This package contains all the materials for the October 6th Harbor TMDL Oversight Group meeting. The meeting will take place at the EPA offices located at 290 Broadway, NYC in Room 24A from 10:00 – 3:00.

For those who can not participate in person, please call in to 866-299-3188 and use the code 2126373791#

The following nutrient related items can be found on the HEP website nutrients page. You may already have these. Please print them out if you wish to have copies for the meeting.

- HydroQual Tech Memo: Hudson River Flux Calculations and East River BOD (August 2010) **| PDF**
- Status of nutrient TMDL plan: Presentation (July 2010) **| PDF**
- Nutrient Loading Tables (July 2010) **| PDF**
- Progress on Completing a Dissolved Oxygen Management Plan/ TMDL for the NY/NJ Harbor (July 2010) *1.3 MB file, 192 pgs.* **| PDF**

Also attached are:

- **Draft trading paper (Attachment 1),**
- **Comments from NJDEP (Attachment 2) regarding the dissolved oxygen plan and the trading paper**
- **Comments from NYSDEC regarding the dissolved oxygen plan and the trading paper. (Attachment 3)**
- **Comments from Robin Miller on trading paper (Attachment 4)**
- **EPA's Assessment of TMDL status (Attachment 5)**
- **Economic Considerations paper (Attachment 6)**
- **Analysis of NYS vs EPA Marine DO**

Attachment 1

--- 8/3/2010 Draft ---
Flexibility in Establishing
Permit Limits Implementing
The NY/NJ Harbor Nutrient TMDLs

The parameters that will be regulated are carbon (measured as $CBOD_5$) and Total Nitrogen (measured as the sum of Organic Nitrogen, Ammonia, Nitrite and Nitrate). Carbon limits will be established as monthly average loading limits applicable during the period May 1 – November 30, the period when dissolved oxygen standards violations occur. Total nitrogen Limits will be established as twelve month rolling average loading limits; seasonal limits will not be used since there are significant time lags between Total Nitrogen discharges and dissolved oxygen responses.

TMDL allocations will be established by management zone for both carbon and nitrogen loadings. These allocations will be further broken out by state and by source category. As a fundamental principle, EPA and the states wish to maximize flexibility in establishing individual permit requirements implementing the TMDLs. The Plan and its allocations is the datum from which all alternative plans will be measured. Any lower cost, equitable alternative plan that produces a dissolved oxygen response that is equal to or better than the Plan will be preferred.

The first step in identifying a preferred, cost-effective, equitable alternative plan is for a permittee, or group of permittees to propose an alternative set of actions for one or more management zones that has a reasonable prospect to produce a dissolved oxygen response that is equal to or better than that produced by the Plan. As a first cut guide in formulating alternatives, permittees should assume:

- The ability to trade pound for pound between discharges of carbon within a zone;
- The ability to trade pound for pound between discharges of nitrogen within a zone;
- The ability to trade carbon and nitrogen loadings for a single discharge, or between discharges within a zone in accordance with par values that vary by zone;
- Limited ability to trade among zones based on more sophisticated analyses.

Alternatives will be evaluated by the involved state(s) in consultation with EPA. Plausible alternatives will proceed to a second step in the evaluation process --- a confirmatory model run paid for by the permittee(s). Alternatives that produce a dissolved oxygen response that is equal to or better than the response produced by the Plan will be approved, and incorporated, for informational purposes in an update of the approved TMDL. Alternatives that fail this test may be adjusted through an iterative process to meet the requirements for approval.

Attachment 2

NJDEP Comments on:

1) Progress as of June 25, 2010 on Completing a Dissolved Oxygen Management Plan/TMDL for the NY/NJ Harbor

2) Flexibility in Establishing Permit Limits Implementing the NY/NJ Harbor Nutrient TMDLs

The New Jersey Department of Environmental Protection (Department) provides the following comments on the referenced reports and identifies additional information needed to move forward with both the nutrient and pathogen water quality studies.

Progress as of June 25, 2010 on Completing a Dissolved Oxygen Management Plan/TMDL for the NY/NJ Harbor

The current NY/NJ Harbor nutrient reduction plan outlines a Revised-Sub Regional Plan (RSRP), which can be viewed as the initial proposal for a TMDL for the harbor and its tributary waters. The Nutrient Reductions Cost Estimation Study previously prepared by Metcalf & Eddy, Inc. on behalf of the NJHDG estimates the costs for attaining various levels of reduction. In prior meetings, there appeared to be agreement that selection of the RSRP components should consider the costs relative to the incremental improvement in attaining water quality standards.

The Department conducted an evaluation of the Baseline, Revised Plan Improvements (RPI) and the RSRP simulations based on Attachment 5 (Sub-Regional Volume Weighted Days of Non-Attainment NY Chronic Standards) and compiled a summary in Table 1 below. The reductions to achieve the RSRP results are summarized in Table 2 below. The costs, taken from the Metcalf and Eddy, Inc. report, for the RSRP reductions are summarized in Table 3 below.

The Department recognizes that the "volume weighted days of non-attainment" summary does not reflect the actual number of days during which some level of violation occurs in one or more grid cells. Nevertheless, this depiction does provide a sense of the relative improvement and the cost associated with the nutrient removal required to achieve a given relative level of attainment. It is also recognized that if a decision is made to decrease the level of reduction in one management zone, it could have ramifications in another management zone. To enhance understanding of non-attainment results, the Department recommends that Attachment 3 (Days of Non-Attainment Tabulations) should be presented in a more user friendly format so it can be used in conjunction with the volume weighted days of non-attainment depicted in the bar charts (at a minimum, overlay the management

zone spatial extent on the grids so the spatial extent of the days of non-attainment can be readily matched with the volume weighted days of non-attainment by management zone).

Hudson River, Upper Bay

As Table 1 shows, a modest improvement may result for the additional nutrient removal based on the RSRP for the Hudson River / Upper Bay regions, but at a very substantial cost. It may be appropriate at this time to consider the feasibility of implementing the RSRP using the cost criterion.

In addition, the Department believes that in order to provide a more realistic evaluation, simulating using existing effluent quality and flow should be incorporated in the analysis. For example, as Table 4 shows, the existing effluent quality may differ significantly from the baseline condition, e.g., see PVSC's BOD effluent quality. It is recognized that, ultimately, unless the existing quality achieves better effluent quality than the RSRP, the reductions based on the RSRP will be applicable. However, a model simulation showing the existing condition will be very helpful when presenting this TMDL to the public. Note, the RPI also does not reflect the existing conditions.

Passaic and Raritan

Under the RSRP, it is assumed that inputs from the Passaic and Raritan Rivers will be maintained at existing levels. The Department has indicated in the past and states again that this approach is problematic because these areas are targeted for significant additional development and, accordingly, existing treatment facilities have permitted, but unutilized, capacity that would result in additional loads of the C and N. In addition, this assumption would translate into permit limits that would cap existing loads from some 70 STPs discharging to the rivers, the feasibility and cost of which has not been assessed. Further, based on the volume weighted days of non-attainment analysis, this premise, along with the reduction strategies identified for these waters, do not appear to be warranted. A final concern is the suggestion by EPA that the states should proceed with permit modifications that would include effluent limits capping existing loads, in advance of completing the water quality study/TMDL and associated public input process. EPA had agreed to provide information that pointed to the legal authority to proceed in this direction, but has not yet done so. A more detailed discussion of each area follows:

Non-Tidal Passaic River above Dundee Dam: The Non-Tidal Passaic River Basin Phosphorus TMDL was developed using WASP7 and data from water years 2000 through 2003. The SWEM model uses the TMDL model outputs as follows: the simulated monthly median in-stream concentrations under the TMDL conditions for phosphorus, carbon and dissolved oxygen concentration just upstream of Dundee Dam are taken as head of tide concentrations and applied to the 1988/1989 hydrology upon which the SWEM model is based. Nitrogen concentrations are based on in-stream measurements and are not adjusted based on model simulations.

The rationale for not using the Passaic TMDL simulated nitrogen concentrations is justified due to the fact that the TMDL simulated concentrations were based on the dischargers' 90th percentile or permitted effluent concentrations at permitted flow, which would produce an overly high value as the input to the harbor. However, requiring loads to be capped appears to be excessively restrictive. HydroQual conducted a sensitivity analysis relative to Dundee Dam nitrogen loading assumptions for planned improvements in August, 2008; in this study, HydroQual stated the following: "Results obtained by HydroQual show that depending on the nitrogen concentrations assigned at Dundee Dam in SWEM, nitrogen concentrations in the Lower Passaic River will differ; however, there is no discernible difference in phytoplankton biomass and dissolved oxygen concentrations in the Lower Passaic River. Raising nitrogen concentrations in the Lower Passaic River does not negatively impact phytoplankton or dissolved oxygen within the Lower Passaic River because there is already more nitrogen present in the Lower Passaic River than the phytoplankton can use under existing light/ residence time/ temperature conditions."

The study further stated " …it is HydroQual's recommendation that for planned on-going modeling work supporting Harbor TMDL development, the nitrogen concentrations specified at Dundee continue to be based on measurements, not results of the Non-Tidal Passaic River model. This recommendation does not preclude EPA or the States from requesting SWEM simulations in the future for TMDL purposes that consider permit level loading consequences for STPs within or outside the HEP core area."

Non-Tidal Raritan River above Fieldville Dam: SWEM boundary loading assumptions from the non-tidal Raritan River Basin were similar to the approach taken for the non-tidal Passaic River. A key difference is that nitrogen concentrations simulated under the Raritan TMDL condition used the dischargers' permitted flow and "existing effluent nitrogen concentrations" rather than 90th percentile effluent nitrogen concentration.

Consequences:

1) In terms of the latest model runs, the Passaic River shows a small degree of non-attainment under RPI (7.17 (1988) and 2.01 (1989) days), which is improved to 0.92 or 0 days of non-attainment under the RSRP. The RSRP for this management zone calls for LOT C and N for CSOs and SW. Based on the cost for LOT CSO/SW improvements alone, this degree of improvement may not be justifiable and becomes less so when factoring in the cost implications for upstream users in maintaining existing N loads at the Dundee Dam. A concern in this region, as well as all that call for LOT CSO/SW is the following. The LOT load reductions are based on manufacturers' claims regarding N and C reductions, which have not undergone and independent verification process. The Department is concerned that calling for LOT that has a specific load reduction would lead to permit limits that call for such numeric reductions. If the LOT measures do not actually achieve those levels, will the CSO entities be held responsible for achieving the numeric limits, upon which the TMDL was based? Or, alternatively, would the CSO entities be subject to a technology based limit that achieves what it achieves, even if it is not the level needed to obtain the simulated result? This point is critical, as the Department has assumed that the focus of CSO abatement would be for pathogen results, with C and N improvement being an ancillary, unspecified benefit.

It has been suggested previously that runs assuming a smaller level of reduction in terms of C and N (10% and 20%, respectively) would be informative, but these have not yet been done. As part of the plan selection, it is important to analyze the cost effectiveness of assigned load reductions to various sources.

2) Raritan Bay is another area where a very small degree of non-attainment occurs under RPI (0.34 or 3.07 days) which is further reduced under RSRP (0.07 or 1.1 days). Raritan River does show a greater degree of non-attainment under RPI (5.74 or 12.17 days) that improves to 0 days under RSRP. Raritan River is lumped with Raritan Bay in terms of what improvements are required to achieve these improvements, which is LOT for C and N for CSO and SW, as well as LOT for N at MCUA. The cost of attaining the small degree of incremental improvement in the harbor waters from the direct sources alone does not appear to be justified. Further, the degree of non-attainment presented does not appear to justify a decision to cap Raritan River loads at existing levels, given the cost of N removal for direct sources as well as upstream dischargers. It would seem that the time is now to assess the cost in terms of the affordability criteria. Given the complexities associated with the number of dischargers and municipalities affected, EPA's assistance in applying these criteria is requested.

3) By using an in-stream concentration not linked to the river models that allow prediction of same based on changing loads in the tributary waters, implementation of the resultant WLAs through NJPDES permitting will be costly (unnecessarily so given the availability of river models that cost millions to develop), time consuming and technically challenging. Any increase in flow, even within permitted flow, at any of the treatment plants within the affected non-tidal Passaic and Raritan area would require upgrades in treatment to maintain existing loads or a water quality study to demonstrate that there would be no concentration change at the boundary.

Recommendation:

It was stated at the last Oversight meeting that a run using permitted loads from the Passaic and Raritan resulted in significant non-attainment in harbor waters. This does not seem to track with the sensitivity analysis done for the Passaic. Demonstration of this stated result is a necessary first step. Additional runs are proposed that would identify the maximum load increase that can be absorbed with minimal impact on the harbor waters. The results of such runs are essential to show that the cost of required upgrades bear a reasonable relationship to the water quality improvement that will be obtained.

The first model run would be based on simulation of existing effluent quality (using the Passaic and Raritan TMDLs WASP model) discharging at permitted effluent flow and average effluent concentrations. WASP model simulations will be made available to HydroQual for this purpose. SWEM simulations would be performed by using WASP outputs for flow and concentration time series. The objective would be to develop relationships from the WASP outputs such that concentrations could be expressed as functions of flow and these would be passed to SWEM, in place of WASP outputted concentrations. If such relationships between concentrations and flows exist, mismatches in

hydrodynamic conditions between the freshwater WASP models and SWEM, as occurs under the current RSRP, would be eliminated.

Applying this recommended approach in determining the final allowable load at the SWEM boundaries would lead to

- a more scientifically sound outcome that addresses hydrologic disparities;
- a defensible outcome that aligns upgrades required with tangible environmental benefit that also accounts for realistic future conditions;
- a more straightforward implementation plan that will use robust linkages between the Harbor SWEM model and the two river TMDL models.

It should be noted that there are about seventy WWTPs located in the Non-tidal Passaic and Raritan Rivers that will be impacted by the current load assumptions at the boundaries. Using the Passaic and Raritan models will allow testing for the maximum load the upstream plants could deliver and still achieve the downstream water objectives. Further, it would allow consideration of alternatives to achieve the boundary targets, e.g. assumptions regarding nonpoint source load reductions.

Flexibility in Establishing Permit Limits Implementing the NY/NJ Harbor Nutrient TMDLs

The Department supports the use of seasonal limits for carbon in the final TMDL limits, and requests justification using model simulations for the assumed year round nitrogen reductions. It is understood that this draft fact sheet is applicable only to areas where "C&N LOW N" are called for. It is noted that the paper contained a very brief summary that does not explore the complexities of attempting to implement a trading project.

Pathogen TMDL Shellfish target:

One of the action items with regard to a shellfish harvest driven endpoint for this water quality study was to provide a relative contribution of sources per grid cell in areas where unrestricted shellfish harvest restoration is sought. There has been coordination on this issue between HydroQual and NJ representatives and we await this information. However, an additional concern is the effect of the numerous wet weather bypasses of sanitary sewage infrastructure in New York. Under the simulations, which necessarily assume a zero discharge from unpermitted discharges, a substantial reduction from permitted discharges is required. If the reality is that the unpermitted discharge impact would continue to occur, (or even increase as a result of the strategies employed by NY to reduce/eliminate CSOs) thereby causing shellfish use to be impaired, then the expense of implementing the reductions called for in the plan will be in vain (unless they are the same as are ultimately required for the nutrient TMDL). There are two questions that arise: 1) can the SWEM model quantify the relative significance of the loading from bypasses using information from past occurrences for both the baseline and the future simulations; and 2) what measures are contained in the reduction plan for the pathogen water quality study that will eliminate the

unpermitted discharges? It is requested that discussion of this issue be included on the agenda for the next Oversight Committee meeting.

Table 1 Summary of Non-Attainment of NYS Chronic Standard

Waterbody	1988, Volume-weighted days of non-attainment				Percentage improved compared to HEP Baseline		
	HEP Baseline	Baseline POTWs at Permit Flow	Revised Planned Improvements (RPI)	Revised Sub-regional Plans (RSRP)	Revised Planned Improvements (RPI)	Revised Sub-regional Plans (RSRP)	Improvement difference btw RPI and RSRP
Hackensack River	164.74	182.43	133.9	22.66	19%	86%	**68%**
Passaic River	27.79	33.62	7.17	0.92	74%	97%	**22%**
Newark Bay	108.79	134.47	43.93	2.05	60%	98%	**38%**
Kill Van Kull	0	0	0	0			**0%**
Arthur Kill	50.4	81.06	30.7	6.19	39%	88%	**49%**
Raritan River	29.65	47.97	5.74	0	81%	100%	**19%**
Raritan Bay	0.6	1.14	0.34	0.07	43%	88%	**45%**
Hudson River, Tappan Zee to Battery	27.25	42.08	0.32	0	99%	100%	**1%**
Upper Bay, Battery to Verrazano Narrows	8.58	16.38	0.91	0	89%	100%	**11%**
Waterbody	1989, Volume-weighted days of non-attainment				Percentage improved compared to HEP Baseline		
	HEP Baseline	Baseline POTWs at Permit Flow	Revised Planned Improvements (RPI)	Revised Sub-regional Plans (RSRP)	Revised Planned Improvements (RPI)	Revised Sub-regional Plans (RSRP)	Improvement difference btw RPI and RSRP
Hackensack River	154.08	166.02	108.11	2.89	30%	98%	**68%**
Passaic River	19.87	23.26	2.01	0	90%	100%	**10%**
Newark Bay	114.69	126.81	54.26	0	53%	100%	**47%**
Kill Van Kull	28.29	36.36	0	0	100%	100%	**0%**
Arthur Kill	72.77	91.43	37	3.43	49%	95%	**46%**
Raritan River	49.76	65.71	12.17	0	76%	100%	**24%**
Raritan Bay	5.67	7.31	3.07	1.1	46%	81%	**35%**

Hudson River, Tappan Zee to Battery	30.1	37.07	12.39	0	59%	100%	**41%**
Upper Bay, Battery to Verrazano Narrows	17.02	23.89	1.99	0.48	88%	97%	**9%**

Table 2. Revised Sub-Regional Improvements* Simulated with SWEM (HydroQual, 2010)

Sub-Region	Improvements
Hackensack River	BCUA and SMUA C & N LOT CSO C & N LOT SW C & N LOT
Passaic River and Newark Bay	CSO C & N LOT SW C & N LOT
Raritan River/Bay	MCUA N LOT CSO C & N LOT SW C & N LOT
Kill van Kull	None
Arthur Kill	LRSA, JMEU, RSA N LOT CSO C & N LOT SW C & N LOT
Hudson River/Upper Bay	PVSC, BCUA-Edgewater (formerly EMUA), NBMUA, Hoboken (NHSA- Adams Street), West New York (NHSA River Road), Yonkers, North River, Owls Head “C & N Low N”

Table 3 Cost Associated with Improvements for Different Dischargers

Dischargers	Specified Improvement[a]	Effluent Conc. (mg/L) used in Simulation[b]		Cost[c]			Effluent Quality Based on Technology	
		N	C	Reference	Scenario	Present Cost Total ($MM, Year 2007)[e]	CBOD, mg/L	TN, mg/L
MCUA	LOT N	4	4	Table 8-5	Nitrogen - Targeting Original Upgrade Scenario (high)	892	3-5	3-5
PVSC	C & N Low N	20	8	Table 8-4	Nitrogen - Targeting Original Upgrade Scenario (low)	1,973	9-14	19-20
					Nitrogen - Targeting Original Upgrade Scenario (medium)	2,531	5-10	10-12
NHSA Adams Street	C & N Low N	20.6	8	Table 8-10	Nitrogen - Targeting Original Upgrade Scenario (low)	-	10-15	25
					Nitrogen - Targeting Original Upgrade Scenario (Medium)	180	5-10	10-12
NHSA River Road	C & N Low N	14	8	Table 8-12	Nitrogen - Targeting Original Upgrade Scenario (low)	35	10-15	25
					Nitrogen - Targeting Original Upgrade Scenario (Medium)	79	5-10	10-12
BCUA-Edgewater (formerly EMUA)	C & N Low N	15.8	8	Table 8-13	Nitrogen - Targeting Original Upgrade Scenario (low)	14	9-14	19-20
					Nitrogen - Targeting Original Upgrade Scenario (Medium)	37	5-10	10-12

					Nitrogen - Targeting Original Upgrade Scenario (low)	11	10-15	25
NBMUA, Woodcliff	C & N Low N	16.8	8	Table 8-15	Nitrogen - Targeting Original Upgrade Scenario (Medium)	30	5-10	10-12
					Nitrogen - Targeting Original Upgrade Scenario (low)	49		
Subtotal of above four					Nitrogen - Targeting Original Upgrade Scenario (Medium)	326		

a: based on Table 1 of PROGRESS AS OF JUNE 25, 2010 ON COMPLETING A DISSOLVED OXYGEN MANAGEMENT PLAN/TMDL FOR THE NY/NJ HARBOR June 2010 HRFO.001.019, by HydroQual July, 2010

b. based on Table 2 of PROGRESS AS OF JUNE 25, 2010 ON COMPLETING A DISSOLVED OXYGEN MANAGEMENT PLAN/TMDL FOR THE NY/NJ HARBOR June 2010 HRFO.001.019, by HydroQual July, 2010

c. based on Nutrient reduction Cost Estimates Study Summary report in Support of the New York - New Jersey Harbor Estuary Program by Metcalf & Eddy/AECOM, February 2008

d. based on Tables 3-1, 3-2 and 3-3 of Nutrient reduction Cost Estimates Study Summary report in Support of the New York - New Jersey Harbor Estuary Program by Metcalf & Eddy/AECOM, February 2008

e. cost in Million dollar corresponding to the Maximum Monthly flow.

Table 4

STP	Average Effluent Concentration for Total Ammonia (as N) mg/L - DMR data 2008 - 09 [a]	Calculated Average Total Nitrogen (TN) based on N effluent quality [b]	Average Effluent Concentration for BOD5 (or CBOD5 where noted with *), mg/L - DMR data 2008 - 09	LOW TN Model Run		Baseline Model Run	
				TN	C	TN	C
PVSC - PASSAIC VALLEY SEWERAGE COMM.	29.7	**37.13**	**9.1***	**20**	**8**	28.7	40.7
NBMUA - WOODCLIFF STP (limited N data)	8.9	**68.46**	**23.2**	**16.8**	**8**	16.8	34.2
NHSA, ADAMS STREET WTP (Hoboken)	4.01	**40.10**	**12.6**	**20.6**	**8**	20.6	18.6
NHSA, River Rd Plant (West NY)	13.5	**64.29**	**32.6***	**14**	**8**	14	33.6
BCUA-Edgewater (formerly **EMUA - Edgewater Municipal Utilities Authorities)**	12.9	**15.93**	**12.5***	**15.8**	**8**	15.8	22.9

[a] note, DMR data include maximum reported values that are not used in calculating these the final values
[b]Total Nitrogen is calculated based on % ammonia in TN as used in the SWEM model

Attachment 3

NYSDEC comments on the EPA NY/NJ Harbor Nutrient Reduction Plan and the draft trading document.

New York is mainly concerned with the EPA proposed NY/NJ Harbor Nutrient Reduction Plan (the EPA Plan) for the Hudson River/ Upper Bay and Arthur Kill Sub regions. These areas of the plan need additional investigation and discussion.

Hudson River / Upper Bay

The EPA Plan proposes low level nitrogen reductions to address predicted contraventions of the NYS Marine DO Standard in Hudson River / Upper Bay in the vicinity of Manhattan. This area is subject to significant tidal movement and flow from the Hudson River. It is not an area where one would expect to find algal blooms. It is presumed that the need for nitrogen reductions is to control phytoplankton growth. It is possible that phytoplankton blooms are not the problem. The carbon reductions, that accompany the nitrogen reductions, could be reason for the projected water quality improvements.

If it is truly a nitrogen problem there must be other alternatives to attain the nitrogen reductions that must be considered. The loads being transported down the Hudson have to be affected by atmospheric deposition reductions and MS4 reductions in the Hudson watershed (Rockland, Westchester, and counties north). These possible reductions should be analyzed. If they are not having an affect than maybe it is not a nitrogen problem. With a cost of approximately 700 million dollars in NY, the low level nitrogen reductions have to be better justified and alternative causes need to be investigated. Alternative remediation scenarios need to be investigated such as additional storm water and CSO capture and treatment.

The carbon loads impacting this area have to be better analyzed. The Long Island Sound TMDL load reductions need to better reflect the actual expected loads after implementation of NYC improvements.

A blanket no net increase may be premature for the New York discharges. A cap may be appropriate but at levels above the current discharge levels. This issue also needs more study.

NY also believes that a cost for each region of the EPA Plan has to be developed so that the impact of the plan can be evaluated.

Draft Trading Document

It is presumed that the draft trading document was meant to only apply to the Hudson River/Upper Bay. The EPA Plan requires the Limit of Technology (LOT) removals for all sources in the rest of the regions which does not allow for trading.

The draft trading document uses the Long Island Sound TMDL as a model but that model may not be appropriate for the Harbor. The systems and issues are different.

NYS does not agree with EPA's assumption that seasonal limits cannot be applied to the nitrogen loads. There is nothing in our understanding of the system that indicates that nitrogen discharged during the winter months is still within the system months later when the dissolved oxygen problems are predicted. Given the spring flows through the system it is highly unlikely.

Seasonal limits for both carbon and nitrogen loads appear to be appropriate and need to be evaluated, if reductions are necessary or future waste load allocations need to be established.

The third bullet under the first cut guide in formulating alternatives is confusing. If it applies to intra-zone trading, it is inconsistent with the first two bullets. If you are assuming pound for pound trading within a zone, par values are not needed. If the third bullet refers to inter-zone trading it is inconsistent with the fourth bullet.

It should be noted that that NYSDEC feels that the trading concept must be more fully discussed and developed in order to determine if it can be a useful tool to attain water quality goals in NY/NJ Harbor.

Arthur Kill

A cost estimate for the implementation of each component of the proposed EPA Plan for the Arthur Kill should be developed including the costs of the upstream improvements required in the NJ Tributaries. This should include cost estimates for each source category (STP, CSO, Stormwater). Coupled with the loading tables this will provide insight regarding pound reduced per $ expended and the relative expected improvement in water quality.

It should also be noted that improvements in the Arthur Kill are also dependent on full implementation of LOT level of controls in upstream NJ waters. This suggests that those sub-regional plans need to be part of any discussion regarding the attainment of the fish propagation goal for the Arthur Kill.

Attachment 4

August 17, 2010

Here are my comments on the nutrient trading paper that Kevin prepared:

1. The term management zone is used in the document, but is never defined. Long Island Sound had used the term "management zones" for geopolitical landside areas where loads originate. Long Island Sound also had a companion term, "response regions" to refer to different portions of the Sound's receiving water. To date for the Harbor, we have used one term, "sub-regions" to refer to both where the loads originate from and where the receiving water is. "Sub-regions" might work in Kevin's document; otherwise should define "management zones".

2. The document states that a permittee can prepare an alternative set of actions to produce a dissolved oxygen response equal to or better than the plan. This is somewhat ambiguous. Is the requirement equal to or better than the plan at all times and locations? Long Island Sound had restricted its trading requirements to July/August average DO results for three individual grid cells which were the most critical in each of response regions 2,5,and 6. Results for the response region 5 and 6 critical results were averaged and then that average was averaged with the response region 2 critical cell results. The calculations were done for each of two years as described and the two year results were then averaged for a final answer. Response region 5 and 6 results were first averaged before averaging with response region 2 results because they were proximal to each other . It was very difficult to dig up this information years after the LIS TMDL was established when NYCDEP was looking at trading. Fortunately, Paul Stacey from CTDEP had good records. Since the Harbor TMDL implementation will drag out for many years, we really should make a deliberate effort to state early and often and as unambiguously as possible the exact manner in which equal to or better than the plan needs to be defined. My personal suggestion for the Harbor is to go with all locations but to say something about what exactly gets averaged, something like: For each grid cell, the average of the calculated days of non-attainment under 1988 and 1989 hydrodynamic conditions for the alternative must be less than or equal to the average of 1988 and 1989 days of non-attainment for the plan.

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Attachment 5

EPA's Overview of TMDL Status

(Draft Sept 21, 2010)

This Overview presents EPA's assessment of where we are and where we intend to go. EPA believes that this material is technically correct, but others may wish to express different views.

Pathogens

Recreational standard

- As you recall, at the April PC meeting, EPA encouraged the states to adopt the more protective 30-day geometric mean for enterococcus as the standard to protect the primary contact recreation use, rather than the seasonal geometric mean.

- NJDEP (Kerry Kirk Pflugh on behalf of Commissioner) later responded that they preferred the seasonal geometric mean.

- NYSDEC is continuing to evaluate the implications of changing its previously stated preference for the seasonal geometric mean..

Shellfish Harvest

- In addition to primary contact recreation standards, the TMDL needs to address shellfish goals for those waters designated for shellfishing.

- NJDEP requested analysis of source contributions to increase open areas for direct harvest around Sandy Hook Bay. HydroQual is currently doing those calculations.

- NJDEP can then decide if TMDLs should be developed to meet these standards.

Dissolved Oxygen/Nutrients

- There is tentative agreement by the states and EPA to use the NYS version of the Marine DO Criteria, where attainable, for the DO/nutrient TMDL/Management Plan. NJ has formally agreed to use the NYS version of Marine DO and will adopt it via the TMDL process outlined in its SWQS rule. Formal agreement to extend the NYS Marine DO Criteria to additional waters is needed in order to complete final calculations and plan documents.

- HydroQual presented a draft plan of actions to the Oversight Group that would achieve those criteria or standards associated with the highest attainable use. This plan included actions such as a cap at current loads, reductions at specific treatment plants, reductions at CSOs/SW, and other reductions based on planned actions.

- Both States have submitted comments on the plan.

- The Oversight Group will meet on Oct 6th to: 1) seek agreement on technical aspects of the plan, 2) review any alternate actions proposed by the states, and 3) to identify any policy differences for elevation within agencies.

Toxics

- The mercury model has been enhanced to address comments from the Modeling Evaluation Group (MEG). A small MEG has been convened to review the modifications and determine if it is an acceptable tool for developing TMDLs. If satisfied with the modifications, it is anticipated that the calculations for the mercury TMDL can be completed by late Winter/Spring 2011.

- Toxics TMDL documents are being prepared by HydroQual for benzo-a-pyrene, DDT and metabolites, PCBs, dioxin/furans and chlordane. These documents are expected to be completed by Fall/Winter 2010. The main action associated with these TMDLs will be implemented through pollutant minimization plans. TMDLs for toxics will result in water-quality based permit effluent limits that are not attainable. EPA has been working for some time to address these permitting issues in the context of the Delaware Estuary PCB Phase II TMDL. The permitting strategy will then be applied to the Harbor.

- There are three additional toxic pollutants which also exceed standards in the Harbor: hexachlorobenzene; dieldrin; and heptachlor epoxide. While we do not have a modeling tool available to develop TMDLs for these contaminants, we expect that management actions required as a result of the toxics TMDLs will also reduce these contaminants.

Attachment 6

Factoring Economic Considerations into the Development of TMDLs for Dissolved Oxygen in the New York/New Jersey Harbor
(September 2010)

A. Phase I TMDL Development:

1. Use of New York State's Marine D.O. Criteria:

As a result of ongoing discussions regarding the development of TMDLs for dissolved oxygen for the open waters of the New York/New Jersey Harbor, EPA and the States of New York and New Jersey agree that NYSDEC's marine dissolved oxygen criteria constitutes the most scientifically defensible dissolved oxygen criteria for marine waters for the protection of aquatic life. As such these dissolved oxygen criteria will be used as the basis for protecting aquatic life in the open waters of the Harbor, where attainable, as follows:

- For those portions of the Harbor which are designated for full aquatic life protection, but where the marine dissolved oxygen criteria have not been adopted (i.e., New York's Class I and New Jersey's Class SE-2 waters);

- For those shared waters where New Jersey's current D.O. criterion is more stringent than the NY marine D.O. criteria (i.e., Hudson River north of the Harlem River and Raritan Bay); and,

- For those segments of the Harbor that are not currently classified for full aquatic life protection (i.e., New York's Class SD and New Jersey's Class SE-3 waters), but where the analyses show that this use is attainable.

2. Use Alternative D.O. Criteria Where New York State's Marine D.O. Criteria are not Fully Attainable:

For those segments of the Harbor where the analyses show that full aquatic life protection use (based on compliance with the marine dissolved oxygen criteria) may not be not fully attainable, the highest attainable use and associated dissolved oxygen criteria will be identified. It is envisioned that the resultant highest attainable level of aquatic life protection would be established as criteria by each State, and used as the Phase I TMDL endpoint for the applicable Harbor management zone. Specifically, the aquatic life use (which may be characterized as partial aquatic life support and/or seasonal aquatic life support) and associated dissolved oxygen criteria would be written on a spatial and/or temporal basis as in the case of the Chesapeake Bay, where seasonal aquatic life uses and dissolved oxygen criteria applied in the deeper waters based on critical conditions associated with the summer season. Wherever possible, both spatial and temporal elements should be limited as much as possible based upon critical conditions (i.e., the smallest segment for the shortest period of time).

3. Justification for the Use of Alternative D.O. Criteria:

In those cases where the marine dissolved oxygen criteria can not be attained, a use attainability analysis (UAA) would need to be completed in order to demonstrate that attaining the full aquatic life designated use, and associated dissolved oxygen criteria, is not feasible based upon one or more of the six factors in 40 CFR 131.10(g).

Specifically, based upon the analyses conducted to date, it is envisioned that the basis for these UAAs would be 40 CFR § 131.10(g)(3) which provides that attainment is not feasible because, "Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place." In this case, the UAA determination on whether the standards can not be attained in a specific management zone will be made based upon technical feasibility, i.e., whether the application of limit of technology (LOT) based controls for carbon and/or nitrogen for WWTPs and stormwater, and 100% reduction in CSO loadings will result in full attainment. This analysis will also identify the highest attainable aquatic life use and associated dissolved oxygen criteria as outline in A.2.

B. Economic Demonstration Following the Issuance of the Phase 1 TMDL:

Another factor which may eventually prove to be applicable in certain management zones is 40 CFR § 131.10(g)(6), which provides that attainment is not feasible because, "controls more stringent that those required by sections 301 and 306 of the CWA would result in substantial and widespread economic and social impact." In order to make this demonstration cost analyses would need to be conducted using EPA's March 1995, "Interim Economic Guidance for Water Quality Standards."

EPA and the States did not attempt to do the economic analyses to utilize this factor as part of the Phase I TMDL effort. The establishment of the Phase I TMDL will result in the issuance of permits with the applicable requirements necessary to comply with the identified wasteload allocations to meet water quality standards. In parallel with their efforts to fulfill permit requirements, the permitte may also conduct the detailed cost analyses consistent with EPA's March 1995, "Interim Economic Guidance for Water Quality Standards." Permittees may choose to conduct these cost analysis either individually or as a group in order to demonstrate "substantial and widespread economic and social impact," as per the above-referenced EPA guidance. The results of such analyses could then be submitted to the State and serve as the basis for either a State-issued UAA and potential aquatic life use/D.O. criteria changes for the specified water, or the issuance of a single discharger or multiple discharger variance(s) for that water.

In summary, each analysis of economic impacts must demonstrate:

- That the polluting entity, whether privately or publicly owned, would face substantial financial impacts due to the costs of necessary pollution controls (substantial impacts or would interfere with development); and,

- That the affected community will bear significant adverse impacts if the entity is required to meet existing or proposed water quality standards (widespread impacts or important development).

The analyses may include:

- an estimate of the capital and operation maintenance costs of the necessary pollution control;

- a determination of how the entity will finance the necessary reductions;

- defining the affected geographic area; and,

- estimate the change in socioeconomic conditions that would occur as a result of compliance (e.g., changes in median household income, unemployment, and overall net debt as a percent of full market value of taxable property).

It must be noted that in addition to making the above-referenced feasibility demonstration based on "substantial and widespread economic and social impact," the permitee(s) must also identify the highest attainable use/dissolved oxygen levels that can be achieved in the receiving water through the implementation of the most aggressive program which would not result in such economic/social impact.

Attachment 7

NYS Marine DO vs EPA Marine DO

Email to Leslie McGeorge on 9/20/2010

Leslie,

Kevin Bricke had a discussion a couple of weeks ago with Robin Miller regarding the federal vs NYS version of the marine dissolved oxygen criteria. I believe you had expressed an interest in it and Kevin thought it would be useful to do an analysis. This may be a moot point now that we understand that NJ has formally agreed to use NYS version of Marine DO and will adopt via TMDL process outlined in your SWQS rule.

I'm not sure that this needs to be discussed any more, but below is information from Robin.

Bob

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New York, NY 10007

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212-637-3889 Fax

Here is some specific information:

The NJ non-shared waters not expected to fully meet the NY version of the marine DO criteria even with the draft TMDL plan include:

Hackensack SE1 reach up to 16 days of the year
Hackensack SE2 reach, miles 11.4 to 3.8 portion, up to 78 days of the year
Passaic River/Newark Bay SE3 waters, 3 grid cells only, up to 29 days of the year
Raritan River SE1 reach, 3 grid cells only, less than 0.2 days

Here is what applying the federal criteria to these waters would do:

Hackensack River SE1 reach - No benefit slightly worse, the federal calculation for larval recruitment produces 18 days of violation per year instead of 16.
Hackensack River SE2 reach, mp 11.4 to 3.8 portion - Little benefit, the federal calculation for larval recruitment produces 75 days of violation per year instead of 78.
Passaic River/Newark Bay SE3 waters, 3 grid cells - Slight benefit, the federal calculation for larval recruitment produces 23 days of violation per year instead of 29.
Raritan River SE1 reach 3 grid cells - Arguably, the NY standard is fully met (ignore 0.2 days in 3 grid cells). The federal would also be fully met even more strictly, 100% compliance.

In addition to NJ non-shared waters, Kevin also requested a check of the Hudson River and Upper Bay where the draft TMDL plan is "low N or something less". The question was would the federal version instead of NY version eliminate the need for "low N or something less" entirely.

Going to low N brings the Hudson and Upper Bay into calculated compliance with the NY version in every grid cell except for one in the Upper Bay where the NY version is violated for up to 35 days in a year per the calculations. The federal version would still have up to 26 days in a year of calculated violation remaining.

Another way of looking at the "which standards version" issue in the Hudson/Upper Bay is to consider simply Planned Improvements, with no TMDL actions. Under that loading condition (i.e., no TMDL), there are calculated violations of the NY version of the standards in less than approximately 40 grid cells in the Hudson/Upper Bay of up to 56 days per year. The calculated violations of the federal standards are somewhat less, but still suggestive of a need for TMDL actions, in less than approximately 30 grid cells in the Hudson/Upper Bay for up to 45 days per year. Either way, NY or Fed standard, looks like TMDL reductions are needed. Differences here are occurring at the higher end DOs, above 4.64 mg/L, rather than at the low end, below 3.0 mg/L. The federal criteria larval recruitment curve accumulates violations between 2.91 and 4.64 mg/L. The NY chronic curve accumulates violations between 3.0 and 4.8 mg/L. There is also the difference at the juvenile and adult survival endpoint (federal 24 hr avg greater than 2.3 mg/L and NY acute never less than 3 mg/L) which really isn't a factor for the Hudson. Page 1 of the attached pdf illustrates the two curves used for nonattainment calculations.

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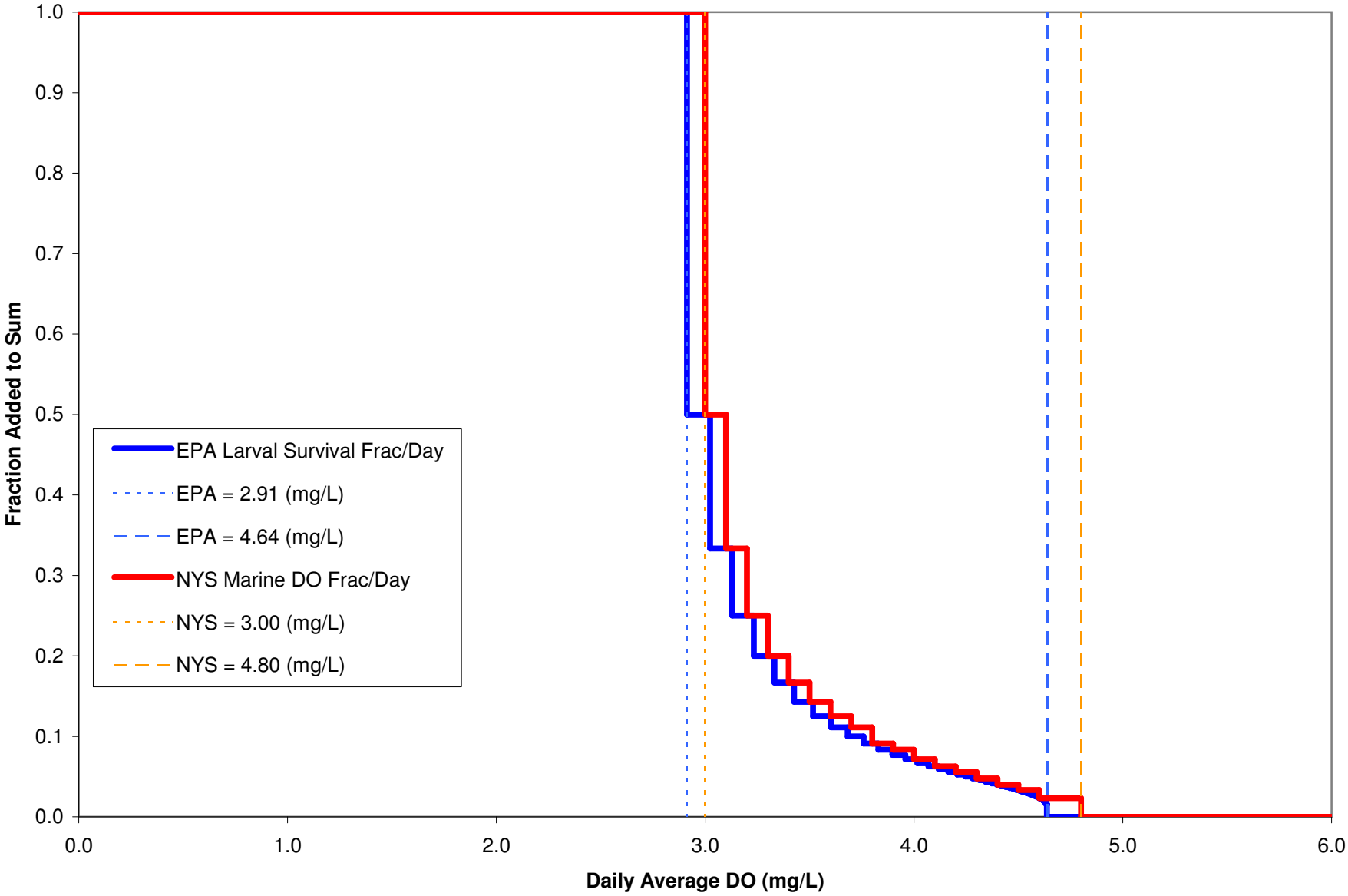
1.0
0.9
0.8
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Fraction Added to Sum
EPA Larval Survival Frac/Day
EPA = 2.91 (mg/L)
EPA = 4.64 (mg/L)
NYS Marine DO Frac/Day
NYS = 3.00 (mg/L)
NYS = 4.80 (mg/L)
0.0
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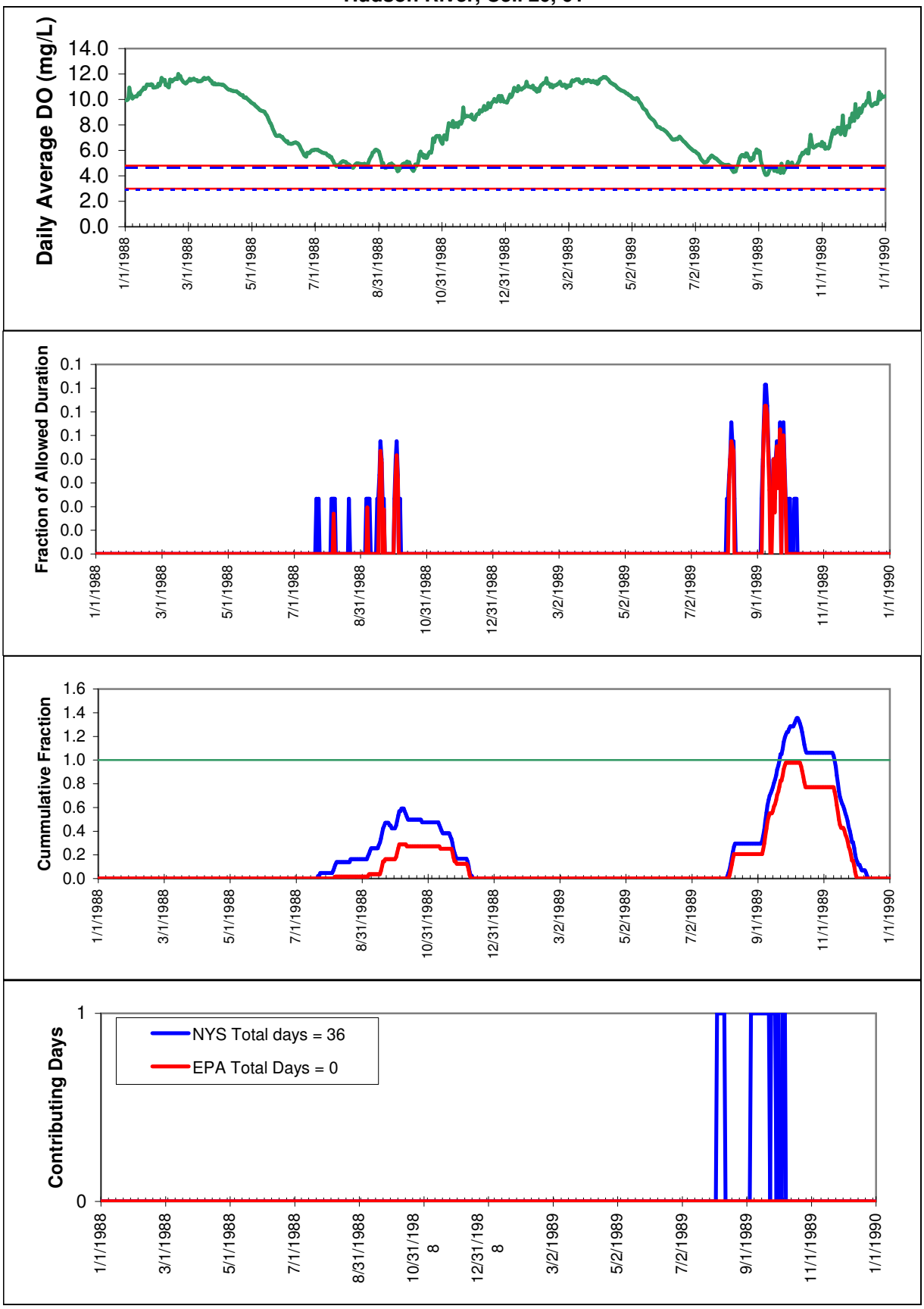
5.0
6.0
Daily Average DO (mg/L)

PLNDIMP3
Hudson River, Cell 20, 61



Direct Harvest Sandy Hook Bay
Base on Current Data/Model Run
From June 2010 HydroQual Report

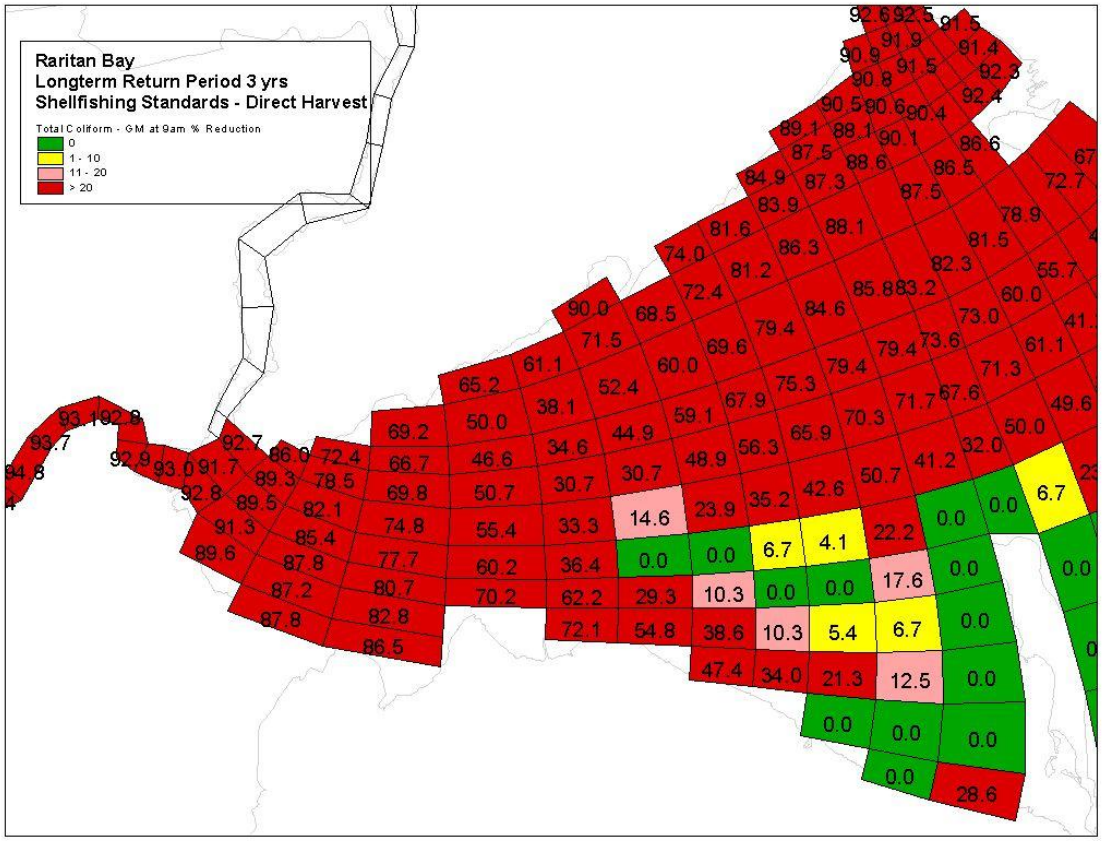
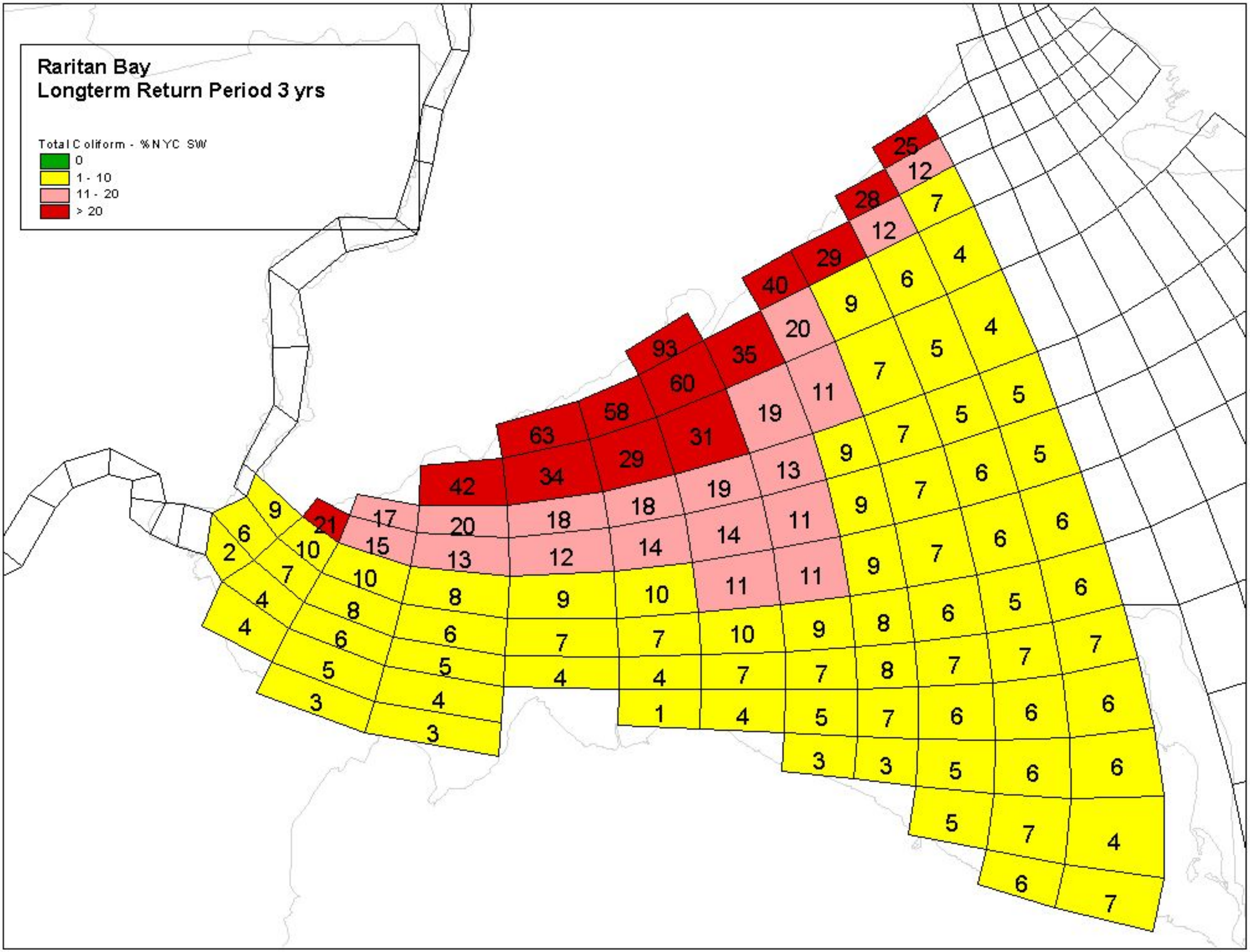


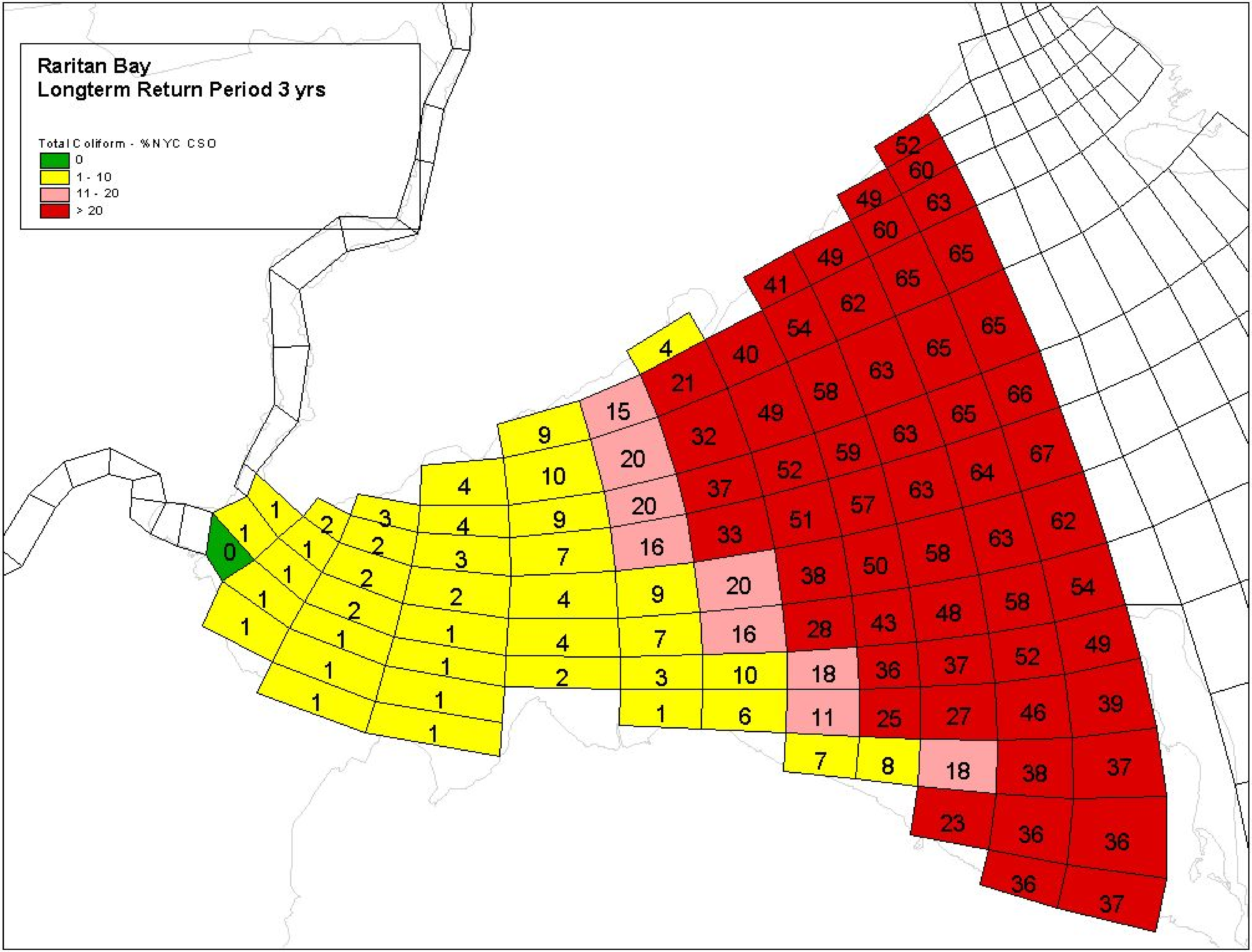
Figure 13. Total Coliform Reductions to Attain Geometric Mean
Direct Harvest
"Adverse" Conditions
9:00 AM
Three Year Return Interval

Raritan Bay
Longterm Return Period 3 yrs

Total Coliform - %NYC SW

- 0
- 1 - 10
- 11 - 20
- > 20

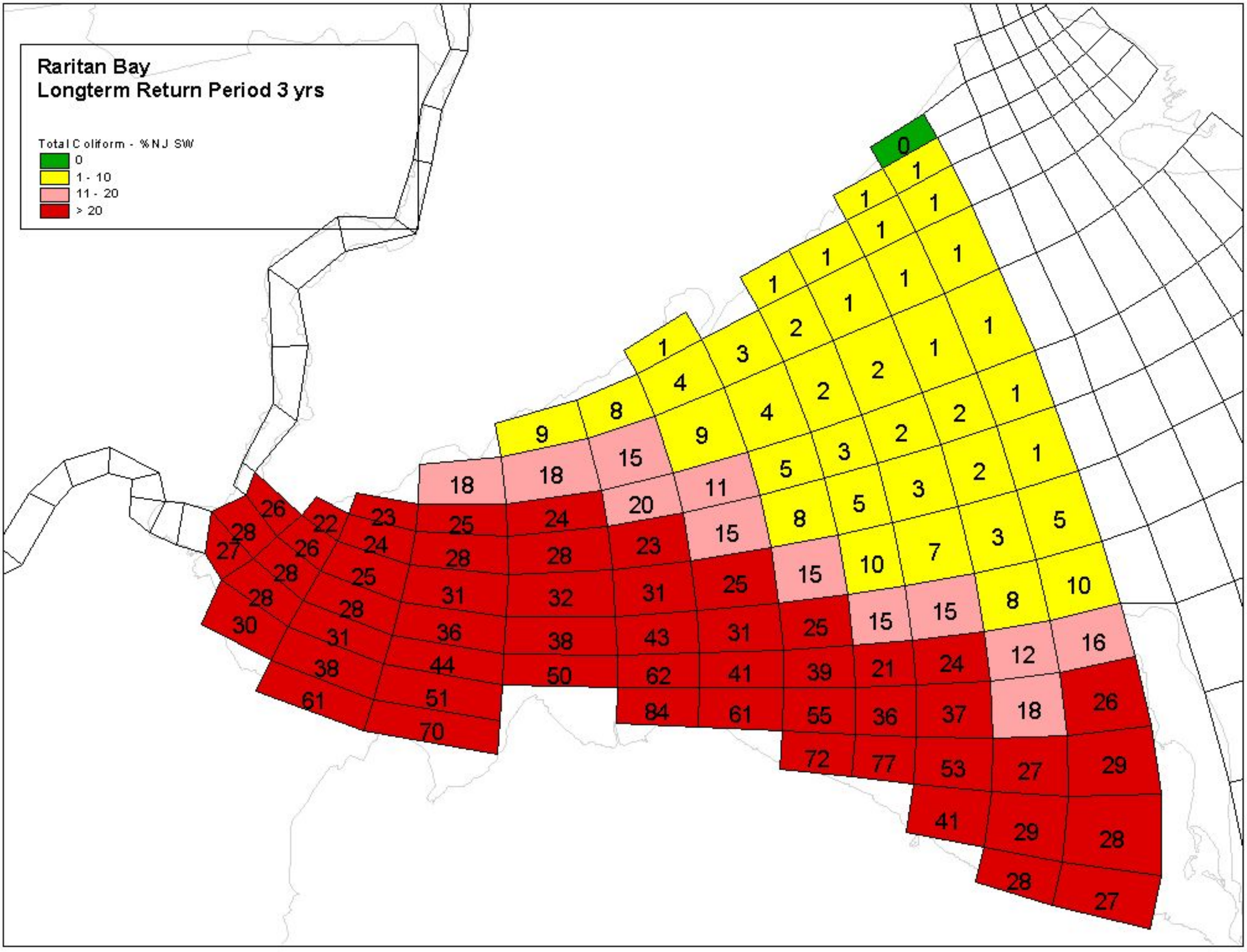


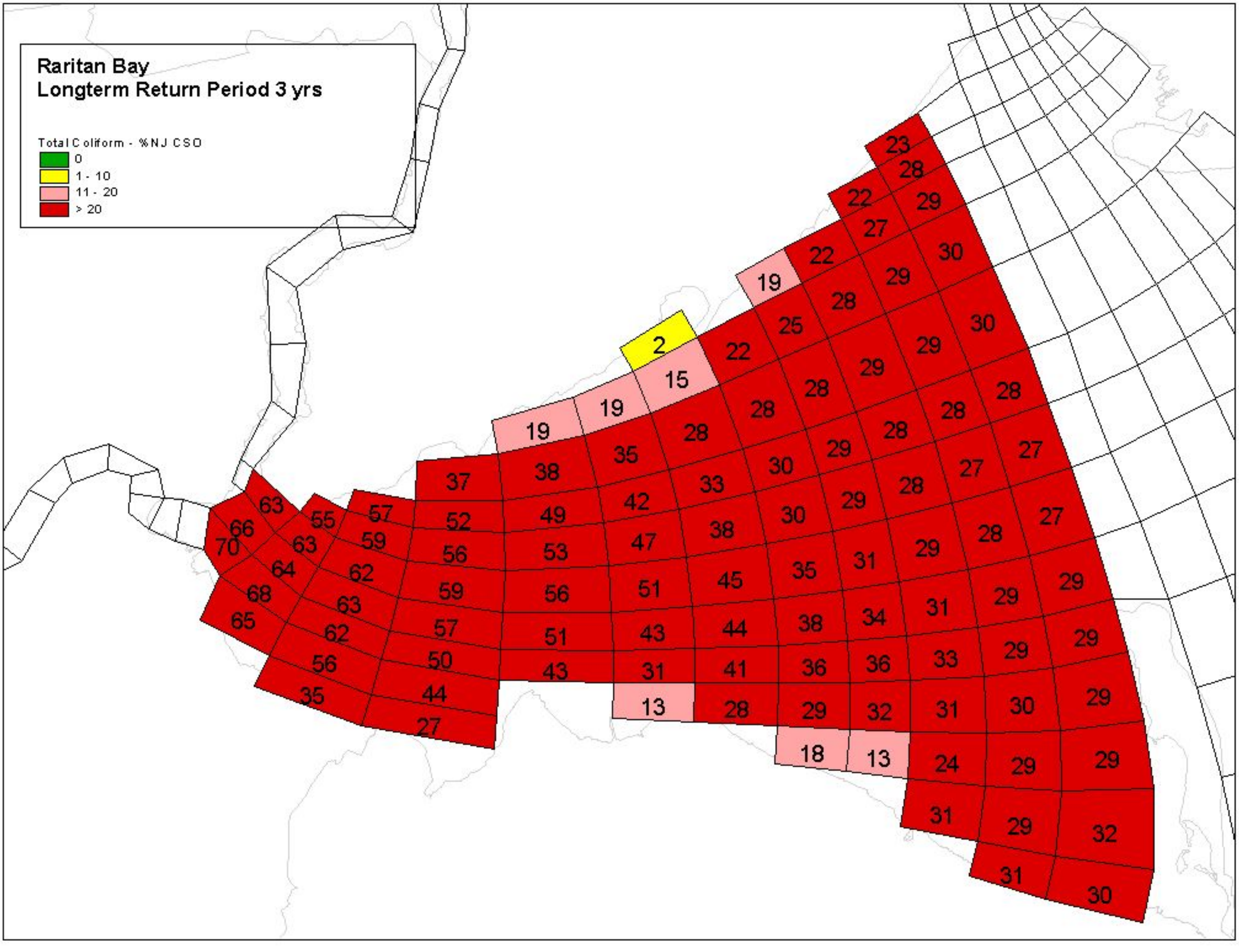

Raritan Bay
Longterm Return Period 3 yrs
Total Coliform - %NYC CSO
0
1 - 10
11 - 20
> 20

Raritan Bay
Longterm Return Period 3 yrs

Total Coliform - %NJ SW

- 0
- 1 - 10
- 11 - 20
- > 20




Raritan Bay
Longterm Return Period 3 yrs
Total Coliform - %NJ CSO
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22
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25
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