Overview of At-Sea Monitoring

ASM Program Design and Implementation

- Coverage rates 'good faith approximation' - *Susan*
  Tool to estimate coverage rates
- Vessel Selection - *Wendy*
- Provider/Sector/NEFSC responsibilities - *Wendy*
- Performance monitoring - *Wendy*

Discard Estimation

- Assumed discard rates
  Discard rate analysis – *Susan*
  Examples of discard estimation – *Susan & Mike*
- In-season methodology – *Dan*

Summary/questions: data flow - *all*

At-Sea Coverage

Good Faith Approximation of Sea Day Coverage

- Example 4 updated using sector rosters as of 6-19-09
- Expands on the small sample size issue
- Includes a 'tool' to estimate coverage rates to aid in the decision-making process
- Analysis is preliminary and advisory only

- Assumes fishing patterns will stay the same as the July 2007 to June 2008 period *(time period of data used).*
- Under sector management, fishing patterns are expected to change.
- When SBRM fleets are sub-divided by sector, some coverage may be too small. In these cases, use SBRM pilot coverage level.

At-Sea Coverage continued

Pilot coverage as defined in the SBRM Omnibus Amendment:

"Pilot coverage is defined as a minimum level of coverage to acquire bycatch information with which to calculate variance estimates that in turn can be use to further define the level of sampling needed. Based on Evaluating Bycatch: A National Approach to Standardized Bycatch Monitoring Programs (NMFS 2004), pilot coverage can range between 0.5 and 2%. In this study, 2% of the annual VTR trips for a fleet, with a minimum of 12 trips per year (3 trips per quarter) and a maximum of 400 trips per year (100 trips per quarter) was used for pilot coverage."

Taken from SBRM Omnibus Amendment (June 2007) page 134.

- Sector sea day coverage is consist with SBRM standards.

Example 4. Good faith approximation of sea day coverage for sectors (updated for workshop II)

Data from 2009 SBRM prioritization analysis utilizing NEFOP and VTR data from July 2007 to June 2008

1) Uses 2009 SBRM sea days needed to achieve a 30%CV, VTR sea days from all vessels, VTR sea days from sector vessels
MA = Mid-Atlantic (corresponding to statistical areas 600 - 639); NE= New England (corresponding to statistical areas in 500 - 562)
2) Calculate rescaling ratio (SBRM sea days divided by VTR sea days from all vessels)
3) Sum the product of the Sector's VTR sea day multiplied by the rescaling ratio over all SBRM fleets associated with A16 (Equation 4)
4) As a check, the non-sector vessels have been included to show that the totals add up.
5) Used updated Sector rosters as of June 19, 2009, re-calculated VTR sea days by sector and SBRM fleet

From SBRM sea day prioritization analysis				VTR sea days by sector (a_{hs}) and non-sector and SBRM fleet (f)								
SBRM fleet (f)	SBRM sea days (n_f)	VTR sea days (N_f)	Rescaling ratio (n_f/N_f)	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	Non-Sector vessels	Total
MA Longline	108	1,191	**0.0906**	0	0	0	0	0	0	0	1,191	1,191
NE Longline	456	1,508	**0.3024**	199	570	106	58	0	0	28	547	1,508
MA Large-mesh Trawl	1,459	11,531	**0.1265**	0	3,228	0	39	0	28	0	8,236	11,531
NE Large-mesh Trawl	1,233	27,836	**0.0443**	0	17,387	0	5,208	85	206	547	4,403	27,836
MA Large-mesh Gillnet	139	884	**0.1576**	0	6	0	0	0	0	0	878	884
NE Large-mesh Gillnet	187	9,324	**0.0200**	0	5,937	723	499	0	0	697	1,468	9,324
Total Days	3,582	52,274		199	27,128	829	5,804	85	234	1,272	16,723	52,274
If fishing patterns stay the same,												
Good faith approximation of sector sea days (SD_{hs})				60	1,471	47	263	4	13	47	1,678	3,582

Note: Along with the other caveats, in some cases, sample size may be untenably small

Sea days → costs ($)
Trips → analysis of sample size

Translate sea days into trips using mean trip length

6) To convert VTR sea days into trips, divide VTR sea days by weighted mean trip length

SBRM fleet (f)	wt mean trip length	VTR TRIPS by sector: Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	
MA Longline	9.0	0	0	0	0	0	0	0	
NE Longline	1.4	142	407	76	41	0	0	20	
MA Large-mesh Trawl	1.9	0	1,705	0	21	0	15	0	
NE Large-mesh Trawl	2.4	0	7,116	0	2,131	35	84	224	
MA Large-mesh Gillnet	1.1	0	6	0	0	0	0	0	
NE Large-mesh Gillnet	1.1	0	5,188	632	436	0	0	609	
Total Trips		142	14421	707	2629	35	99	853	TRIPS

7) Use 2009 rescaling ratio to calculate good faith approximation of sector trips

SBRM fleet (f)	Rescaling ratio (n/N_i)	If fishing patterns stay the same, Good faith approximation of sector TRIPS: Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	
MA Longline	**0.0906**	0	0	0	0	0	0	0	
NE Longline	**0.3024**	43	123	23	13	0	0	6	
MA Large-mesh Trawl	**0.1265**	0	216	0	3	0	2	0	
NE Large-mesh Trawl	**0.0443**	0	315	0	94	2	4	10	
MA Large-mesh Gillnet	**0.1576**	0	1	0	0	0	0	0	
NE Large-mesh Gillnet	**0.0200**	0	104	13	9	0	0	12	
Total Trips		43	759	36	118	2	6	28	TRIPS

In some cases, sample size (number of trips) is too small

Use SBRM pilot coverage standard of 2% of VTR trips (12 trip min and 400 trip max) when sample size is too small (< 12 trips)

Apply SBRM pilot coverage standard**
8) Assign SBRM pilot coverage when number of trips is greater than 0 and less than 12.

SBRM fleet (f)	If fishing patterns stay the same, Good faith approximation of TRIPS with SBRM minimum pilot coverage applied, by sector. If required number of annual trips is less than 12 and potential effort is greater than zero, then the expected number of trips must be equal to 2% of the trips (12 trip min and 400 trip max): Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Sector 7	
MA Longline	0	0	0	0	0	0	0	
NE Longline	43	123	23	13	0	0	12	
MA Large-mesh Trawl	0	216	0	12	0	12	0	
NE Large-mesh Trawl	0	315	0	94	12	12	12	
MA Large-mesh Gillnet	0	12	0	0	0	0	0	
NE Large-mesh Gillnet	0	104	13	12	0	0	12	
Total Trips	43	770	36	131	12	24	36	TRIPS
Sea Days	60	1,482	47	285	29	52	60	DAYS

Use mean trip length to translate trips into sea days

Under sector management, fishing patterns are expected to change: Sector rosters are not final, gear types and trip length may be different
The rescaling ratio, by region and gear type, can be used to determine at-sea monitoring coverage

Tool for At-Sea Monitoring Program coverage in FY2010

1) Enter expected mean trip length (days) and expected number of VTR trips in FY2010 for your sector

SBRM fleet (f)	wt mean trip length	VTR TRIPS
MA Longline	0.0	0
NE Longline	0.0	0
MA Large-mesh Trawl	0.0	0
NE Large-mesh Trawl	5.0	100
MA Large-mesh Gillnet	0.0	0
NE Large-mesh Gillnet	3.0	100
Total Trips		200 TRIPS

2) Use good faith re-scaling ratio by gear type and region

SBRM fleet (f)	Rescaling ratio (nf/Nf)	Good faith approx. coverage	Good faith approx. coverage with SBRM pilot coverage applied	
MA Longline	**0.0906**	0	0	
NE Longline	**0.3024**	0	0	
MA Large-mesh Trawl	**0.1265**	0	0	
NE Large-mesh Trawl	**0.0443**	4	12	
MA Large-mesh Gillnet	**0.1576**	0	0	
NE Large-mesh Gillnet	**0.0200**	2	12	
Total Trips		6	**24**	**TRIPS with an at-sea monitor, distributed throughout the year**
Sea Days		28	**96**	**DAYS with an at-sea monitor, distributed throughout the year**

* Northeast Seafood Coalition (NSC) has not partitioned their list into individual sectors as of June 19, 2009
**SBRM standards
http://www.nefmc.org/issues/sbrm/index.html
SBRM Omnibus Amendment Final, pages 157-169 and pages 206-209

Tool demo….

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  - Examples of discard estimation – *Susan & Mike*
- In-season methodology – *Dan*

Summary/questions: data flow - *all*

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Summary/questions: data flow - *all*

At-sea coverage and assumed discard rates

Outline of data for at-sea coverage and assumed discard rates
July 7, 2009

At-Sea Monitoring Program			Assumed Discard Rate	
	SBRM Omnibus Pilot Coverage Standard	**Good Faith Approximation**	**Fleet-wide**	**Sector-specific**
FY2010 At-Sea Monitoring Program is optional If selected: coverage will be maximum of SBRM Pilot Coverage or Good Faith Approx.	2% of trips (with minimum of 12 trips per year and maximum of 400 trips per year)	Use rescaling ratio (by gear type and region based on 2009 SBRM Sea Day Prioritization analysis using July 2007 to June 2008 data) and expected FY2010 sector activity	Use 2009 SBRM data set (July 2007 to June 2008); *Data Sufficiency*: Sample size minimum12 trips per year; use species-gear-region stratification to meet sample size criteria. Analysis conducted showing sampling sizes and discard rates	Use 2009 SBRM data set (July 2007 to June 2008); *Data Sufficiency*: Sample size minimum12 trips per year; use fleet-wide rates to meet sample size criteria Analysis conducted when sector rosters are final
FY2011 At-Sea Monitoring Program is optional If selected: coverage will be maximum of SBRM Pilot Coverage or Good Faith Approx.	2% of trips (with minimum of 12 trips per year and maximum of 400 trips per year)	Use rescaling ratio (by gear type and region based on 2010 SBRM Sea Day Prioritization analysis using July 2008 to June 2009 data) and expected FY2011 sector activity	Use 2010 SBRM data set (July 2008 to June 2009); *Data Sufficiency*: Sample size minimum12 trips per year; use species-gear-region stratification to meet sample size criteria	Use 2010 SBRM data set (July 2008 to June 2009); *Data Sufficiency*: Sample size minimum12 trips per year; use fleet-wide rates to meet sample size criteria. Other additional criteria may be needed.
Note: Coverage levels in FY 2011 and beyond may change to account for any bias determined in previous years				
FY2012 At-Sea Monitoring Program is mandatory	Coverage TBD (2011 SBRM Prioritization will include sectors)		Not Applicable in FY2012	

Assumed Discard Rates

- NMFS will calculate the assumed discard rates
- Sectors with no at-sea monitoring program will apply the assumed rates to calculate discards
- Assumed discard rates will be sector-specific for each stock and gear.
- If NMFS determines there are insufficient data to estimate discard rates at this fine a scale, the fleet-wide stock and gear discard rate would be used for those sector-gear combinations.

Discard Rate Analysis – Revised July 6, 2009 is in workshop materials

Table 2.

Fleet-wide

Species	Stock	Gear Type	Number of observed trips	Observed kept pounds of all species	Dealer kept pounds of all species	All data: Observed discard pounds of the stock	All data: Discard ratio	'Reduced' data: Observed discard pounds of the stock	'Reduced' data: Discard ratio	Trip limit effect
Cod	Georges Bank	Longline	61	290,338	3,940,450	6,245	0.03379	2,749	0.01442	2.34
		Otter Trawl	675	10,147,042	83,053,044	184,562	0.01816	123,981	0.01220	1.49
		Gillnet	58	64,183	28,696,849	3,735	0.05784	2,047	0.03179	1.82
	Gulf of Maine	Longline	35	35,991	644,061	6,194	0.21904	6,021	0.21089	1.04
		Otter Trawl	229	1,729,486	21,996,288	39,326	0.02415	23,005	0.01410	1.71
		Gillnet	103	392,115	14,832,374	4,659	0.01179	2,546	0.00653	1.81
Haddock	Georges Bank	Longline	60	266,076	1,906,194	13,404	0.05081	13,404	0.05081	1.00
		Otter Trawl	511	9,613,303	63,872,466	152,966	0.01593	152,416	0.01588	1.00
		Gillnet	46	57,933	8,076,707	37	0.00064	37	0.00064	1.00
	Gulf of Maine	Longline	35	35,991	644,061	305	0.01357	305	0.01357	1.00
		Otter Trawl	229	1,729,486	21,996,288	412	0.00021	412	0.00021	1.00
		Gillnet	103	392,115	14,832,374	150	0.00039	150	0.00039	1.00
Yellowtail Fld.	Georges Bank	Otter Trawl	340	5,931,278	24,523,684	138,410	0.02334	97,979	0.01652	1.41
		Gillnet	2	Information blocked due to confidentiality issues (< 3 trips).						
	Cape Cod/Gulf of Maine	Otter Trawl	419	4,303,586	40,517,634	22,878	0.00532	6,703	0.00153	3.48
		Gillnet	135	452,463	19,758,106	830	0.00200	416	0.00100	2.00
	Southern New England/ Mid-Atlantic (SNE)	Otter Trawl	311	1,745,697	40,680,849	5,846	0.00329	4,343	0.00241	1.36
		Gillnet	26	12,626	23,180,207	0	0.00000	0	0.00000	n/a
Winter Fld.	Georges Bank	Otter Trawl	340	5,931,278	24,523,684	5,930	0.00100	3,185	0.00054	1.86
		Gillnet	2	Information blocked due to confidentiality issues (< 3 trips).						
	Gulf of Maine	Otter Trawl	230	1,833,519	22,647,753	3,073	0.00163	3,073	0.00163	1.00
		Gillnet	104	404,787	14,919,133	29	0.00007	29	0.00007	1.00
	Southern New England/ Mid-Atlantic (SNE)	Otter Trawl	526	4,215,764	58,549,923	11,749	0.00263	8,807	0.00198	1.33
		Gillnet	57	60,301	28,019,180	96	0.00164	96	0.00164	1.00
Witch Fld.		Otter Trawl	840	11,980,561	105,701,604	16,694	0.00140	16,694	0.00140	1.00
		Gillnet	162	468,970	43,617,877	45	0.00010	45	0.00010	1.00
American Plaice		Otter Trawl	586	10,636,963	66,015,927	60,330	0.00569	60,330	0.00569	1.00
		Gillnet	135	443,672	20,621,061	130	0.00031	130	0.00031	1.00
Pollock		Longline	94	302,067	2,886,840	11	0.00004	11	0.00004	1.00
		Otter Trawl	804	11,792,828	95,657,464	2,748	0.00023	2,736	0.00023	1.00
		Gillnet	156	466,275	24,723,931	12,875	0.02842	12,875	0.02842	1.00
White Hake		Longline	95	326,329	4,451,978	333	0.00059	333	0.00059	1.00
		Otter Trawl	838	11,936,195	102,505,539	4,309	0.00036	4,309	0.00036	1.00
		Gillnet	160	468,193	40,172,672	475	0.00104	475	0.00104	1.00
Redfish		Longline	92	270,613	1,824,531	30	0.00006	30	0.00006	1.00
		Otter Trawl	586	10,740,996	66,667,392	38,217	0.00356	37,954	0.00354	1.01
		Gillnet	136	456,344	20,707,820	729	0.00165	729	0.00165	1.00
Wolffish		Longline	88	228,627	1,576,710	11	0.00003	11	0.00003	1.00
		Otter Trawl	575	10,431,096	65,423,537	440	0.00004	440	0.00004	1.00
A	B	C	D	E	F	G	H	I	J	K=H/J

When sector rosters are finalized, sector-specific discard rates will be calculated
Note: sample size of 12 trips are needed for data sufficiency

plus NSC's 13 sectors

Species	Stock	Gear Type	mesh	FLEET-WIDE Number of observed trips	FLEET-WIDE Reduced data Discard ratio	HOOK Number of observed trips	HOOK Reduced data Discard ratio	FIXED Number of observed trips	FIXED Reduced data Discard ratio	SHS Number of observed trips	SHS Reduced data Discard ratio	TRIBAL Number of observed trips	TRIBAL Reduced data Discard ratio	TRISTATE Number of observed trips	TRISTATE Reduced data Discard ratio	PORT CLYDE Number of observed trips	PORT CLYDE Reduced data Discard ratio
Cod	Georges Bank	Longline	all	61	0.01442												
		Otter Trawl	lg	675	0.01220												
		Gillnet	lg	58	0.03179												
	Gulf of Maine	Longline	all	35	0.21089												
		Otter Trawl	lg	229	0.01410												
		Gillnet	lg	103	0.00653												
Haddock	Georges Bank	Longline	all	60	0.05081												
		Otter Trawl	lg	511	0.01588												
		Gillnet	lg	46	0.00064												
	Gulf of Maine	Longline	all	35	0.01357												
		Otter Trawl	lg	229	0.00021												
		Gillnet	lg	103	0.00039												
Yellowtail Fld.	Georges Bank	Otter Trawl	lg	340	0.01652												
		Gillnet	lg	2													
	Cape Cod/Gulf of Maine	Otter Trawl	lg	419	0.00153												
		Gillnet	lg	135	0.00100												
	Southern New England/ Mid-Atlantic (SNE)	Otter Trawl	lg	311	0.00241												
		Gillnet	lg	26	0.00000												
Winter Fld.	Georges Bank	Otter Trawl	lg	340	0.00054												
		Gillnet	lg	2													
	Gulf of Maine	Otter Trawl	lg	230	0.00163												
		Gillnet	lg	104	0.00007												
	Southern New England/ Mid-Atlantic (SNE)	Otter Trawl	lg	526	0.00198												
		Gillnet	lg	57	0.00164												
Witch Fld.		Otter Trawl	lg	840	0.00140												
		Gillnet	lg	162	0.00010												
American Plaice		Otter Trawl	lg	586	0.00569												
		Gillnet	lg	135	0.00031												
Pollock		Longline	all	94	0.00004												
		Otter Trawl	lg	804	0.00023												
		Gillnet	lg	156	0.02842												
White Hake		Longline	all	95	0.00059												
		Otter Trawl	lg	838	0.00036												
		Gillnet	lg	160	0.00104												
Redfish		Longline	all	92	0.00006												
		Otter Trawl	lg	586	0.00354												
		Gillnet	lg	136	0.00165												
Wolffish		Longline	all	88	0.00003												
		Otter Trawl	lg	575	0.00004												

Quick review of Example 1 applying the assume discard rate

Example 1. Illustrates use of VTR and Dealer data, use of conversion factors and discard estimation using an assumed discard rate

For sectors with no at-sea monitoring program, stock discards will be calculated using an assumed discard rate

Trip used large-mesh otter trawl gear and fished in statistical area 515
Note: 1 subtrip

1) Uses VTR kept quantity, Dealer landings, and NMFS-provided conversion factors to convert landed weight to live weight.
Note: VTR are good faith hail weights, Dealer assumed to be exact.
2) Match VTR with all Dealer transactions for the trip, convert to live pounds, sum all species live lbs (K_i)

VTR			DEALER			NMFS	
Species AREA 515	Qty kept		Species*	Landed lbs.	Live lbs.	conversion factors**	
COD	210		COD	215	252	1.17	
HADD	325		HADD	320	365	1.14	
FLGS	125		FLGS	120	120	1	
FLDAB	230		FLDAB	235	235	1	
SKWINW	110		SKWINW	115	261	2.27	
CUSK	25	HC					HC = Home Consumption
LOB	75		LOB	75	75	1	
Total	1100			1080	**1307**		

3) Use the assumed discard rate (r_{ij}) from matrix for Large-mesh Otter Trawl for stocks corresponding to the area fished (i.e. stat area 515)
4) Equation 2 is used here

Stock	Assumed discard rate (r_{ij})	Dealer Kept all species Live lbs. (K_i)	Discard Live lbs. (D_{ij})
GB Cod	0.01940	0	0
GM Cod	0.01746	1307	23
GB Haddock	0.01222	0	0
GM Haddock	0.01422	1307	19
GB Yellowtail Fld.	0.01365	0	0
GM/CC Yellowtail Fld.	0.01565	1307	20
SNE/MA Yellowtail Fld.	0.01765	0	0
GB Winter Fld.	0.00184	0	0
GM/CC Winter Fld.	0.00164	1307	2
SNE/MA Winter Fld.	0.00194	0	0
Witch Fld.	0.00139	1307	2
Am. Plaice	0.00533	1307	7
Pollock	0.00024	1307	0
White Hake	0.00036	1307	0
Redfish	0.00334	1307	4
Wolffish	0.00004	1307	0

NMFS-provided assumed discard rate will be either sector-specific or fleet-wide

Note: Species/stocks that are not associated with the area fished have discards = 0
* Species are reported by species, market category, grade, unit of measure
** examples of conversion factors are given in worksheet '7-Examples of conv factors'

More on assumed discard rates with Mike's presentation

and then Dan's in-season discard estimation method

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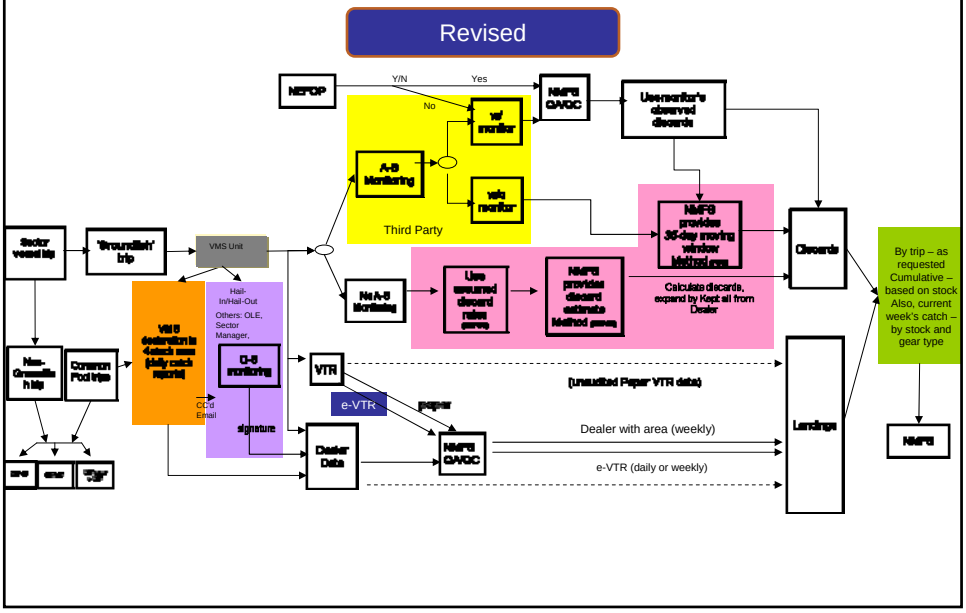
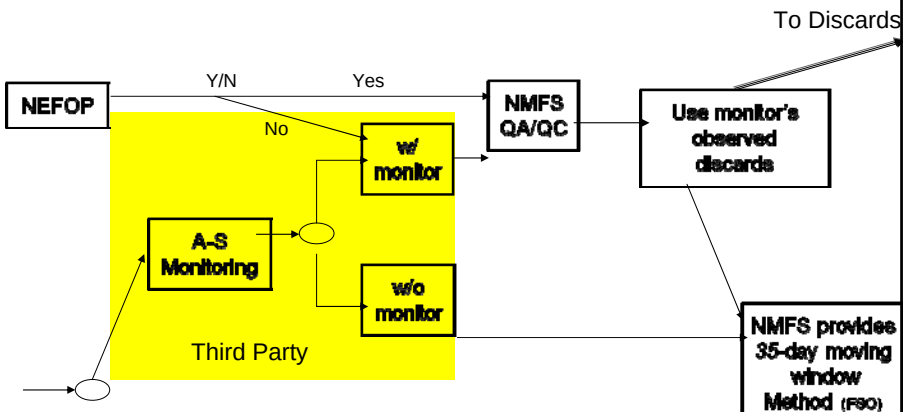
Summary/questions: data flow - *all*

Data Flow Process Map



Data Flow Process Map: Phase 2



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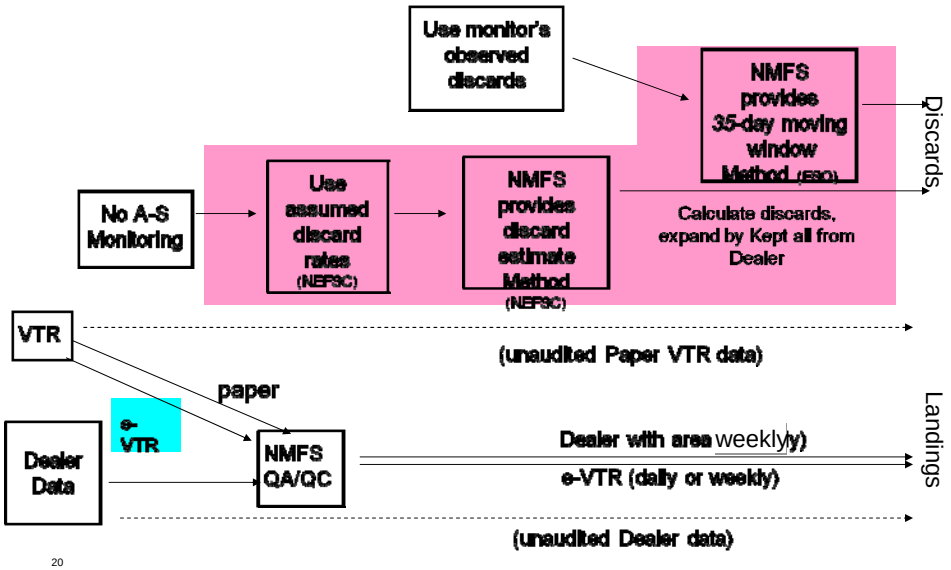
Data Flow Process Map: Phase 3



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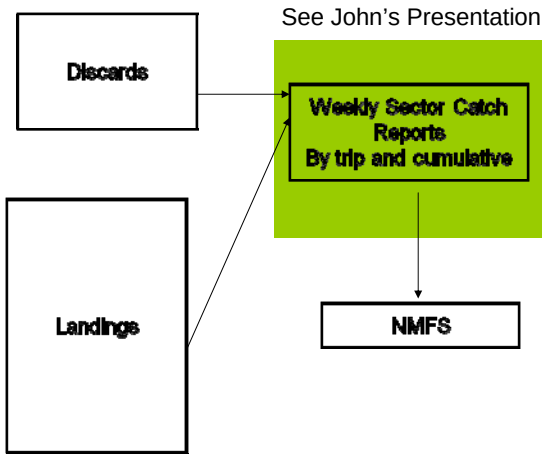
Data Flow Process Map: Phase 4



By trip – as requested
Cumulative – based on stock
Also, current week's catch – by stock and gear type

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