure safety at sea (1)*
2) *Preserve cultural heritage (6)*
3) *Increase number and/or diversity of fishing businesses (7)*
4) *Ensure geographic diversity of fishing businesses and communities (11)*
5) *Ensure long-term fishery health and inter-generational equity (7)*
6) *Increase fishing business profits (5)*

7. Sound science *(82)*

1) *Incorporate fisherman's knowledge more thoroughly (11)*

2) *Increase emphasis on cooperative research (4)*

3) *Increase understanding of trophic dynamics/system-level processes (31)*

4) *Use all available scientific disciplines (10)*

5) *Improve sampling methodology and/or modeling methods (18)*

6) *Increase understanding of fish behavior and stock composition (4)*

Indicators

"What indicators can we use to know if we're meeting our objectives?"

- **231 distinct indicators**
- **Binned in similar fashion to objectives** *(validity, proc/out, value)*
- **Not matching indicators to actions**

Sample raw data

- *"Ability of fishermen to diversify"*
- *"Accident rates"*
- *"Age at maturity"*
- *"Age of fishermen"*
- *"Age structure of populations"*
- *"Changes in trophic structure"*
- *"Consistency of supply to market"*
- *"Early life history indices"*
- *"Economic benefits (incl. secondary) of comm fisheries"*

- *"Economic benefits (incl. secondary) of rec fisheries"*
- *"Emotional perspectives"*
- *"Markets--market disruptions"*
- *"Pollution"*
- *"Population age structure"*
- *"Quality of life--feeling that in charge of own destiny"*
- *"Safety index--insurance rates"*
- *"Species richness"*
- *"Vessel maintenance"*
- *"Weight-at-age"*

Binned:

- **Validity** *(215/231)*
- **Process** *(16)* **vs. outcome** *(191) - (24 unclas)*

Delivering a quality product   *(3)*

Diverse fishing opportunities   *(27)*

Effective governance   *(18)*

Healthy ecosystem   *(59)*

Healthy fish stocks   *(30)*

Healthy fishing communities   *(68)*

Sound science   *(10)*

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Comparison

Were the same values emphasized consistently when discussing objectives and indicators?

	All		Outcome-only	
	Obj	Ind	Obj	Ind
Quality product	2%	1%	5%	2%
Diverse fishing opps	11%	13%	26%	13%
Effective governance	45%	8%	18%	1%
Healthy ecosystem	7%	27%	15%	31%
Healthy fish stocks	5%	14%	11%	16%
Healthy fishing communities	10%	32%	25%	36%
Sound science	20%	5%	1%	1%

Matching tools to objectives

- **Generated tremendous interest**
- **Little consistency across workshops**
- **Poor results may be due to:**
  - **Inconsistency of presentation**
  - **Topic area too nebulous**
- **Specific comments may be of value to specific fisheries**

Delineating local ecosystem boundaries

- **Searching for non-traditional networks**

- **Inshore/offshore delineation**

  - **'Critical' to small-boats**

  - **'Abhorent' to big-boats**

  - **Small and large vessels present in same communities**

- **Ecological underpinnings of local ecosystem boundaries most heavily emphasized**

Capacity for local governance

- **Also little consistency across workshops**
- **Northern flank most receptive**
  - **Response may be positively correlated with latitude/longitude**
- **South of Portsmouth NH, little support for geographic definitions of community**
  - **Gear/fishery communities dominant**

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Survey
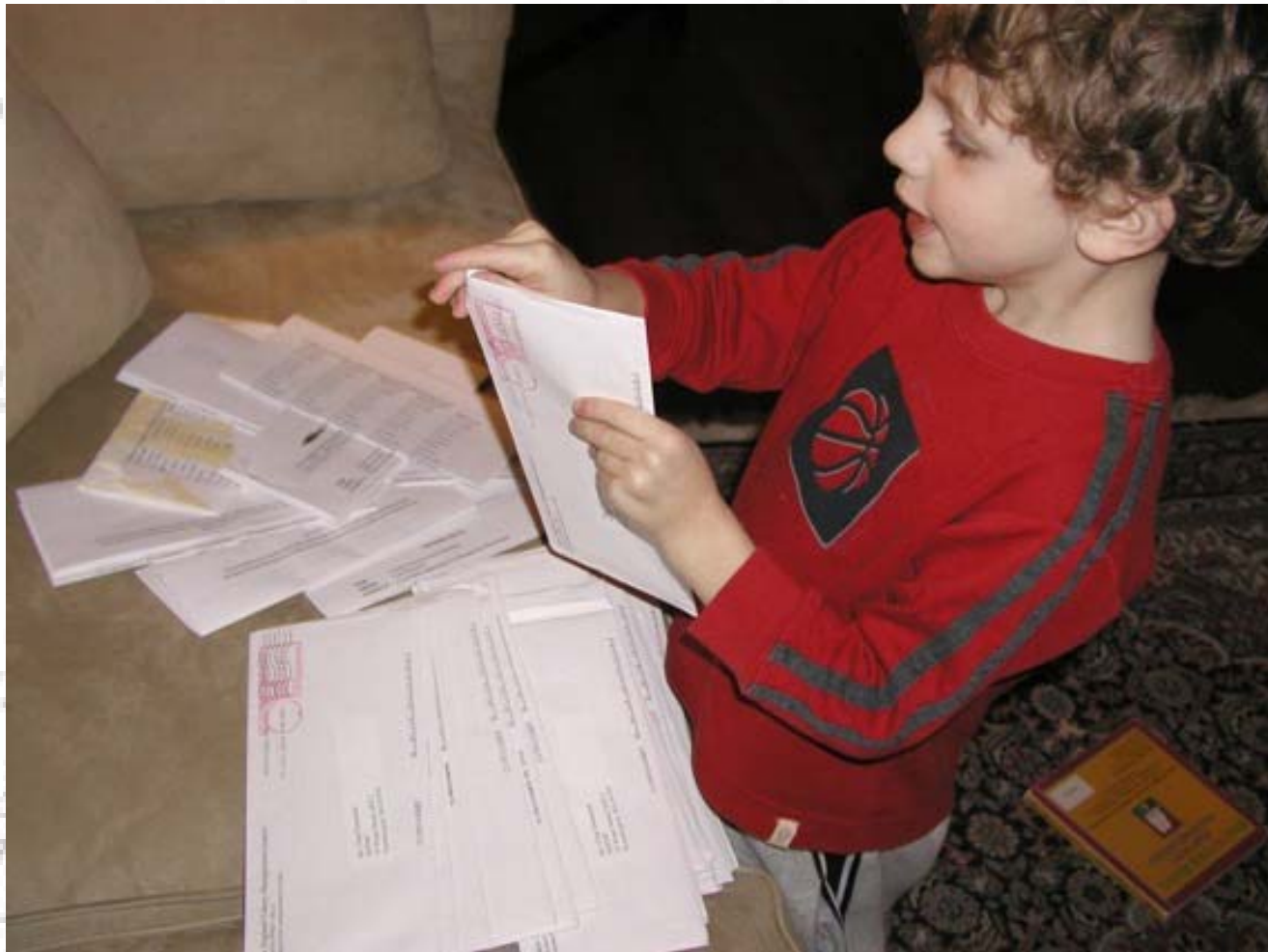
Some info

- **116 completed**
  - **85 at workshops**
  - **31 Council advisors**
- **Most from MA and ME (73%)**
- **25 of 28 disaggregated fishery sectors represented at least once**
- **Commercial vsl owners and industry rep's most heavily represented**

Selected results

Disaggregate data based on ID'd "relationship to the fishery"

Five categories:

1) Commercial Fishery – Wet
2) Commercial Fishery – Dry
3) Recreational Fishery
4) Academics/Management/Science
5) NGO/Consumer/Other

Group_1	Group_2	Group_3	Group_4	Group_5
Commercial Fishery, Wet	Commercial Fishery, Dry	Recreational Fishery	Academics/ Management / Science	NGO/ Consumer/ Other
56	35	27	33	37

Selected results

(6) How easy or difficult do you find participating in fisheries management decisions to be?

	Group_1	Group_2	Group_3	Group_4	Group_5
(a) Very Easy	7%	3%	18%	14%	9%
(b) Easy	11%	15%	41%	34%	21%
(c) Difficult	61%	59%	32%	41%	56%
(d) Very Difficult	20%	24%	9%	10%	15%
Did Not Respond =	2	1	5	4	3

(7) In your opinion, how effective is fisheries management in New England for ensuring the long-term health of the fisheries you are most directly involved with?

	Group_1	Group_2	Group_3	Group_4	Group_5
(a) Highly Effective	4%	0%	0%	0%	3%
(b) Effective	41%	52%	39%	55%	36%
(c) Ineffective	33%	39%	43%	35%	45%
(d) Highly Ineffective	22%	10%	17%	10%	15%
Did Not Respond =	5	4	4	2	4

(11) Rate the effectiveness of management tools as they are currently employed: *Results listed from lowest mean score (more effective) to highest mean score (less effective)*

Tool	Group_1 Mean	Group_1 Rank	Group_2 Mean	Group_2 Rank	Group_3 Mean	Group_3 Rank	Group_4 Mean	Group_4 Rank	Group_5 Mean	Group_5 Rank
DAS	2.216	5	2.345	7	2.409	8	2.560	14	2.731	15
Gear Restrictions	2.364	7	2.519	10	2.500	10	2.269	6	2.417	8
Landing Limits	2.667	13	2.643	14	2.500	11	2.524	11	2.667	14
Limited Entry	2.022	3	2.296	5	2.429	9	2.174	5	2.455	9
Mesh Size Limits	1.826	1	1.815	1	2.333	6	2.045	3	1.913	1
Minimum Size Limits	2.208	4	2.267	4	2.273	5	2.120	4	2.269	4
Possession Limits	2.750	15	2.586	13	2.591	13	2.571	15	2.583	12
Roller Gear Restrictions	2.535	10	2.192	3	2.100	3	2.360	7	2.480	10
Seasonal Closures	2.429	9	2.520	11	2.550	12	2.550	13	2.318	6
Slot Size Limits	2.341	6	2.321	6	2.050	2	1.880	2	2.115	2
Species Quotas	2.389	8	2.478	9	2.895	15	2.421	9	2.619	13
TACs	2.660	12	2.357	8	1.636	1	2.440	10	2.308	5
Trap Limits	1.897	2	2.042	2	2.190	4	2.364	8	2.130	3
Vessel size / power restrictions	2.578	11	2.538	12	2.850	14	2.545	12	2.522	11
Year Round Closures	2.667	14	2.783	15	2.368	7	1.864	1	2.391	7

Current vs. optimal use of tools

Two questions rated management tools (generically) on their effectiveness *(1) as currently used* **and** *(2) if used optimally*

Some respondents confused (rightfully)

Took a close look…

Current vs. optimal use of tools

60% of respondents provided different ratings for all 15 tools listed in both questions

12% of respondents answered both questions identically

> **The question was confusing**

> **They think all the tools are currently being employed ideally**

Current vs. optimal use of tools

Compared the mean responses to each question (*current* vs. *optimal*) for each tool

- Looking to find which tools respondents thought could be employed better than they currently are
- Answer depends on signif. threshold

	Year-round Closures	Limited Entry	Possession Limits	TACs	Gear Restrictions
Most strict threshold:					
Somewhat strict threshold:	All above, plus:	Slot-size Limits	Seasonal Closures		

Selected results

(14) In your opinion, are large-scale, year round area closures beneficial for fisherman?

	Group_1	Group_2	Group_3	Group_4	Group_5
(a) Yes	23%	26%	33%	31%	35%
(b) No	42%	35%	29%	24%	29%
(c) Not Sure	36%	39%	38%	45%	35%
Did Not Respond =	3	4	3	4	6

(15) Do you believe that preserving biodiversity contributes to a healthy commercial and/or recreational fishery?

	Group_1	Group_2	Group_3	Group_4	Group_5
(a) Yes	68%	55%	85%	91%	81%
(b) No	9%	6%	7%	6%	0%
(c) Not Sure	23%	39%	7%	3%	19%
Did Not Respond =	2	2	0	1	1

(19) In your opinion, are tradeoffs between inter-connected fisheries addressed adequately in New England fisheries management?

	Group_1	Group_2	Group_3	Group_4	Group_5
(a) Yes	4%	7%	5%	8%	3%
(b) No	81%	80%	86%	73%	76%
(c) Not Sure	15%	13%	10%	19%	21%
Did Not Respond =	9	5	6	7	4

Gross generalizations

Fishery stakeholders:

- Are very experienced (q. 1-4)
- Are active in their fishery 'community' (q. 2-2)
- Find it hard to participate in management (q. 2-6)
- Don't think management is good for the long-term health of the ecosystem (q. 2-8)
- Like the idea of area-based management (q. 2-9, 2-AP8)
- Don't think the horsepower/size restrictions work very well in theory or in practice (q. 2-10, 11)

Gross generalizations

Fishery stakeholders (con't):

- Prefer output controls for the groundfish fishery (q. 2-13)
- Think that preserving biodiversity contributes to a healthy fishery (q. 2-15)
- Believe that current fishery management practices negatively impact the ecosystem (q. 2-16)
- Believe that pollution is bad for the fisheries (q. 2-17)
- Fear non-visionary ecosystem-based management (q. 2-17) …*well, at least one…*

What have we learned?

Results of the stakeholder workshops and surveys are relevant to:

- Evaluation of current management
- Future changes in management
- Adoption of ecosystem approaches to management *(a tool, not a goal)*

Areas of potential improvement

1. **Stronger focus on area**
    a) Productivity – little disagreement
    b) Management objectives – some disagreement
    c) Governance – little agreement
2. **Must provide mechanisms for addressing inter- and intra-fishery trade-offs**
3. **Increased emphasis on non-fishing impacts (esp. pollution)**

How might management change?

- Shift from species-based to area-based management
- Explicitly set spatially-based objectives with a focus on stakeholder input
- Internalize costs and benefits of both fisheries and fisheries management
- Re-defining OY to incorporate fishery interactions
- Broader metrics for success, including indicators of ecosystem structure and function
- Longer time horizons, less individual actions
- Simpler regulatory structure
    - more flexibility for fisherman
    - greater margin of error for regulatory effectiveness

Towards an ecosystems approach

Essential questions:

- How do we define an ecosystem approach?
- How do we maximize involvement of our stakeholders?
- What is the appropriate spatial scale?
  - Management vs. monitoring
  - Objectives, indicators and tools
- What are appropriate management units?
- On what basis do we make objective decisions on inter- and intra-fishery tradeoffs?
- How do we improve accounting for cross-boundary and cross-jurisdiction impacts?

www.nefmc.org/ecosystems