Northeast Regional Cod Tagging Program

Annual Meeting: End of Year 2

Portland Regency, Portland, ME
8th – 9th December, 2004

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1. Overview

The Northeast Regional Cod Tagging Program (NRCTP) held it's second annual meeting on the 8th and 9th December, 2004. This two-day event enabled the program partners and a wider audience to learn of the substantial progress the Program has made since it's commencement in January 2003.

The meeting was well attended (see Annex 1 for a list of attendees) with Program partners only being present on Day 1, and a wider audience of 38 individuals participating in Day 2.

The agendas for each day are presented in Annex 2. Much ground was covered, both during the workshop format of Day 1 and the presentation/discussion format of Day 2. These minutes serve to summarize the key issues discussed over the two days.

Disclaimer: When dialogue or comments are included, these convey the general gist of what was said, not necessarily the exact words each individual used. These are accurate to the best of our ability.

2. Update on the NRCTP's progress by December 2004

On both days, each tagging organization presented a review of their progress to date. The format of these presentations varied greatly and the key points are presented here in this update of the Program's progress. GMRI's presentation began with a review of the Program's goals to provide context for the progress made.

2.1 NRCTP Goals

1) Identify the movement patterns of Atlantic cod throughout the Gulf of Maine and neighboring waters (Canadian Maritimes & southern New England)
    - Growth information
    - Spawning grounds
2) Develop a large-scale, collaborative cod tagging program;
    - Fishermen and scientists to tag ~100,000 Atlantic cod throughout the study area.
3) Make data available to the public:
    - Develop an online database with a GIS mapping interface for tracking tagged cod
    - Feedback of tagging information, e.g. recaptures
4) Identify future research questions

3. Progress summary

- The NRCTP has successfully developed and executed a large-scale, collaborative tagging initiative, with over 75 fishing vessels involved (64% commercial vessels and 36% recreational vessels). The total number of people involved is ~25 scientists and ~250 fishermen.
- Outreach efforts have continued at a consistent rate with information being distributed via: press releases; presentations at industry and scientific meetings; poster distributions (updated with high-reward tagging in June 2004); and mass-mailings. Three mass-mailings to ~5,000 individuals have been undertaken to date – the next is scheduled for January 2005.

- The NRCTP monthly lottery has resulted in 70 winners since it began in September 2003.
- The website (www.codresearch.org) has continued to be updated on a regular basis; an overview of website statistics was presented – the average number of visitors per month is ~32,000.
- The NRCTP Standardized Tagging Protocol has been updated to reflect any modifications to the tagging procedure; specifics include the introduction of high-reward tagging and the sampling of non-tagged cod.

3.1 Actions and modifications to the NRCTP.

Following is a summary of the actions which have been taken based on decisions made at past meetings; these decisions reflect the input of both program partners and recommendations made by NMFS personnel who have lent their expertise during past meetings.

	Year 1 6 Month Meeting	End of Year 1 Meeting	Year 2 6 Month Meeting
High-reward tagging		Y	
Tagging in inshore WGOM area		Y	
Data collection from non-tagged cod		Y	
Collect physical tags with returns		Y	
Encouragement of recreational collaboration			Y
Database refinements	Y	Y	Y
Outreach needs – reviewed & updated	Y	Y	Y
Contract progress reports: submitted jointly			Y

3.2 Tagging Progress by December 2004

Tagging has taken place in all areas outlined for tagging at the start of this program (Figure 1). The Western Gulf of Maine inshore region was added at the End of Year 1 Meeting in December 2003 and tags have been released in this area.

- The Program has met and will exceed it's target for tagging and releasing 100,000 cod in the Gulf of Maine region; the current total of cod tagged is ~103,551. Tagging information for each tagging organization is presented in Table 1.
- It has proved harder to locate the desired amounts of "taggable" cod in various Downeast Maine locations, some Maritime waters and also the more southerly location, Coxes Ledge. Other areas have proved extremely fruitful during specific windows of time (e.g. inshore Gulf of Maine and the closed areas of Georges Bank).
- The high-reward tagging program (recommended at the End of Year 1 Meeting) was brought into effect in May 2004; the aim was to release 10% of cod with high-reward tags, but the proportion of HR tags released to date is lower than 10% - program partners will continue to deploy HR tags throughout the remainder of the Program.
- By the 8th December 2004, ~63,000 of the tagged cod releases had been approved in the database; 1,122 recaptures had also been entered. Figure 2 presents the spatial distribution of these approved releases.

Figure 1: The Northeast Regional Cod Tagging Program's tagging locations; the Western Gulf of Maine inshore region was added at the End of Year 1 Meeting in December 2003.

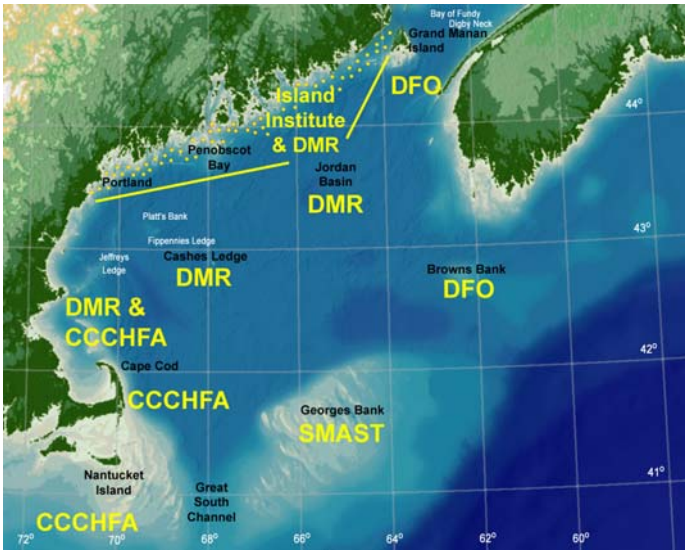
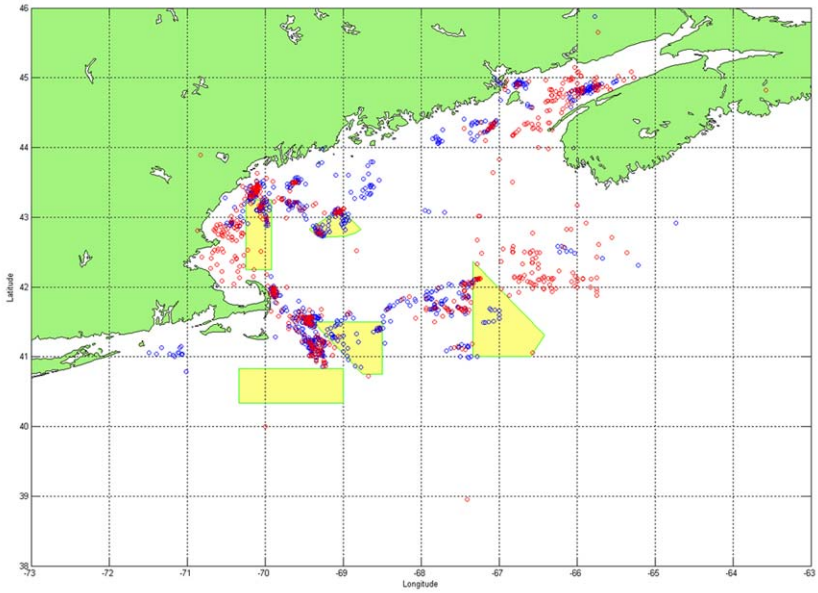


Table 1: Summary of tagged cod by tagging organization.

	Releases Mar-Dec 2003	Releases Jan-Nov 2004	Total
DFO	4,600	1,856	6,456
Island Institute	1,050	700	1,750
DMR	11,626	7,553	19,179
CCCHFA	21,809	3,5672	57,481
SMAST	7,920	10,765	18,685
Totals	**47,005**	**56,546**	**103,551**

Figure 2: The spatial distribution of tag releases (blue, n=63,518) and tag recaptures (red, n=1,122), as entered into the database by December 2004.



3.3 Data analysis

With tagging still underway and with the database not yet being fully populated, data analysis to date has been preliminary and has focused on: reporting rates, size relationships of tagged cod, growth rates, displacement (overall and seasonal), dispersal/exchange between areas. Only tag reporting rates will be presented in detail here.

Tag reporting rates:

- These are dependent on 1) fishermen's awareness of the program, 2) tag detection; 3) fishing effort; and 4) compliance to report tags and good recapture information (this varies greatly from individual to individual).
- The NRCTP has seen an increase in its tag return rate. This is reflected both in the number of returns per month (Figure 3) and the annual return rates of ~1.8% for Year 1 but 2.6% for Year 2 (Table 2).
- Considerable variation is seen between tagging organizations, which may be a factor of tagging effort relative to fishing effort, but also compliance of individuals in these areas to return tags, This is a recognized problem for this program, despite continued outreach efforts to encourage tag returns.
- Double-tagged (DT) cod, though reported at higher rates for DFO's releases, show only a slightly higher reporting rate (2.2% in 2003 and 2.7% in 2004) to the overall tag reporting rate (1.8% in 2003 and 2.6% in 2004).
- High-reward (HR) tags have been reported at a rate of 2.5% to date.
- The most used method for reporting tags is the mini-datasheet with the SAE – these accounted for 50% of Year 1's returns and 71% of Year 2's returns.
- Approximately 69% of tag returns have come from fishermen, with processors and observers reporting the remaining 31%.
- Canadians processors show greater willingness to report tags than US processors, but Canadians overall show little preference for reporting either orange DFO tags or the yellow NRCTP tags.

Figure 3: The number of tag returns per month shows an overall increase in tag returns.

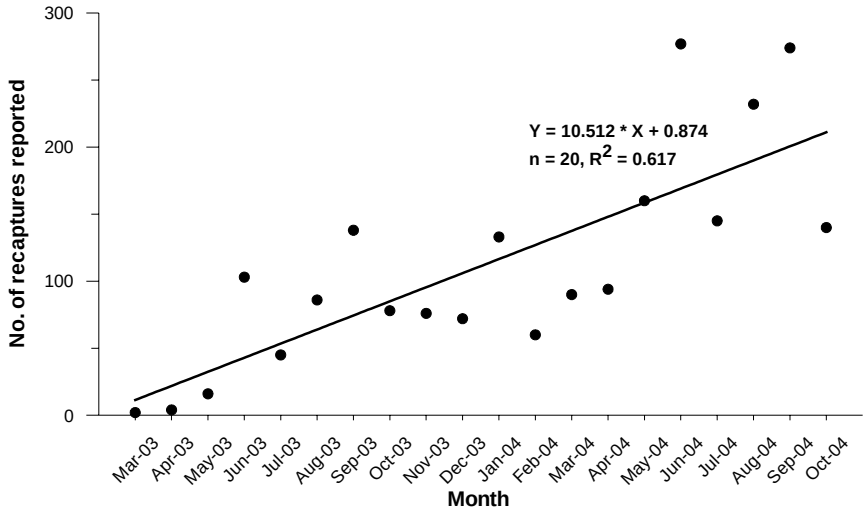


Table 2: Recaptures reported to date, relative to tagged cod releases; CF = commercial fishermen, RF = recreational fishermen, F = un-classified fishermen, P = processors and O = observers. Data for Year 2 does not represent a full tagging year; recapture data is for March – October 2004, compared with release data from March-November 2004.

	Releases Mar-Feb 2004	CF	RF	F	P	O	Totals	% of 2003 releases
DFO	4,600	42	0	2	142	2	**188**	4.1%
Isl. Inst.	1,050	0	3	8	1	1	**13**	1.2%
DMR	11,626	124	16	22	22	14	**198**	1.7%
CCCHFA	21,809	204	22	20	21	16	**283**	1.3%
SMAST	7,920	115	0	2	65	5	**187**	2.4%
Totals	**47,005**	**485**	**41**	**54**	**251**	**38**	**869**	**1.8%**

Double-tagged recaptures	n=103, =**~2.2%** of DT releases, =**11.9%** of total recaptures
Re-released recaptures	n=57, =**6.6%** of recaptures
No. physical tags collected	n=604, =**69.5%** of recaptures

	App. releases Mar-Nov 2004	CF	RF	F	P	O	Totals	% of 2004 releases
DFO	1,856	146	2	0	165	12	**325**	17.5%
Isl. Inst.	700	5	18	0	4	1	**28**	4.0%
DMR	7,553	172	61	5	34	47	**319**	4.2%
CCCHFA	3,5672	280	81	18	15	36	**430**	1.2%
SMAST	10,765	248	6	4	98	19	**375**	3.5%
Totals	**56,546**	**851**	**168**	**27**	**316**	**115**	**1477**	**2.6%**

Double-tagged recaptures	n=155, =**~2.7%** of DT releases, =**10.5%** of total recaptures
Re-released recaptures	n=47, =**3.2%** of recaptures
No. physical tags collected	n=1238, =**83.8%** of recaptures
High-reward recaptures	n=40, =**2.5%** of HR releases

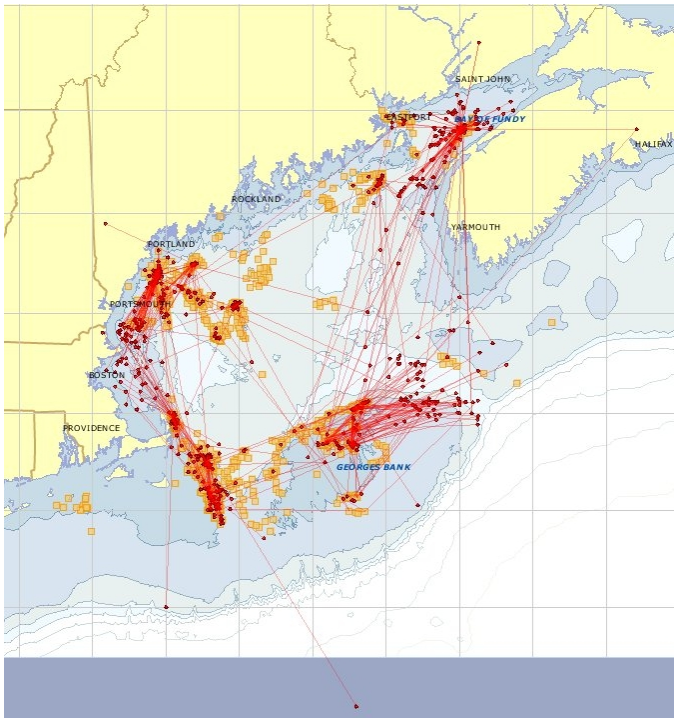
Other findings to date:

- **Size-relationships of tagged and recaptured fish:** Overall, cod tagged during trawl trips tend to be larger than those tagged during hook trips; the size range of cod tagged to date is 28-133cm. The mean size of released fish to date is 59cm (n=63,518) while the mean size at recapture is 71cm (n=1,087); the size difference seen may be indicative of growth, but may also be a factor of cod catchability at different sizes, recapture gear differences, and/or survivability of smaller tagged cod.
- **Time at large:** A large proportion of tagged cod (~30%) have been recaptured within 30 days of being released; some of these were recaptured during tagging trips. Of the remaining ~70%, time at large has ranged from 30 days to 300 days.
- **Displacement of tagged cod:** analysis to date shows a mean displacement of 41.9km, but this is likely skewed by the large proportion of recaptures (~30%) which have been caught less than 1 month after release. The maximum displacement recorded to date is ~475km.
- **Direction of travel:** Through the simple directional analysis of looking at how many fish to the east or west, and how many fish move north or south, recapture

data to date shows slightly higher westward and northward movements. An overview of tagged cod movements to date is shown in Figure 4. Future analysis will look for any seasonal effects in these movements.

- **Spawning cod:** From the approved data of ~63,000 tagged cod, relatively few spawning fish have been observed; spawning was noted in 612 releases and 6 recaptures by December 2004.
- **Tag loss:** Preliminary analysis by DFO indicates that 5.5% tag shedding rate; this is considered an acceptable level.

Figure 4: An overview of the movement indicated to date, from ~1,122 recaptures.



4. Program logistics

4.1 Data management

In November 2004, GMRI was able to recruit a new, full-time data technician (Sarah Whitford) whose primary responsibility is to error check and approve tagging release and recapture data. Within one month, Sarah had managed to approve ~13,000 tagged cod. GMRI is confident that it now has sufficient personnel to make good progress with the backlog of data (both releases and recaptures) over the next few months. A summary of the data entry status by early December is presented in Table 3.

Table 3: The current status of data entry and approval for tagged cod releases and recaptures. Another ~27,000 cod have been tagged but have not yet been entered into the database; this table does not account for these fish.

		Trips	Releases	Recaptures	
By Oct 04	Approved	~310	~50,000	~1,080	
By Dec 04	Entered, not submitted	14	1,305	2,378	(in Excel log)
	Submitted	71	12,311	n/a	
	Approved	443	63,518	1,088	(717 + 371 from tagging trips)
	Outstanding	**85**	**13,616**	**1,256**	

Phase III of the database enhancements is ongoing, but enhancements already activated in this phase include:

- Significant improvement of the recapture tool;
- Ability to categorize data at the time of data entry as "closed area" tagging;
- More flexibility and filterability for the flat-file database downloads;
- Non-tagged cod can now be entered as either "undersized" tagged cod (US0000) or "poor condition" cod (PC0000).

Future enhancements are likely to focus on data management improvements, but the online mapping interface will also feature a new, geographically extended map.

4.2 Mark-recapture workshop

This first Northeast Region Fish Mark-recapture Workshop was held in response to a need identified by NOAA Fisheries, Northeast Regional Science Center during the winter of 2003. It was felt that cooperative tagging programs in the northeast, which focus on a number of commercially important species, would benefit from a meeting aimed at reviewing the theory and analytical details of the modeling and analysis options currently available to tagging data. The aim of the workshop was as follows:

Goal:
- Provide a forum for reviewing the capabilities and limitations of available mark-recapture models in the context of ongoing or future tagging activities in the Northeast.

Objectives:
- Review state-of-the-art models available for testing mark-recapture project hypotheses.
- Review and critique three current mark-recapture projects in the Northeast (Atlantic cod, black sea bass and yellowtail founder) and provide advice on experimental design, field protocols, model selection, database development and ancillary parameters.

The Gulf of Maine Research Institute (GMRI) was contracted to coordinate and facilitate this meeting in collaboration with the NEFSC. A copy of the draft proceedings was circulated to program partners during this End of Year 2 Meeting (the final version is now available online at www.codresearch.org/WS_working_files.htm).

A detailed summary of workshop points relevant to cod tagging is provided in Annex 3, but the Program's implementations to date of specific recommendations made are presented in Table 4. Additional points discussed include:

- **Lottery procedure:** It was recommended that the Program consider revising its lottery procedures to categorize winners according to release location, rather than return location. The program partners were unanimous in their decision that this modification was not necessary and so will not be implemented.
- **100% double-tagging:** SMAST conveyed that the 100% double-tagging slows down the tagging procedure. It was, however, agreed that this modification would continue to be carried out for the remainder of the Program's tagging operations.
- It was proposed that if a regional/national tagging website is to be established, it should be hosted by a separate entity, not a partner or NMFS.

Table 4: Recommendations from the Northeast Region Fish Mark-recapture Workshop; seven out of ten of these recommendations had already been addressed by December 2004.

Recommendation	Date accomplished
100% double-tagging	Oct 04
Glove standardization - comments	Oct 04
Regional tagging page	Oct 04
Database – fate of fish	Nov 04
Access to historical data?	Nov 04 – being investigated
Test of outreach – HR tagging	Dec 04 - ongoing
Sub-standard data – rating	2005 ?
Database: Additional error checks	Winter 05 ?
Data analysis recommendations	Winter 05 ?

4.3 Contract management

Ken Beal from the Cooperative Research Partners Initiative (CRPI) was asked to update the group on tagging organization contracts and the status of contract extension requests, in addition to updating the partners on the long-term plans for the NRCTP. An additional subject addressed was the use of this Program's tagging data.

Contract extensions

Since all tagging organizations have a number of unused tagging days remaining (primarily caused by poor weather cancellations), tagging partners are interested in requesting no-cost contract extensions in order to complete their tagging operations. Ken Beal was confident that these extensions would be granted though the CRPI needs these requests to be submitted 30 days prior to an existing contract's end date; confirmation of approved extensions had not been received at the time of this meeting. The following no-cost contract extensions will be requested:

	Tagging days remaining	Extension end date requested
DFO	-	-
Island Institute	10	June 30th 2005
ME DMR	17	June 30th 2005
CCCHFA	?	March 30th 2005
SMAST	9	March 30th 2005

Long-term plans for the NRCTP

The overall long-term goals of the CRPI program was to fund three long-term studies (NRCTP, Study Fleet and Industry-based Survey), in a level-funded manner. [For the NRCTP this means a coordinating body (GMRI) and partner tagging organizations (DFO, Island Institute, DMR, CCCHFA, SMAST)]. It was reiterated that the NRCTP cannot continue to be funded at its current scale; there are not enough funds to support this structure long-term and not all goals outlined can necessarily be shared throughout the region and for the NRCTP's entire duration. This said, the following points were made:

- Support will be continued, but the funds available will be considerably less.
- Ken remarked that it would be good to see a Northeast regional tagging program funded, that would allow continued tagging on various NE species, as needed.
- It is unlikely that another cod tagging RFP will eventuate, but the CRPI will have a better idea after Christmas 2004 whether the NRCTP might be continued via contract amendments in future months.
- A draft CRPI 5 Year Cooperative Research Strategic Plan is being worked on; contributors include program partners, the Research Steering Committee and the CRPI.

Who can use the data, how and when

It was clarified that when a **grant** is awarded, the data belongs to the beneficiary (i.e. an individual applicant/organization), but when a **contract** is awarded, the beneficiary is the government. All partner organizations for the NRCTP are operating on contracts and as such, the data belongs to the government, though the goal is to share these data. The following specific points were made:

- Partner organizations have short-term (6-9 months?) proprietary rights to the data for publication, but long-term these data are the property of the government.
- A final report for the CRPI is due 90 days after contract completion, and this is the end product supported by the funding. This report should report on notable results, but is not the same type of product as a scientific publication.
- It is anticipated that partner organizations will collaborate for publications, but the CRPI is not responsible for supporting personnel for data analysis and writing of these publications.

A detailed discussion on access to data took place; the questions posed to CRPI are seen in Annex 4. Not all questions were answered, but it was decided to re-visit this issue, along with the subject of Publication and Authorship. Following are the key dialogue points which followed:

- **Ken Beal (CRPI):** NMFS and CRPI does not currently have a documented protocol on data use and publication rights for its programs, but a white paper is in progress.
- **Rodney Rountree (SMAST):** 90 days after the last tag is released is not long enough to have publishable data.
- **Richard Taylor (RSC):** How long do we hold the data? Can we merge our website with other tagging projects?
- **Shelly Tallack (GMRI):** At past meetings a ball-park figure of a 5-year holding period for data has been suggested, to enable people to be certain of its accuracy and therefore, quality. The current data is still really too young.
- **Don Clark (DFO):** We could release the data in time batches, e.g. Year 1 returns, then Year 2's returns, etc.
- **Laura Singer (GMRI):** We currently deliver the data to the public via an online mapping interface. How will the RSC react to this as being the means of sharing the data with the public for the foreseeable future?
- **Richard Taylor (RSC):** 99% of folk will be satisfied by that, they are wanting to see information, not raw data.

5. Realistic expectations of the NRCTP

On Day 2, as presentations began and reviewed the Program's original goals (see Section 2.1), the following were presented as realistic expectations of the Program, as determined by the original goals and experimental design:

- Provide region-wide, contemporary information on cod movements;
- Provide growth data to supplement those found through other growth studies;
- Provide data to supplement those used in stock assessments;
- High collaboration – industry & science, international;
- Ensure visibility and long-term public accessibility of data;
- Shed light on future research needs.

6. What questions can the data answer?

The types of questions which should be answerable include biological, stock and fishery questions, but this Program should also be able to answer some questions of relevance to designing future programs with similar aims.

6.1 Fishery/stock related

- How are identified movement patterns affected by: season and fish size (i.e. maturity)?
- What movement & exchange occurs between areas?
- Does the growth information from current tagging agree with that from other studies?

6.2 Of value to future experimental designs

- What catchability differences (tagging & recapture) exist between areas, gear type etc? Which gear is most suitable to the research goals?
- How does tag-induced survivability vary between handling technique, fishing method, tagger type?How do reporting rates vary throughout the region and what are the possible causes?

7. What can we expect for year 3?

GMRI is currently funded to maintain the infrastructure of the NRCTP for a third year. Specific roles include:

- Data management and database maintenance;
- Continued processing and rewarding of tag returns;
- Data analysis;
- Continued outreach and dissemination of findings;
- Report findings to date;
- Coordination of an End of year meeting for partner organizations and stakeholders.

7.1 Outreach needs

It was reiterated that outreach must continue throughout 2005 in order to encourage the continued return of tags.

- The monthly lottery will continue for as long as funds allow.
- Reward items will be distributed as funds permit; the type of reward item will be reviewed (currently T-shirts, hats and mugs).
- Mass-mailings will also continue.
- Bi-monthly updates will continue, though will likely change format and become quarterly.
- It is necessary to maintain the Program's outreach capacity at a local scale (i.e. within current partner organizations). To this end, Shelly will collate partner organizations' "frugal" financial estimates of 2005 personnel needs for continuing with outreach efforts within each region during 2005.
- One-on-one outreach is vital!

7.2 Data analysis needs

Ahead of the meeting, the following specific deliverables involving data analysis were identified:

- Reports to the CRPI/NMFS,
- End of year meeting and other data presentation opportunities (e.g. invitations to fishermen's meetings),
- 2006 mark-recapture/stock assessment workshop,
- Scientific publications.

Data analysis and publishing protocol

A example protocol on "Publication and Authorship" was distributed for review (see Annex 4). It was universally agreed that all program partners would be involved in publications, but that partners with advanced/relevant analysis skills would most likely undertake the analysis. In addition, NMFS and Woods Hole are likely to play a role in the long-term.

- During Year 3 the NRCTP should coordinate working data analysis meetings.
- The data management committee will develop a list of planned publications for the Program. In addition, this committee will provide a timeline for when these deliverables can be expected (i.e. what type of data is needed for each in terms of amount, number of years and quality, etc.). Specific dialogue on this matter included:

- **Rodney Rountree (SMAST):** Should we prioritize producing a "main" paper first, and then allow partners to branch off? Goals for the group should be to decide what papers will be produced, which can be worked on as a group and who will take the lead on each. Main papers should have all program partners' names; for other publications/uses, the author(s) should make sure all program partners are aware of their intentions.
- **Kevin Kelly (ME DMR):** Should we consider papers as "global" or "local" and then just involve the relevant organizations accordingly? If there is overlap, then multiple organizations could be involved.
- **Shelly Tallack (GMRI):** However we decide to do this, we need to develop a standard for people to follow.

Database needs

Additional database enhancement suggestions included:

- Develop a tool to generate recapture reports automatically.
- Add a keyboard shortcut for entering "additional tags".
- Add a place for "glove type".
- Develop an automated email tool for emailing the tagging vessel and recapture reporter when a recapture is approved.
- Additional error checks for: 1) when a recapture is smaller than the release, or 2) when the recapture occurred before the release.

Schedule for data analysis

The release of tagged cod should have ceased by July 2005 (pending CRPI contract extensions, see Contract extensions, page 10). Data entry and approval will continue throughout 2005 and all tag release data should have been entered, quality checked and approved within 2-3 months from when tagging stops. However, recapture data will continue to be reported for months/years to come, and as such, data entry of recapture data will continue well into 2006 and possibly beyond. The availability of tag release and recapture data will determine what analysis can take place. However, a tentative timeline for data analysis is as follows:

Analysis & model development	**Winter 05 onwards**
Testing and synthesis with historical data?	**Possibly Winter 05?**
Analysis with program partners	**2005/2006?**
Analysis with stock assessment teams	**2006 M-R workshop?**

7.3 Ancillary studies – moving forward

The potential ancillary studies identified during past meetings and prioritized during the Year 2 6-month update meeting were reviewed.

- It was agreed that data analysis in future months would help the group decide which of these studies would be most needed.
- It was further suggested that it would be good to get proposals in time for 2006 funding opportunities (short-term research RFPs) (Ken Beal, CRPI).
- Richard Taylor (RSC) suggested that the Program approach industry for a set-aside percentage to help support future ancillary studies.

8. Specific outreach questions asked of industry and scientists on Day 2

The meeting was a good opportunity to get input from industry on how the Program can improve its communications with industry and in turn, increase the tag return rate and the ultimate success of the Program. The following were particular questions asked:

- How do we keep the message strong if we are no longer tagging?
- How do we maintain interest and support?
- Will fishermen inform us of upcoming meetings which they feel it would be good to present at?
- How do we increase/improve tag returns?
- What types of reward items should we offer?

8.1 Feedback on types of outreach needed

- Getting articles into industry literature, e.g. *National Fisherman*, *Commercial Fisheries News* & *Portland Press Herald*;
- Advertise in local papers/magazines;
- Send out adverts via email to a national permit holder email list (if there is one);
- Outreach at port offices and processing plants (e.g. Fish Exchange).

8.2 Discussions specific to how we increase/improve tag returns

- **Bruce Kruczek (CCCHFA, FV Glory K):** Is there flexibility in tag rewards? Can we offer more (e.g. money) to gillnetters to get them to return the tags they tell us they have stashed? Maybe we can inform people about the higher return rate from Canada, maybe it will push them to return tags if it looks like all the fish are coming from Canada – they might want to show that the fish are in US waters too?
- **Rodney Rountree (SMAST):** It's hard to decide to pay money because we don't want to be treating different groups of fishermen differently?
- **Shelly Tallack (GMRI):** Even if we could offer money, how much would it take to make it any more worth their while than offering the T-shirt, hat or mug and lottery option? Is $1 a tag a realistic and worthwhile amount?
- **John Kenneway (CCCHFA, Fisherman):** Can we get the groups who don't return their tags together to get the word out, or try to understand why they aren't returning tags?
- **Bruce Kruczek (CCCHFA, FV Glory K):** Fishermen keep tags because they don't trust anyone, they think any information they turn over will be used against them, even if they think the Program's aims are essentially good. Some gillnetters think that this is a good Program, but don't want to show how many fish they are catching in case it leads to more regulations.
- **Steve Cadrin (NMFS):** We need grass-roots outreach, with fishermen who support this Program (and who are trusted by their colleagues) to go to the docks and talk to other fishermen about returning tags.
- **Terry Alexander (FV Jocka):** Do scientists distrust fishermen as much as fishermen distrust scientists?
- **Shelly Tallack (GMRI):** We would be naïve to think that every fishermen is cooperating fully with the Program; many are, but others don't and when one person doesn't it affects other people's inclinations to do so.
- **Steve Cadrin (NMFS):** We need to acknowledge that distrust is present.
- **Chris Moore (NMFS/CRPI):** We need to work on a unified message which tells people why it is important to know where cod are going and how this affects the fishermen - make it clear and concise.
- **Linda Mercer (ME DMR):** Present this information at the Fishermen's Forum. And make one display [a one-pager] that can be used in other programs'/organizations' mass-mailings.
- **Harry Mears (NMFS):** Keep the message simple. We're trying to learn about cod movement and migration. We have invested a lot and we need fishermen's help to understand what's going on – that's why we made this a collaborative project.

- **Loretta O'Brien (NMFS):** With regard to the bias in return rates so far, with Canadians returning more tags than Americans, we need to increase the US returns. Mass-mailings are important and we need to outline how the data will be used to show that it won't be used against them. Look at previous tagging studies and how they've used data; show how the data will be used to benefit the fishermen. Right now the data shows all US fish going to Canada because of the higher Canadian reporting rate – this should be an incentive for US fishermen to report tags to show that Canadian fish are coming to US waters too.
- **Don Clark (DFO):** Show what tagging studies are used for and that the data is not detrimental. That it can be used for stock assessments to help us know where the stock is moving. Bad data [too little, or false information] can hurt people in many ways and will not help anyone, while good data can only help people, if its used correctly.
- **Steve Cadrin (NMFS):** The data from this Program can be used in stock assessments only for movement, not for biomass estimates.
- **Shelly Tallack (GMRI):** How do we deal with fishermen who are invested in the Program, i.e. they tag fish for this Program, but who still don't return their tags, or do so, but with minimal information?
- **John Shusta (FV Special J):** End their contract – it should serve as a warning for other participating vessels.
- **Tom Rudolph (CCCHFA):** We have it in our contracts with our tagging vessels that they have to return information from tagged cod they recapture.
- **David Martins (SMAST):** To improve the actual quality of tag return data, we could standardize tag return envelopes across programs so that fishermen learn better what is needed of them; some use envelopes from different programs to report our tags so data gets omitted.
- **Shelly Tallack (GMRI):** This is a good idea though may be harder to actually bring into practice since different programs have different goals and therefore, data needs. We can't let these mini-datasheets get too complex.
- **Harry Mears (NMFS):** If the aim is to use data for management, this must be included in the experimental design. We need consistency in how data and information is delivered (e.g. tag return envelopes & mini-datasheets). What is the best way to collect/maintain an archive? It would be good to write up an "outreach package" which documents this Program's learning with regard to 1) how to get the word out, and 2) what works and what doesn't. This could be as a white paper but also as a website to help others.
- **Shelly Tallack (GMRI):** A regional tagging website would also be a good place to host this type of information, e.g. how to set up a tagging program, lessons learned etc.

8.3 Feedback on reward ideas

The current NRCTP tag return reward items are a T-shirt, cap or mug. In order to keep these rewards interesting and desirable, to encourage continued tag returns, GMRI requested new ideas for future reward items. Suggestions made include:

- Winter hat
- Light colored T-shirt
- Red cap
- Beer "cozies"
- Flashlight
- Frisbee
- Flags
- Bandana
- Bumper sticker
- Magnet
- Tension ball
- Gift certificate

9. Tasks for future months

Following are the general tasks for future months.

9.1 Key tasks for future months

- Outreach efforts will continue – greater effort by individual tagging organizations is again needed, particularly one-to-one outreach with fishermen.
- Tagging will continue (no-cost extensions to contracts permitting) until all budgeted vessel days have been used.
- Data entry and approval will continue.
- GMRI will focus on recapture data approval, thus enabling the production and distribution of recapture reports to people returning tags.
- Progress with data analysis.
- Further identification, planning and implementation of ancillary studies.

9.2 Post-meeting deliverables

In addition, the following needs were identified during this meeting:

Program logistics

- Ensure all no-cost extension requests are submitted to CRPI immediately after the meeting (Tagging organizations).
- Collate partner organizations' estimates of 2005 personnel needs for continuing with outreach efforts within each region; submit these estimates to CRPI (GMRI).

Data management and analysis

- Investigate the database enhancement suggestions; implement where possible (GMRI & Northern Geomantics).
- Coordinate working data analysis meetings during Year 3 (GMRI & Database management committee).
- Develop a list of what publications the NRCTP should aim to produce along with a timeline for these publications (Database management committee).
- Develop analysis tools, beginning during early 2005 (GMRI); collaborate with partner organizations on these.

Outreach

- Produce outreach materials with information specifically outlining why we need more tag returns (GMRI).
- Increase the number of outreach techniques; particularly focus on, e.g. articles (in *National Fisherman* etc.) (GMRI), advertisements (GMRI), one-on-one, etc. (Tagging organizations).
- A new reward item will be selected (from the suggestions made) and produced for distribution to people returning tags (GMRI).

Annex 1: Attendees of the NRCTP End of Year 2 Meeting

Name: Last, First	**Affiliation**	**Day**
Alexander, Terry	Maine Department of Marine Resources, FV Jocka	2
Ames, Ted	Penobscot East Resource Center, Stonington Fisheries Alliance	2
Annala, John	Gulf of Maine Research Institute	2
Beal, Ken	NMFS, Cooperative Research Partners Initiative	1 & 2
Cadrin, Steve	NOAA Fisheries Northeast Science Center, Woods Hole	2
Clark, Don	Canada Department of Fisheries and Oceans	1 & 2
Clark, Kirsten	Canada Department of Fisheries and Oceans	2
Duffy, Bill	Northern Geomantics	1 & 2
Eustace, Mary	Gulf of Maine Research Institute (and Maine DMR)	2
Fair, Jim	Cape Cod Commercial Hook Fishermen's Association	1 & 2
Foote, Pat	Gulf of Maine Research Institute	1 & 2
Gaudette, Julien	Gulf of Maine Research Institute	2
Grabowski, Jonathan	Gulf of Maine Research Institute	2
Groeger, Joachim	School for Marine Sciences and Technology, UMASS Dartmouth	1 & 2
Haley, Susan	Maine Department of Marine Resources	1 & 2
Jones, Darin	School for Marine Sciences and Technology, UMASS Dartmouth	1 & 2
Kelly, Kevin	Maine Department of Marine Resources	1 & 2
Love, Mike	Maine Department of Marine Resources, FV Titan	2
Martins, David	School for Marine Sciences and Technology, UMASS Dartmouth	1 & 2
McKay, Graham	Gulf of Maine Research Institute (and Maine DMR)	2
Mears, Harry	NMFS, Northeast Regional Office	1 & 2
Mercer, Linda	Maine Department of Marine Resources	2
Moore, Chris	NMFS, Mid-Atlantic Fisheries Council / CRPI	2
Morris, Gregg	Manomet Center for Conservation Sciences	1
Neal, Ben	Island Institute	1 & 2
O'Brien, Loretta	NOAA Fisheries Northeast Science Center, Woods Hole	2
O'Donnell, Kerrie	Maine Department of Marine Resources	1 & 2
Pike, Sarah	NMFS, Cooperative Research Partners Initiative	1 & 2
Rice, Curt	Maine Department of Marine Resources, FV Robert Michael	2
Rountree, Rodney	School for Marine Sciences and Technology, UMASS Dartmouth	1 & 2
Rudolph, Tom	Cape Cod Commercial Hook Fishermen's Association	1 & 2
Rule, Nola	Island Institute, FV Bigger n Better	2
Shusta, John	Island Institute, FV Bigger n Better	2
Sosik, Michael	Island Institute, FV Special J	2
Tallack, Shelly	Gulf of Maine Research Institute	1 & 2
Taylor, Richard	Research Steering Committee	1
Taylor Singer, Laura	Gulf of Maine Research Institute	1
Terceiro, Mark	NOAA Fisheries Northeast Science Center, Woods Hole	1 & 2
Whitford, Sarah	Gulf of Maine Research Institute	1 & 2
Kruczek, Bruce	Cape Cod Commercial Hook Fishermen's Association, FV Glory K	2
Yuknavich, Al	Cape Cod Commercial Hook Fishermen's Association, FV Surfbreaker	2
Barker, Tom	Cape Cod Commercial Hook Fishermen's Association, FV Zachary T	2
Kenneway, John	Cape Cod Commercial Hook Fishermen's Association, FV ?	2

Annex 2: Agendas for the NRCTP End of Year 2 Meeting.

Northeast Regional Cod Tagging Program: End of Year 2 Meeting

8-9th December, 2004 - Portland Regency Hotel, Portland, ME

AGENDA

Day 1	**9.00**	**Breakfast**
	9.30	**Introductions & agenda overview**
	9.45	**Presentations of progress to date:** • Area Updates (PIs from DFO, II, DMR, CCCHFA, SMAST) • Review of action points from previous meetings & Regional update (GMRI)
	11.15	**Break**
	11.30	**Program Logistics** • **Data management (GMRI)** - Data status (release and recapture) - Database enhancements review • **Mark-recapture workshop (GMRI)** - Review & recommendations - Actions taken to date • **Contract Management (CRPI)** - Contract updates - Extensions status (rollover of unused Year 2 days into Year 3) - Long-term plans for the Program (funding availability/potential needs identified at the tagging workshop) - Who can use the data, how and when (issues for QC and QA)? - Other questions/issues
	1.00	**Working Lunch – Group Photo** (weather permitting)
	2.00	**Year 3:** • Infrastructure & role of GMRI in 2005 • Personnel in tagging organizations? • **Outreach needs** - Are we getting the message out still? - How to maintain interest/support - Change to bi-monthly updates • **Data analysis needs** - Deliverables - Participants - Publishing protocol • **Ancillary studies – moving forward** - Review of potential IDed ancillary studies - How to move forward
	3.45	**Break**
	4.00	**Wrap-up and preparation for Day 2** based on Day 1's discussions • Summary of points discussed • Modifications to the Agenda for Day 2
	7.00	**Group dinner –** Flatbread Pizza, 72 Commercial St (772 8777)

Day 2	**8.00**	**Breakfast**
	8.30	**Introductions** • Welcome & Agenda presentation (GMRI) • Introduction of people present (All)
	8.45	**Presentations of progress to date:** • Review of program aims & background, action points from previous meetings & Regional update (GMRI) • Area Updates (PIs from DFO, II, DMR, CCCHFA, SMAST) • Q&A from stakeholders
	10.45	**Break**
	11.00	**Where are we after two years?** • **Data analysis (GMRI)** - Realistic expectations of this program in light of program goals - What questions can be answered by the data obtained? - Schedule for data analysis - Q&A from stakeholders • **Mark-recapture workshop (GMRI)** - Review & recommendations - Actions taken to date - Q&A from stakeholders
	1.00	**Lunch** (in The Atlantic Room)
	2.00	**Where do we hope to go in 2005 and beyond?** • **What can we expect for Year 3?** - Program infrastructure and goals for 2005 - Specific needs for Year 3 - Outreach needs - Q&A from stakeholders • **Update from the funders (CRPI)** - Long-term plans for the Program - Who can use the data, how and when? - Q&A from stakeholders
	3.45	**Break**
	4.00	**Summary/Wrap-up** • Summary of points discussed • Actions for future months
	4.30	**End**

Annex 3: Key points of relevance to the Northeast Regional Cod Tagging Program from the Northeast Region Fish Mark-recapture Workshop in Kennebunkport, ME (October 19-21, 2004).

Reporting rates:

- Need to be maximized;
- Heterogeneity in reporting rates is important for simplification of analysis;
- Recommended a review of rewarding techniques/options ($$, "trinkets" and lotteries);
- Failure to reward returns over a long period of time has a detrimental effect on returns for other/future programs;
- Consideration of a central clearing house for rewarding returns.

Experimental design:

- **Maximize the efficiency of resources** used, and ability to test specific hypotheses;
- **Two particular release strategies were IDed:**
    1) proportional to fishing effort,
    2) proportional to relative abundance;
- **Total cost of information from tags (double-tagging):** cost of the tag can be relatively minor compared to the costs of release, rewards and database management/maintenance;
- **Mission-appropriate tags:** specific movement hypotheses may be more efficiently tested using a few expensive tags (e.g. electronic tags) than a large number of conventional tags.

Database design and implementation:

- Important implications for **data entry** and efficient **data retrieval**;
- Need to be versatile to current and future un-IDed needs;
- **Cod tagging database** judged to be the most advanced, and a model for other programs;
- A cost-effective bridge between regional programs?
- Crucial elements = QA/QC, data visualization & data export functions for specialized software;
- Recognized as the primary tool for the tag reward program – needs to be able to provide timely feedback to those reporting tags and analysts.

Data analysis & model building:

- Specialized analytical models and visualization tools needed;
- Should be general enough to support different programs/designs and analytical needs;

- Multi-disciplinary: e.g. oceanography & wildlife management;
- High priority:
- Development of appropriate tools;
- Diagnostic methods for validation of model assumptions & fit.
- GIS has a role for visualization of data;
- Historical tagging data or simulated data could be used in model development;
- Stock assessments and inclusion of tagging information: develop procedural approaches & analytical methods for this.

Archiving information and data access:

- Long-term utility of tagging datasets is evident: raw data needed, not summaries;
- Long-term storage and availability of data is needed;
- If possible … recovery of historical tagging data;
- Need a standard regional policy reflecting professional ethics and courtesies for scientists without constraining timely access to data for management use;
- Need transparency, cooperation and critical review to:
- Improve the performance of all tagging programs;
- Provide justification for continued public funding of adaptive programs, focused on management needs.

General:

- Workshop benefited each tagging program through concurrent reviews: opportunity for peer review, feedback and refinement opportunities to meet goals set;
- Need for **future multi-species tagging workshops**:
- Collaborative, task-oriented working groups should be developed – focus on specific problems/issues;
- Tagging workshop geared towards integration of tagging data into stock assessments – 2006?
- Need for long-term commitment to tagging programs: 3 years minimum (provides a survival rate) - longer is recommended;
- Need for collaboration between programs – outreach, rewarding, common website etc.;
- Recommendation for a regional high-reward tag color.

Data collection additions:

- **Otoliths/scales** - Would have been ideal, but can use other synoptic ageing data – important for growth;**Genetic sampling** - Not recommended: late in program & thus, only marginal coverage likely; no genetic aims at outset; post-hoc design could impede genetic work;
- **Double-tagging** - Increase this rate to 100% of remaining tagging efforts – inexpensive additional information;

- **Spawning fish** - Don't need to change efforts to focus on these – see what you get as a bonus.

Tagging protocol:

- **Glove standardization** - Ideal from start in a study, but now write in comments what type is used, e.g. cotton, latex etc.

Database:

- **Fate of fish -** Released with tag, not just in comments;**Sub-standard data** - Rating?**Additional error checks** - Distance traveled? Fish length? Date (is this before release?).**Data analysis:**
- Gear selectivity for recaptures;
- Tag recapture sampling trips? Closed areas?
- Batch tag reporting – assess this further, RE quality of data;
- Reporting rate: more detailed investigation.

Outreach:

- Effectiveness – huge effort, but need to check whether it's working & reiterate this with program partners;
- Re-address incentives offered;
- Re-address lottery procedure, to prevent bias in tag reporting RE location;
- Website: increase # of links to other tagging programs (regional splash page);Test efficiency of outreach – random survey.

Data mapping site:

- Tag locator tool – increase amount of information requested when creating report

Specific Feedback requested:

1)	**Spatial distribution of tags:** design did not specify cap limits of how many tags to put where: rule of thumb ~5000.
Q	If analysis shows that the % of tags released in some areas is currently too low based on historical biomass estimates, should we focus our remaining tagging effort on these areas, or continue to tag throughout the areas?
A	Continue as you are – these areas can be weighted

2) **Tagging-induced mortality estimate:** so many variables for this program.

Q Most efficient means of obtaining this?

A Could do:

1) A small-scale, worse-case scenario cage study, or

2) Compare tag-recovery rate (proxy for survival) between different capture and release techniques and fish conditions

3) **Year 3:** currently funding is for infrastructure maintenance (database, returns, data analysis).

Q Discussions so far imply we need more tagging? What type? (Conventional, pulse, smart)?

A Funding dependent:

If long-term funding is likely - continue focused conventional tagging, incorporating a more rigorous release design….try to get a mortality estimate also.

If long-term funding is not likely - pause on tagging & do analysis - then decide what tagging is most appropriate - Smart tags not recommended yet owing to relatively low return rate

Annex 4: Example materials on Data access and usage and Publication and Authorship protocols.

Who can access/use the data?

Bearing in mind that "sharing of scientific findings, data and materials through publication is at the heart of scientific advancement," (Board of Life Sciences, 2003) this is in fact a difficult question due to the number of partners, data collectors and scientists involved with the NRCTP. Two particular documents have been considered for giving some insight into how we can approach this problem:

1) Sharing Publication-Related Data and Materials: Responsibilities of Authorship in the Life Sciences by Board on Life Sciences (2003) (found at http://books.nap.edu/catalog/10613.html).

2) NHMRC/AVCC **(**National Health and Medical Research Council (NHMRC)/Australian Vice Chancellors' Committee (AVCC)) Statement and Guidelines on Research Practice (found at http://www.nhmrc.gov.au/research/general/nhmrcavc.htm).

The first document provides information about authorship, while the second provides information regarding data sharing.

Particular questions we might want to consider:

1) Does our funding agency have a policy on how this data should be used/shared?
2) Who can use the data? How soon?
3) Publication & authorship.
4) If partners (or non-partners) use the data, what requirements do we need for rights to review the proposed publication? Should such review occur prior to submission for publication, or prior to publication after acceptance? (see Obligations in Exchange for materials received – (BLS, 2003).
5) Can the data be used as part of an individual PI's academic study (e.g. a Masters project?)
6) What is "public data"? At what point in the program does the data become fully accessible to the public, for downloading? After approval? Whose decision is this – the funding body?
7) When this data becomes fully accessible online – should we adopt a disclaimer of sorts? (See MBARI e.g.).

Publication and Authorship (whose name can be included)?

From NHMRC/AVCC (National Health and Medical Research Council (NHMRC)/Australian Vice Chancellor's Committee (AVCC)) Statement and Guidelines on Research Practice (found at http://www.nhmrc.gov.au/research/general/nhmrc.htm).

"Gift" authorships are not permitted. All authors must have contributed significantly to the science content. As a guide would-be authors should meet two of the following criteria:

- They conceived the idea and designed the experiment.
- They executed the experiment and did hands-on field work.
- They analysed and interpreted the data.
- They wrote all or made a substantial intellectual contribution to the manuscript.

The author should ensure that the list of authors fairly conforms to academic conventions on attribution of authorship. For guidance see the joint NHMRC/AVCC Statement and Guidelines on Research Practice (www.avcc.edu.au/news/public_statements/publications/glrespra.htm).

This statement from the Medical Research Council and the Australian Vice Chancellors is intended to guide institutions in developing their own procedures and guidelines, by providing a comprehensive framework of minimum acceptable standards.

On authorship it states at point 3.1 that:

> Authorship is substantial participation, where all the following conditions are met:
>
> a) conception and design, or analysis and interpretation of data; and
> b) drafting the article or revising it critically for important intellectual content; and
> c) final approval of the version to be published.
>
> Participation solely in the acquisition of funding or the collection of data does not justify authorship. General supervision of the research group is not sufficient for authorship. Any part of an article critical to its main conclusion must be the responsibility of at least one author. An author's role in a research output must be sufficient for that person to take public responsibility for at least that part of the output in that person's area of expertise. No person who is an author, consistent with this definition, must be excluded as an author without their permission in writing.

Data Sharing (Who can use the data?)

The *Sharing Publication-Related Data and Materials: Responsibilities of Authorship in the Life Sciences* by Board on Life Sciences (2003) provides much insight on the scientific community and how it views data sharing and ownership.

Of particular relevance to our database (due to its size primarily!):

Principle 2 from the *Sharing Publication-Related Data and Materials: Responsibilities of Authorship in the Life Sciences* by Board on Life Sciences (2003) states that "If central or integral information cannot be included in the publication for practical reasons (for example, because a dataset is too large), it should be made freely (without restriction on its use for research purposes and at no cost) and readily accessible through other means (for example, on-line). Moreover, when necessary to enable further research, integral information should be made available in a form that enables it to be manipulated, analyzed, and combined with other scientific data,"

Data published online:

Also, when the data is all approved, we may want to add a qualifier similar to what the Monterey Bay Aquarium Research Institute has at http://www.mbari.org/data :

Online Data Qualifier/disclaimer:

MBARI provides these data "as is", with no warranty, express or implied, of the data quality or consistency. It is provided without support and without obligation on the part of the Monterey Bay Aquarium Research Institute to assist in its use, correction, modification, or enhancement. For use in publication, authors should obtain written permission from MBARI's Director of Information and Technology Dissemination, acknowledge MBARI as the data source in those publications, and provide reprints to the MBARI library.