Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, Florida 33702

March 4, 1999

Colonel Terry R. Youngbluth
District Engineer, Wilmington District
Department of the Army, Corps of Engineers
P.O. Box 1890
Wilmington, North Carolina 28402-1890

Dear Colonel Youngbluth:

The National Marine Fisheries Service (NMFS) has reviewed the General Design Memorandum (SGDM) Supplement No. 2 and Draft Supplement No. III to the Final Environmental Impact Statement (SEIS) for the Manteo (Shallowbag) Bay, Dare County, North Carolina Project. The documents are referenced in the January 14, 1999, Public Notice and Notice of Availability (CESAW-TS-PE-99-28-0002) that accompanied your January 4, 1999, letter.

GENERAL COMMENTS

There are significant errors and inadequacies in the SGDM and SEIS. Of principal concern to us are (1) the possibility that building dual rubble mound jetties at Oregon Inlet could cause significant long-term harm to living marine resources and associated habitats; and (2) the inadequate description of the type and level of impacts that are possible. To assist the Wilmington District's efforts to comply with purposes and procedural requirements of the National Environmental Policy Act (NEPA), we have provided detailed specific comments. Our overall concerns are summarized as follows:

- It is not demonstrated that stewardship of aquatic habitats and associated living marine resources would be well served by building jetties that demand perpetual sand bypassing to preclude catastrophic erosion and damage. Findings presented in the SGDM/SEIS do not justify placing immensely valuable natural resources at risk and investing nearly $100 million for an annual benefit (after costs) of about $3 million.

- Despite reasonable and creditable scientific evidence of potentially catastrophic environmental harm, the SGDM/SEIS/EIS and other previous documents provide no meaningful discussion or evaluation of this possibility. Additionally, a viable and fail-safe contingency plan to address unanticipated chronic and severe short-term erosion events is not presented. The document also fails to acknowledge that the economic benefits and overall feasibility of the project could be substantially overshadowed by costs for needed mitigation or other required change(s) involving structural modification, additional sand bypassing, and creation of replacement habitats. Furthermore, failure to identify and describe significant and reasonably foreseeable impacts would

shift this responsibility to other governmental agencies that have responsibility for stewardship of lands and resources that may be affected by the project. For example, issuance of permits for use of Department of the Interior (DOI) lands is likely to be regarded as a "Major Federal action" and reasonably foreseeable impact that could have catastrophic effects would need to be described and addressed by the DOI.

- The document does not sufficiently describe the impacts of jetty-related reductions in the ingress of larval (subadult) fish and invertebrates through Oregon Inlet. Full disclosure of the range of possible reductions in larval ingress, the economic impact of reduced fish stocks, and the costs of corrective action must be presented for the Corps of Engineers (COE), NMFS, and others to properly evaluate the magnitude of impact that is possible.

- Plans to monitor environmental change, including detection of larval transport reductions, are largely conceptual and appear to be used in place of full disclosure of reasonably foreseeable impacts. The procedural aspects of identifying and possibly providing mitigation following jetty construction is not acceptable for purposes of the NEPA since it is possible that the impacts could far exceed the Wilmington District's ability to detect and remedy those impacts.

- Potentially significant discrepancies were found in the benefits analysis for the Jetty Alternatives. Most, if not all of the $2.7 million of increased private boating could be generated at other locations and in pursuit of other recreational activities that do not rely on inlet stabilization, but contribute to the Nation's economic development.

- Inclusion of fixed commercial vessel operating costs as a project-related benefit is also inappropriate since these costs would be incurred with or without the project. Adjustment of benefits in response to these and other apparent discrepancies could eliminate or substantially reduce the projected $3 million net benefit. Further, because owners of commercial vessels are consolidating operations due to overcapitalization, there will be fewer vessels fishing in the future. Hence, benefits for this sector appear overly optimistic.

- The alternatives analysis is unacceptably misleading in that it relies on the outdated and unfounded determination that a 20-foot-deep by 400-foot-wide navigation channel is needed at the ocean bar. These channel dimensions and associated annual bypassing of about 1.5 million cubic yards of sand are not required to support harvest of almost all of the fish that are available to, and are taken by, commercial fishers that operate in the vicinity of Oregon Inlet. The existing 14-foot Project (No Action Alternative), which involves annual dredging/bypassing of about 0.5 million cubic yards of sand and has an annual cost of about $5 million may actually yield a more favorable economic benefit.

- The SEIS acknowledges that jetties will prevent the continual influx of littoral sediment into the inlet. This influx of sand provides material that forms and maintains tidal flats, coastal wetlands, and submerged aquatic vegetation beds which are regarded as being some of the most productive habitats found. They are essential for sustaining production and harvest of species such as shrimp, blue crab, blue fish, red drum, flounder, spot, Atlantic croaker, seatrouts, and other

desirable fish and invertebrates. Although the possibility of "vertical change" in the flood tide delta is acknowledged, the short-term and long-term effects of disrupting natural processes that created and maintain the delta and associated habitats are not identified for environmental, ecological, and economic considerations.

Absent needed corrections concerning environmental and economic considerations, full disclosure of potential impacts of building jetties at Oregon Inlet, and revamping the alternatives analysis in accordance with present day conditions and needs of the fishing fleet, the document is deficient and misleading. As such, it cannot be used for determination of an environmentally sound and economically feasible course of action. In view of these considerations, the NMFS, as principal Federal steward of the Nation's living marine resources, has no recourse but to recommend against jetty construction and perpetual sand bypassing by mechanical means. Alternatively, we encourage that the Wilmington District provide safe and reliable navigation through Oregon Inlet by way of continued, and possibly greater, dredging effort and positioning of channel markers.

SPECIFIC COMMENTS

SUPPLEMENT NO. 2 GENERAL DESIGN MEMORANDUM

2. Recent Changes at Oregon Inlet

2.1.2 Major Shoreline Changes

Page 2-8, paragraph 1. According to the document "it is clear that maintaining the navigation span will become increasingly difficult and more costly in the future." While this may be the case, the effect should be short-lived since the existing bridge is scheduled for imminent replacement. The navigation span on the new bridge will be in the range of 2000 linear feet and, according to the North Carolina Department of Transportation (NCDOT), the design will accommodate existing conditions at Oregon Inlet. This should be revealed in the document since, as currently presented, it incorrectly appears that jetties are required to sustain the NC Highway 12 (Bonner) bridge.

3. Update of Jetty Plan

3.4.3 Shoreline Response to Weir Jetty/Sand Bypassing

Page 3-30, paragraph 1. According to this section, the concrete barrier used to preclude sand movement through the jetties was eliminated since "sand tightness" is no longer required with addition of the weir. Considering that the volume of sand involved is substantial, and that it migrates in both directions (north to south/south to north), it would appear that uncontrolled sand flow through the jetties could interfere with navigation and possibly create the need for additional dredging. It would also appear that a portion of this material could be lost from the littoral zone since it might be carried offshore by ebbing tides and deposited in depths from which inshore migration does not occur. This would exacerbate shoreline erosion.

Our concern is substantiated by information found in the Phase II SGDM Appendices 1 through 5 which states, "Since the primary purpose of a jetty is to prevent littoral materials from entering the inlet, thus assuring a stable and navigable channel, it is essential that each structure be made impermeable to sand transport. The degree of sand impermeability necessary to accomplish this goal cannot be realized by the placement of stone and artificial units alone due to the voids present between the individual units, particularly true of the relatively large units proposed for Oregon Inlet."

Page 3-31, paragraph 2. It is stated that, "dredging can be accomplished during the less biologically active seasons in the fall and winter versus summertime dredging proposed with the prior design." Page 5-1, paragraph 2 of the SGDM, states that dredging would occur "during the low wave energy periods that occur between May and August each year..." While we understand that the statements refer to dredging at different locations and for different purposes, it should be clear throughout the document that dredging and bypassing will still be required during periods of high biological activity.

5. Sand Management Plan

5.1 Summary of FDM Recommendations

Page 5-4, paragraph 4. According to this paragraph, "the plan includes emergency or contingency measures which would allow beach nourishment during periods of high wave activity should conditions on either Bodie Island or Pea Island reach some critical condition or should the material accumulated on the fillets (bar area on each side of the jetty) be insufficient to satisfy the sediment demands of the erosion thresholds." It is also noted in this section that, "contingency sand sources would also be available to counter the impacts of increases in sea level if the sea level rise impacts threatened the integrity of the project." According to the document (same paragraph), "The emergency sand sources consist of residual ebb tide delta deposits that would be contained between the jetties, shoals located in the vicinity of the Bonner Bridge navigation span, and navigation maintenance material previously deposited off the north end of Pea Island." Considering that the material located "off the north end of Pea Island" is exposed to open ocean conditions, it seems improbable that this material could be used during winter periods when emergency conditions are most likely to occur. It also appears that use of material from the flood tide delta and shoals located in the vicinity of the Bonner Bridge navigation span is unreliable since, according to page 3-8, paragraph 4 of the SEIS, the influx of sand through the inlet will be eliminated with addition of the jetties, and it is this sand that sustains the flood tide delta.

Based on the preceding, it appears that designated emergency or contingency sand supplies could be unavailable during winter and hurricane seasons and that the possibility of highly destructive beach erosion and island overwash would be possible with the jetties. It also appears that in a dire emergency, excavation of sand from protected, but highly productive shallow estuarine waters could be sought. These matters need clarification and full disclosure.

6.2 Annual Costs

6.2.1. O&M Cost Update

Page 6-12, Table 6.8. The values provided in this table rely on "best case" conditions that may not exist. For example, the estimated cost of dredging and bypassing of 560,000 cubic yards of sand for the existing project is estimated to be $5,039,000 (or $9.00 per cubic yard). The estimated cost of dredging and bypassing 862,000 cubic yards of sand for the Jetty Alternatives is $3,903,000 ($4.53 per cubic yard). The difference is explained by determining that, while greater in volume, sand relocation with jetties is more economical because a standard pipeline dredge (as opposed to an ocean certified dredge) could be used. Yet, according to page 3-3, paragraph 4 of the SEIS, use of a standard pipeline dredge "may become an option to perform sand bypassing." In other words, use of a standard pipeline dredge is uncertain. If a standard pipeline dredge cannot be used, then dredging costs would approximate the "without project" costs of $9.00 per cubic yard. Removal of 862,000 cubic yards of material at $9.00 per cubic yard would increase this cost to $7,758,000 and eliminate the projected net benefit of $3 million. Also, according to page 3-3 of the SEIS, use of booster pumps also may be required. The additional cost of booster pumps needs to be addressed and accounted for in the project's cost and benefit analyses and in Table 6.8.

Pages 6-11 and 6-12. The estimated annual cost of bypassing sand needed for "Nourishment for Thresholds" is $288,000. According to pages 6-11 and 6-12, this is identified as the "equivalent cost of dredging 500,000 cubic yards assumed to be needed at project years 10, 20, 30, and 40." The total volume of this is 2,000,000 cubic yards and the average annual amount of sand moved over the 50-year project life is estimated to be 40,000 cubic yards. Based on these values, the estimated annual cost for moving 40,000 cubic yards of sand from exposed ocean locations on either side (outside of) the jetties is $7.20 per cubic yard which is $1.80 per cubic yard less than costs identified in Table 6.8 that also involves dredging with ocean certified equipment. The cost difference ($9.00 vs $7.20, or $1.80) needs to be explained.

This section also states that additional sand bypassing would be required to contain project-induced erosion within established thresholds. To determine this cost, it is estimated that sand bypassing would need to occur at ten-year intervals with the final interval occurring at project year 40. This seems to imply that the annual cost was determined based on 40 years worth of sand bypassing rather than 50 years worth of bypassing. In other words, at the end of the 50-year project life a project induced sand deficit of 500,000 cubic yards would exist. Since the need to bypass sand would be imminent and directly linked to inlet stabilization, it seems that the cost of this dredging should be identified as a project cost and identified in applicable tables and cost assessments.

7. Oregon Inlet Dredging Alternative -- Ocean Certified Pipeline Dredge

A significant portion of the project's costs and benefits are related to excavation and maintenance of a 20-foot-deep by 400-foot-wide navigation channel across the ocean bar. The need for a channel of this magnitude is based on earlier project designs that projected intensive fishing efforts utilizing a predominance of deeper draft vessels needing almost continuous navigation access across the ocean

bar. The projected fish landings used for the 20-foot-deep/400-foot-wide channel have been determined to be grossly inaccurate -- they do not exist. Consequently, the earlier landing estimates were abandoned and replaced with substantially lower numbers. As a result of this, it has been demonstrated that all available fish can be taken by vessels that presently traverse the ocean bar under existing conditions whereby authorized channel dimensions of 20-feet (depth) and 400-feet (width) are available "... less than 24 percent of the time" (page 7-23, paragraph 2). Also, because most offshore fisheries are overcapitalized, fleet size will be reduced as owners increase the efficiency of fishing operations by using fewer vessels. This will be particularly true for the 10 to 30 years that it will take to rebuild overfished fisheries such as sea scallops, swordfish, sharks, and summer flounder.

Considering that all available fish are taken without the 20-foot-deep/400-foot-wide ocean bar channel, it is inappropriate to stipulate that such dimensions, and the associated annual maintenance of 1,563,000 cubic yards of material, are needed in connection with either of the Dredging Alternatives presented in the SGDM. In terms of actual dredging costs, the real price of annual maintenance dredging of the ocean bar is about $5,000,000 (page 7-23) -- not the estimated $8,148,000 (spring dredging) to $10,601,000 (fall dredging) that, according to the Wilmington District's own estimates, would not provide the functionally defunct 20-foot-deep/400-foot-wide channel.

Clearly, incorporation of the preceding perspective into the alternatives analyses is needed to correct the use of invalid conditions or requirements in connection with the Dredging Alternatives, and to correct the resulting gross distortion of costs, benefits, and impacts of the Dredging Alternatives. This also applies to the existing 14-foot Project and the No Action Alternative because evaluation of these alternatives was also performed using the 20-foot-deep/400-foot-wide channel as the standard for success.

Realizing that the analyses of the Dredging Alternatives are not valid because they rely on dredging requirements that do not exist, the NMFS performed a cursory examination of costs and benefits for the existing 14-foot Project (i.e., the No Action Alternative using actual costs and benefits) and the Jetty Alternatives. The results of this admittedly facile analysis show that economic benefits of the existing 14-foot Project or No Action Alternative, using actual conditions, could exceed those of the Jetty Alternatives. We submit that:

- Annual costs for the existing 14-foot Project is $6,949,000 (Table 7.7). Using projected annual "benefits" of $17,986,000 (value of fish landing through Oregon Inlet according to NC Division of Marine Fisheries) a B/C of 2.6 is realized.

- Annual costs for the Jetty Alternatives is $10,643,000 ($6,132,000 for dredging/sand bypassing + $4,520,000 for interest/amortization on the jetties). Annual benefits include $17,986,000 [value of fish landing through Oregon Inlet according to North Carolina Division of Marine Fisheries (NCDMF)] and $7,237,000 which reflects reduced fishing time and increases in recreational opportunities, or a total $25,223,000. The associated B/C is 2.4.

While this analysis is an over-simplification of what is needed to determine the proper course of action at Oregon Inlet, it illustrates that a major reevaluation of the Wilmington District's assessment may be warranted. This is especially true considering that the analysis we present: (1) utilizes actual dredging needs and costs rather than those for dimensions that clearly have no relevance to current navigation needs at Oregon Inlet; (2) relies on the actual benefit of the exiting 14-foot Project or the true No Action situation. [This is important because an aberration of the COE's analysis requires that benefits of inlet stabilization (reduced vessel operating costs and recreational benefits) must be assigned to the 14-foot Project and actual benefits (fish landings) are ignored]; and (3) indicates that the existing 14-foot Project could yield a higher economic benefit than the Jetty Alternatives.

Based on the preceding, we strongly encourage preparation of a cost/benefit analysis that utilizes actual conditions rather than an analysis based on hypothetical requirements and benefits. In this regard, use of an incremental analysis involving slight increases in channel dimensions and beginning with the 14-foot Project might be useful in determining an economically/environmentally balanced project. In addition, the new analysis should incorporate needed corrections for dredging costs and benefits that are identified in the preceding comments and those that follow.

8. Economic Analysis

8.4 Recreational Boating

See following comments

8.5 Commercial Recreational Boating

Pages 8-2 and 8-3. A significant increase in recreational usage from private boaters, charter boats, half-day charter boats, and head boats is predicted. Despite this, there is no evidence that limiting factors such as the capacity of existing marinas, docks, and boat landings have been considered. This is especially important in the case of the projected increase in charter boats, half-day charters, and head boats because, if the existing facilities are not sufficient to accommodate the increase, then additional costs will be incurred to achieve the benefits. For example, new marinas may need to be built, dredging may be needed to provide access from the new marinas to navigable waters, access roads to the marinas may be required, etc. These costs need to be subtracted from the potential benefits of the projected growth.

Consideration also should be given to the potential negative impacts of the projected growth in private boaters, charter boats, half-day charter boats, and head boats. At some point, the area may become congested and over-fished. This would lead to environmental degradation and devaluation of the value of the recreational experience. The environmental consequences of this change should be identified in the SEIS and the decrease in value of the recreational experience should be subtracted from the recreational benefits.

8.6 Private Recreational Boating. See also preceding comments.

Pages 8-3 and 8-4. The questionnaire used to determine these values, inquires as to the number of additional trips that would be made to Oregon Inlet if stabilization were to occur. While the survey results may provide some measure of additional use, it provides no measure of possible benefit. To verify the projected benefit it would be necessary to demonstrate that, in the absence of boating at Oregon Inlet, participants in the survey would not participate in any other activity that might generate a National Economic Development (NED) type benefit (i.e., boating at other locations or other recreational activities at other locations would not be pursued). Considering the vast opportunity that exists for recreational boating and other activities in the survey area, it is unreasonable to assume that no other related activity would take place. Consequently, in the absence of conclusive evidence that no other NED type activity would be sought by private boaters, the $2,774,000 projected "benefit" is invalid.

8.7 Summary of Recreation Benefits

Page 8-4, Table 8.1. As mentioned in the preceding, the $2,774,000 benefit for private boats was derived using a questionnaire that does not distinguish between project generated benefits and those that represent relocation of benefits from other locations. Consequently, the $2,774,00 benefit cannot be substantiated and should be eliminated.

8.8 Commercial Fishing Analysis

Page 8-5, paragraph 1. The great disparity between fish landing estimates provided by the NMFS and the NCDMF raises serious questions concerning use of a "cost per pound" analysis to determine the value of fishing effort reductions for the Jetty Alternatives. More importantly, determination of a cost per pound value is not needed because the value of the savings (additional fishing time x cost per hour of fishing) is straightforward and inclusion of a cost per pound estimate confuses the issue and increases the potential for error and disagreement. Accordingly, the cost per pound analysis should be dropped.

The cost per hour estimate ($80.21) used to determine the value of increased fishing effort caused by conditions at Oregon Inlet includes both fixed and variable costs. The fixed cost, which includes such items such as interest on the vessel, depreciation, dry dock, and insurance is $18.38 per hour according to Table C-12 of the SGDM. Since this cost exists regardless of whether a vessel is in port or fishing, it cannot be counted as a project-related benefit of the 27,163 hours of fishing time that would be "saved" if the inlet is stabilized with jetties. This cost is incurred with or without the jetties. If the fixed costs are deducted from the overall estimate, a real cost of $61.83 per hour (with the project) is realized and the project (jetties) related benefit is reduced to $1,679,488 (27,163 X $61.83) using the Fishing Frequency analysis found on pages C-24 and C-25 of the SGDM. This value, not the $2,011,000 or $2,798,000 estimates provided in this section should be used.

In addition, the 27,163 hours reduction in fishing time that would be realized with the jetties is substantially less than the savings that was predicted in earlier documents. For example, in the Wilmington District's 1968 Review Report it is mentioned (page 24) that, "at least two-thirds of the 60 North Carolina vessels that are operated from Wanchese could be used to fish an additional 4

days each year." This translates into a total hour savings 3,840 [40 (number of vessels) x 160 (hours saved by each vessel)] which is 23,323 hours less than the current estimate. If two days of saved fishing time is included for each of the 100 part time fishing vessels that operate in the vicinity of Oregon Inlet, this would add another 4,800 hours of saved fishing time, but still leaves a difference of 18,523 hours when compared to current estimates. The enormous difference in these values should be explained, especially in view of the fact that the navigation capability and weather information available to modern fishing vessels has improved substantially, and the need to use other ports (e.g., Hampton Roads) can be determined without traveling to Oregon Inlet. Finally, fewer vessels will be required to harvest offshore fishery stocks, particularly during the rebuilding phase which could last 10 to 30 years, depending upon the life history of the species under management.

8.9 Vessel Losses and Damages

Pages 8-5 and 8-6. The NMFS supports all reasonable and prudent measures that might improve the safety of vessels operating in the vicinity of Oregon Inlet and other locations. However, the information presented infers that vessel losses and loss of life do not occur at jettied inlets. We know that this is not correct based on limited observations from other inlets. For example, at the jettied inlet entrance to Charleston Harbor (South Carolina) four lives were lost in December of 1997, when the sailing vessel MORNING DEW struck the north jetty in a winter storm. We know of at least one other vessel (shrimp boat) that has sunk in recent time near the Charleston jetties.

While it is possible that jetties could reduce damage and loss of life, the actual measure of safety provided is relative to that of the inherent danger of placing immoveable structures in coastal waters. To ensure that the risks with jetties are understood and to ensure accuracy of the possible benefits attributed to savings in vessel damages and human lives, a comparison of comparable jettied and unjettied inlets is needed.

8.14 Benefit Summary

Page 8-9, Table 8.2. Numerous discrepancies and errors, involving more than $3,000,000 in projected benefits are identified in the preceding comments. These comments should be addressed and needed changes should be made throughout the document, including Table 8.2.

8.20 Prevention of Drowning

Page 8-12, paragraph 2. As stated in comments pertaining to Section 8.9 of the document, it cannot be assumed that jetty construction will eliminate or even reduce the number of drownings at Oregon Inlet. As noted in the benefit analysis, the jetties are expected to attract large numbers of boaters and it is possible that the level of risk could be elevated simply as a result of increasing boater use in an area that is inherently dangerous. To ensure that the risks with jetties are understood and to ensure the accuracy of possible benefits attributed to savings in vessel damages and human lives, a comparison of comparable jettied and unjettied inlets is needed.

Pages B-30 and B-53. The figures presented on these pages infer that the proposed shore anchorage section of the jetty will traverse an area that may support tidal flats and emergent wetlands. Considering that the foot print of this section is in the range of 100 feet in width and additional areas may be needed for construction and access, the total area involved is large and effects on wetlands, if found here, could be substantial. Therefore, the location and types of all potentially affected wetlands should be identified, along with measures that are needed to avoid, minimize, and offset any wetlands losses.

Page C-5 Recreational Boating Analysis. Using the historic rate of growth for charter boats, the projected rate of growth is 4.7 percent for the first twenty years of the project. This growth rate is the rate of increase from 1984 to 1997. Close examination shows that the growth rate from 1984 to 1987 was 9.5 percent but as the market became saturated the growth rate decreased significantly. This is evident by the 1.6 percent growth rate that occurred from 1990 to 1997. Therefore, it may be more appropriate to use a lower growth rate, such as 1.6 percent.

Regardless of which growth rate is used for charter boats, half-day charters, and head boats, it needs to be substantiated that sufficient excess demand exists to accommodate the projected increases in use for each of these categories. If the excess demand cannot be substantiated, then the increased usage could represent a transfer of benefits from other locations such as Hatteras Inlet. If the increased usage is only a transfer, then the only NED benefit would be the time savings for the reduced travel time for the recreation user to get to the departure site.

If it is assumed that new charter boats, half-day charter boats, and head boats are to be added to the existing fleet at various intervals in the future, it should be assumed that most, if not all, of the fleet would be added regardless of the project. This is evident by the current increased growth rate in the fleet under the without project conditions. Therefore, the benefits for any additional fleet should be limited to the number of additional trips attributed to the project (10.45 per year) and the benefits claimed in Table C-4 would be significantly lower. As previously mentioned, because the projected growth is significant, excess demand in the area should be demonstrated to ensure that the projected benefits do not include transfer of benefits from other areas. Also, it is unlikely that charter and headboats will increase substantially in number while overfished stocks are rebuilding. By the time rebuilding is complete, energy costs may inhibit fleet growth.

Page C-11 Private Recreational Boating

See previous comments concerning Pages 8-3 and 8-4.

According to the SGDM, stabilization of Oregon Inlet would increase annual recreational boater usage from 8,968 trips to 20,191 trips and would generate additional revenues of $2,774,000. The questionnaire used to determine these values, inquires as to the number of additional trips that would be made to Oregon Inlet if stabilization were to occur. This is problematic because it assumes that without stabilization, pursuit of recreational activities in other locales will not take place and no NED type benefit will be realized. In all probability, boater recreation would still occur, but at some other location. Consequently, it is possible that most, if not all of the projected “benefits” are from

the reallocation of use from other locations and would exist with or without the project. As such, they cannot be counted as a benefit of inlet stabilization. To retain the projected benefit, it must be shown that in the absence of the project, the vessels involved would not be used at any location. Additionally, the analysis assumes that in the absence of the project, no other type of recreational activity (bank and pier fishing, bird watching, hiking, etc.) that might result in an NED type benefit would occur. This is unlikely since, in lieu of recreational boating at Oregon Inlet, it is reasonable to assume that other recreational activities would be pursued.

Unless it can be demonstrated that no other use of the mentioned recreational vessels would occur without the project and other recreational activities that contribute to the NED would not take place the projected benefit is unsubstantiated and should be eliminated.

Page C-22, last paragraph. According to this section "delay time spent by the crew on a vessel is work time, and they could be expected to seek additional work if that time were saved." It further states that delays are in large blocks of 12-24 hours, thus they could seek work elsewhere. Considering that the delays are highly irregular (3 times per year exiting and 8 times returning) it would appear that employment opportunities would be substantially limited. Therefore, the time saved could, according to COE guidance (ER 1105-2-100), be valued as leisure time and computed at 1/3 the wage rate. If the $45.31 used as the opportunity cost of labor, and the $2.22 used for the opportunity cost of management (Table C-13), are replaced with $15.10 ($45.31/3) and $0.74 ($2.22/3) respectively, the benefits claimed for improvements to fishing efficiency would be substantially reduced. If the fixed costs are eliminated as a project-related benefit (see preceding comments concerning page 8-5. paragraph 1) the opportunity costs for management and labor are adjusted in accordance with the preceding, the projected hourly savings ($80.21) is reduced to about $36.60. Using this estimate to compute the total value of the savings from reduced fishing time, a value of $994,166 is realized.

Considering that this is substantially less ($1,016,340) than the estimated savings of $2,011,000 that is provided in the economic analysis, reexamination of the projected benefit is needed. In fact, with elimination of $2,774,000 attributed to private boat use (actually a relocation of benefits) and use of the preceding values for savings from reduced fishing time, the total annual benefit of inlet stabilization is reduced to $3,446,166, which is substantially less than the total annual cost of $5,835,000.

Page C-24 Fishing Efficiency

See previous comments concerning page 8-5. paragraph 1 of the SGDM.

The savings for reduced fishing time is based on the estimated number of hours saved as a result of jetty construction and the estimated cost of fishing -- $80.21 per hour. In our previous comments we point out that the cost per hour value incorrectly includes fixed costs and other questionable savings. We also point out that conversion of this savings to a price per pound of fish landed is confusing and unnecessary because the value of the fishing time saved can be derived by simple multiplication (number of hours saved x the value of those hours). To illustrate this, we note that

the product of the District's estimate for total fishing hours saved (27,163) and the NMFS value of each hour ($61.83) yields $1,679,488 (27,163 X $61.83) in saved fishing time. Yet the savings, when computed on a per pound basis, inexplicably increases to $2,011,000. [Derived by multiplying $0.12 per pound value (determined by dividing the Wilmington District's total hourly savings estimate of $2,179,000 by the 1987 fish landing estimate of 17.9 million pounds) by the NMFS estimated landings for 1995 (16,758,000 pounds), or $0.12 x 16,758,000) = $2,011,000].

In addition to the preceding, the economic analysis is confusing in that the benefit from increased fishing efficiency is estimated at $2,011,000 (page C-25) yet the savings derived using "Alternative Using Vessel Surveys" is $1,417,000. This disparity, and the rationale for selecting the higher value benefit ($2,011,000) needs to be explained.

Page C-28 Sensitivity Analysis. According to this section, local fishermen receive about $0.05 less per pound than the national average, and an annual benefit of $1,065,000 is claimed in connection with elimination of lost revenues due to catch deterioration. However, it is not demonstrated that deterioration caused by an unstable inlet is the cause for the price difference. The price difference may just be a regional factor. Also, the report makes the claim that fishermen must leave the fishing grounds early in some cases for a favorable tide at Oregon Inlet. This would only improve the quality of the fish since the catch would arrive sooner. Unless it can be shown that the reduction is specifically due to conditions at Oregon Inlet, this benefit category should be eliminated.

Page C-30-31 Increased Charter Boat Income. Table C-16 establishes the fixed cost of boat operation at $168.14 per trip. This cost includes such items as insurance, depreciation, interest, and dockage. While it is unclear how the average annual benefit ($365,000) was derived, it is apparent that the fixed costs are included in this amount. Considering that the fixed costs exist whether the vessel is in port or fishing, they cannot be counted as a project benefit since they are incurred with or without the jetties. The projected benefits should be appropriately adjusted.

Page C-44, Table C-26. It should be noted that values provided in the Benefit/Cost Ratios and Net Benefit do not depict actual costs and benefits of the overall Jetty Alternatives. The estimated Annual Cost of the jetty project is $4,520,000 and was derived by combining annual costs of the jetties (which consist of interest and amortization on the financial first costs) and "savings" of annual operation and maintenance (O&M) that would occur if the jetties are built. In this analysis, the O&M cost for the project ($6,132,000 annually) is not identified since it represents a $341,000 "savings" over O&M costs ($6,473,000) of the existing 14-foot Project. While this analysis complies with COE guidance, it does not reveal that the actual overall annual project cost is $10,993,000.

While this may not be relevant in terms of the incremental costs and benefits of adding jetties to the existing situation, it becomes highly relevant when the total actual costs and benefits of building and maintaining a jettied inlet are compared to maintaining the 14-foot Project. As noted in our cursory evaluation of the existing 14-foot Project and the Jetty Alternatives (provided above in connection with "Oregon Inlet Dredging Alternative -- Ocean Certified Pipeline Dredge"), the benefit/cost ratios of each alternative are similar.

DRAFT SUPPLEMENT III TO THE ENVIRONMENTAL IMPACT STATEMENT

1.00 Summary

1.01 Major Conclusions and Findings

Page 1-2. Although the proposed 1000-foot-long weir section, with an elevation equal to the mean tide level, would allow overflow from mid-flood through mid-ebb in the tidal cycle, its functional value as a larval passageway has not been quantified. As proposed, the weir would be located adjacent to the shoreline and extend offshore joining the main jetty at a water depth of about 1 meter below mean sea level (based on adjusted depth contours following fillet formation as shown in Figure 1). Mean tidal ranges in the inlet are 0.6 to 0.7 m, thus, maximum water depths at the distal end of the weir would be around 2 m. Species composition, distribution, and abundance of larval fishes in such shallow water at ocean inlets is relatively unknown. Consequently, a substantially greater level of information and understanding of the processes involved is needed before assumptions concerning the benefits of a weir section can be supported.

Species composition, distribution (both horizontal and vertical), and abundance of larval fishes have been determined in previous studies conducted in deeper waters (5-10 m) in the vicinity of the ebb-tide delta at Oregon Inlet and other inlets. Observed variation in distribution and abundance suggests that the weir alternative may not benefit ingress of some species since they may not occur at depths found in the vicinity of the weir, or they enter the inlet in bottom water rather than upper level flows that are expected to pass through the weir.

The effect of reductions in the ingress of larval fish is also of concern with regard to fishery production and other ecological processes in Pamlico and Albemarle Sounds and surrounding waters. Field data collected by the National Ocean Service (NOS) and North Carolina State University (NCSU) researchers demonstrate that Oregon Inlet is a major migratory route for new recruits, particularly for species such as summer flounder and Atlantic croaker. Furthermore, based on discussion with Dr. John Miller of NCSU, there is evidence that immigration of larval fish through Oregon Inlet and into Pamlico and Albemarle Sounds could directly affect abundance of several commercially and recreationally important species.

Based on the preceding, research should be conducted to determine the distribution and abundance of larval fishes in the near-shore habitat, their relative contribution to the number of larvae which successfully migrate through the inlet, the utility of a weir to facilitate larval passage, and the correlation between larval ingress and production and harvest of commercially and recreationally important species. Furthermore, this research should be conducted prior to decision making concerning jetty construction since the needed information is essential to determine the full effect of the project.

1.02 Areas of Controversy

Page 1-3, paragraph 4. The issue of possible impacts on larval transport (ingress of subadult fish and invertebrates through Oregon Inlet) was first raised in the 1980s, and is largely unresolved for potential impacts and mitigation. Although development of plans to include a weir structure in the north jetty is most likely driven by cost reduction requirements, this modification is also intended to facilitate ingress of larval fish and invertebrates. While it is possible that a properly designed and positioned break in the jetties could improve larval passage, the current plan has not been sufficiently studied and its effectiveness is uncertain. As mentioned in the preceding comments, there is concern that a break or weir, if not properly designed and positioned, could actually exacerbate the larval migration problem by reducing influx of waters where the target species are concentrated.

The statement that up to a 10 percent negative impact on larval fishes would result from inlet modification must be prefaced with the uncertainties of that estimate as stated by the consultants who derived it (Mehta, A.J. and C.L. Montague. 1991. A brief review of flow circulation in the vicinity of natural and jettied inlets: tentative observations on implications for larval transport at Oregon Inlet, NC. University of Florida, Gainesville, FL. Under contract with COE, Wilmington District). Those authors explicitly state that, "in no way should the results of these calculations be interpreted as comprising the entire extent of the effects of Oregon Inlet modifications on larval transport" and that, "potentially significant impacts by no means can be ruled out." One reason for their justifiable caution is the lack of information on the species composition, distribution, and abundance of larval fishes in the surf zone. In this regard, they state, "a carefully designed program to determine near shore gradients of larval density under different wave conditions would be extremely valuable in calculating inlet impacts." Based on this and observations provided in our previous comments under page 1-2 Major Conclusions and Findings, the determination that the current project incorporates every feasible design feature to facilitate larval ingress is unsubstantiated.

There is also concern that the weir will not remain open, particularly during critical winter months when larval ingress includes highly desirable species. This concern is based on the Wilmington District's earlier determination (discussed below) that the weir would become landlocked. While this possibility is addressed by planned removal of accreted sand, this effort would necessitate rapid mobilization of ocean certified pipeline dredges and placing them in ocean waters during winter months when sea conditions are at their worst. This situation is referenced in the Wilmington District's 1995 Feature Design Memorandum for Sand Bypassing Management which, in rejecting plans for a weir states, "The major concerns, particularly with the weir jetty plan, were the high rates of littoral transport that could occur during singular or multiple storm events, and the possibility of reversals in the net direction of littoral transport during any year. Also, the amount of material available for bypassing would be limited to that retained in the sediment trap. With respect to storms, sand transport could be so large that the weir would become "landlocked," thus preventing the deposition of material in the sediment trap..."

Based on the preceding, the issue of larval fish/invertebrate passage is likely to remain controversial as long as an acceptable impact avoidance or minimization plan has not been developed and the range of reasonably foreseeable impacts are unknown and not described.

1.03 Unresolved Issues

Pages 1-3 and 1-4. The discussion of unresolved issues greatly underestimates the magnitude of the situation. Committing about 252 acres of land to jetty construction and sand bypassing alone is not minor, but this commitment is small in comparison to the possible effects of (1) erosion and overwash of vast areas of barrier island dunes and shallow water habitats, and (2) possible reductions in the migration of larval fish and invertebrates from ocean to estuarine waters. These effects are largely unresolved and poorly described.

To properly portray the unresolved issues, the document should fully describe beach erosion, island overwash, and other environmental effects including reductions in larval fish and invertebrate migrations (ingress through Oregon Inlet) that are reasonably foreseeable with jetty construction. The apparent decision not to fully describe these impacts inappropriately ignores the views of an impressive number of respected coastal geologists and marine scientists. We contend that the commitment to perpetually, and on a timely basis, bypass sand around the jetties is almost unparalleled in recent time in terms of its potential impact, and it must be treated accordingly. The ecological and economic effects of significant reductions in larval fish and invertebrate migration through the inlet could also have dire consequences and must be addressed as being reasonably foreseeable and potentially significant.

Regarding the preceding, we note that Section 1502.22 of the Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Parts 1500-1508) stipulates that, "reasonably foreseeable" impacts shall (emphasis added) be addressed if the analysis of the impacts is supported by creditable scientific evidence. Based on this requirement, and on evidence provided by DOI scientists and others that confirm the possibility of catastrophic environmental harm, information pertaining to (1) possible project-related effects as postulated by DOI and other scientists and (2) significant reductions in larval transport, must be provided. As stipulated in the Procedural Provisions of NEPA (40 CFR Parts 1500-1508) this information should include, but is not necessarily limited to: (1) a statement that such information is incomplete or unavailable (while incomplete, substantial information is available but not presented); a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing creditable scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

Comments provided in connection with Section 3.04 Mitigation (below) also apply.

Page 1-4. Matters involving special use permits to allow jetty construction and sand bypassing on lands that are managed by the DOI needs further treatment. In the absence of full disclosure of the project's potential effects on DOI lands and public trust resources, it will be necessary for the DOI to develop and address these consequences since such findings would be needed in connection with their permitting requirements. As mentioned in our General Comments, it is likely that issuance of a permit of this magnitude would be construed as a major Federal action. Considering that full

disclosure of reasonably foreseeable impacts is needed in connection with the proposed action and the DOI permit process, it should be provided in the SEIS. In this regard, consideration should be given to including the DOI as a cooperating agency for developing the assessment of project-related impacts on lands for which they have stewardship responsibility.

Item 2 in the list of considerations for the DOI compatibility decision is "an assessment by the Office of Management and Budget (OMB) of the current economic analysis and cost/benefit ratio." Considering that the NMFS has identified potentially serious flaws in the economic analysis, we request that our comments regarding project-related economics be forwarded to OMB for use in their review.

Page 1-5, Table 1-1. The proposed project is located in an area identified as Essential Fish Habitat (EFH) in the 1998 amendments to the Fishery Management Plans (FMP) prepared by the South Atlantic Fishery Management Council (SAFMC). This amendment was prepared in accordance with the 1996 amendment to the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265). The area also lies within the range of habitats used by summer flounder and bluefish identified as EFH by the Mid-Atlantic Fishery Management Council (MAFMC). The amendments are undergoing review by the Department of Commerce and upon approval, additional coordination with the SAFMC, MAFMC, and the NMFS is likely to be required since construction of jetties at Oregon Inlet could adversely affect EFH and species for which FMPs have been developed. As an indication of the level of coordination that would be required with approval of the SAFMC and MAFMC FMP amendments, the NMFS Interim EFH Final Rules (50 CFR Sections 600.805 - 600.930) require written response within 30 days of receipt of comments concerning effects on EFH and managed species, including receipt of those comments at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. The District's response would need to include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity and, if inconsistent with NMFS, SAFMC, and MAFMC EFH Conservation Recommendations, would require explanation of the reasons for not implementing those recommendations.

2.00 Purpose and Need

Pages 2-2 and 2-3. As noted in previous comments on the SGDM, the need for a 20-foot-deep by 400-foot-wide channel across the ocean bar was determined in response to a scenario that predicted massive fish and shellfish harvests by mostly deep-draft vessels requiring continuous capability to traverse the ocean bar at Oregon Inlet. This scenario, which was developed in the 1970s-80s, has been found to be grossly inaccurate. In fact, the fishery resources were never available, the projected fishing fleets were never needed, and the need for a 20-foot-deep/400-foot-wide channel never existed. As shown in recent analysis by the NMFS, all available fish can and are taken by vessels that traverse Oregon Inlet under current conditions, or by vessels using other ports and approaches.

This profound change in the purpose and need for the project needs to be addressed, especially for the alternatives analysis which, as presently presented, cannot possibly lead to determination of the most environmentally and economically sound alternative. As previously mentioned, our somewhat cursory analysis of the project, using actual conditions, costs, and benefits shows that the existing 14-foot Project or the No Action Alternative could possibly provide greater economic benefit than the Jetty Alternatives. This is explained in greater detail in our previous comments concerning Section 7 of the SGDM (Oregon Inlet Dredging Alternative -- Ocean Certified Pipeline Dredge) and is linked to the fact that the 20-foot-deep channel and the associated annual maintenance of 1,563,000 cubic yards of material are not needed. This view is substantiated on page 2-2 of the SEIS which acknowledges that the authorized depth of the bar channel is available about only 25 percent of the time, the channel width of 400 feet has never been attained, and the average annual volume of bypassed sand is about 560,000 cubic yards -- and by the fact that providing a 20-foot-deep channel will not increase fish landings. In addition, because most offshore fisheries are overcapitalized now, it is likely that fleet owners will consolidate operations and substantially reduce the number of fishing vessels. This could reduce the need for stabilization of Oregon Inlet.

3.00 Proposed Project

3.02 Sand Management Plan

Pages 3-3 (last paragraph) and 3-4. According to this section, "With revision of the jetty design, standard pipeline dredges may become an option to perform sand bypassing." This is an important consideration since the projected benefits would be substantially reduced if use of a standard pipeline dredge is not possible. Considering that this matter is apparently unresolved, it should be addressed in the benefit/cost analyses. Possible use of a booster pump is also mentioned in this section and should be addressed in the cost and overall economic analyses because the use of booster pumps can substantially increase dredging costs.

Page 3-7, paragraph 1. In connection with statements provided here and on page 5-4, paragraph 4 of the SGDM, the emergency sand sources appear to be unreliable. Considering that the material located off the north end of Pea Island is exposed to open ocean conditions, it seems improbable that this material could be used during winter periods when emergency conditions are most likely to occur. It also appears that material located in the flood tide delta are not reliable sand sources since, according to page 3-8 paragraph 4 of the SEIS, the influx of sand through the inlet will be eliminated with addition of the jetties. In any case, it is evident that the material located in the vicinity of the Bonner Bridge (the flood tide delta) would not be replenished once the jetties are in place and, therefore, cannot be viewed as a perpetual sand source even though the need, with jetties, will be unending. This leaves only the material located in the area between the jetties, or creation of borrow sites in protected estuarine areas that may support living marine resources. The adequacy of these remaining sites and the environmental consequences of using estuarine submerged and intertidal flats needs full disclosure.

Page 3-8, paragraph 4. According to this section, jetty construction will prevent "the continual influx of littoral sediment into the inlet." In addition to concerns raised in the preceding comments, we note that sand which is delivered through the inlet is the base material used in the formation and maintenance of tidal flats, coastal wetlands, and submerged aquatic vegetation (SAV) beds. These are some of the most productive habitats available and they are essential for sustained production of species such as shrimp, blue crab, blue fish, red drum, flounder, spot, Atlantic croaker, seatrouts, and other desirable fish and invertebrates. Considering that the project is expected to disrupt natural processes that created and maintain these habitats, the short- and long-term consequences of this change need to be identified and addressed in terms of environmental, ecological, and economic considerations. The current plan to monitor change and to provide needed mitigation through other environmental programs is not acceptable since the magnitude of the impact could be extremely large and could exceed the financial and engineering limits of this project and/or other programs under which mitigation may be performed.

3.04 Mitigation

The process to be used for identifying and formulating mitigation requirements is exceptionally general. As noted in preceding comments related to sand bypassing, there is no convincing evidence that funds, authority, or other requirements needed to assess impacts and mitigation needs, much less provide substantial mitigation, will be available. In the absence of a comprehensive and clearly workable mitigation plan, agreement to place irreplaceable lands and natural resources at serious risk is not an option for agencies having management and stewardship responsibilities over those lands and resources. As such, we urge that the Wilmington District not place the NMFS and other agencies in a position whereby they must either sanction or oppose a proposal that could cause accelerated beach erosion; loss of highly important forage, cover, and nursery habitat for valuable fish and invertebrates; and/or could significantly reduce the ingress of larval fish and invertebrates through Oregon Inlet. As noted in recent correspondence from Mr. Sam Hamilton, Director of the Southeast Region of the FWS (March 27, 1998, letter to LTC Youngbluth), that agency is also unwilling to place lands under its jurisdiction at risk by this project. As stated on page 5 of the enclosure provided with Mr. Hamilton's letter, "The Service opposes plans for stabilizing Oregon Inlet with hard structures. The Service has in effect determined that jetties, regardless of the design, should not be the preferred alternative for achieving desired navigation capabilities through Oregon Inlet."

Based on the preceding, the NMFS does not believe that an acceptable level of impact avoidance, minimization, and compensation would be afforded based on the information presented in the SGDM/SEIS. It is also evident that the ability to build jetties and to identify and possibly provide considerable mitigation could far exceed the scope of the Manteo (Shallowbag Bay) Project in terms of its purposes, authorities, impact assessment, and economic feasibility. This should be acknowledged and addressed.

We agree that pre- and post-project monitoring of an extensive area and resource base is needed to fully comprehend and evaluate project induced change and impacts. However, such monitoring cannot preempt disclosure of reasonably foreseeable impacts or inadequacies of the mitigation plan

related to legislative, engineering, and economic requirements that must be met before irretrievable commitments of funds and resources are made. Accordingly, our comments on the Environmental Monitoring Program should not be construed as agreement that monitoring can be used to circumvent NEPA requirements, or that we agree to a process that postpones determination of mitigation needs and requirements until after an irreversible commitment of lands and resources has been made.

Pages 3-15 and 3-16. This section acknowledges and supports the joint DOI/COE Task Force determination that, "many potential project effects were unquantifiable or unmitigatable." There is also apparent acknowledgment that planned creation of 125 acres of oyster reef may not sufficiently offset all project-related impacts. To address these unquantifiable and/or unmitigatable impacts, the use of an Environmental Monitoring Plan is proposed.

As previously stated, reasonably foreseeable significant impacts must be addressed prior to project implementation and, in fact, should be analyzed as part of the decision making process required by NEPA. The commitment to monitor project effects and, following project construction, address identifiable impacts "through additional mitigation or through other environmental improvement authorities" (page 2-16, paragraph 2) is unacceptable and seems to contravene NEPA requirements regarding disclosure of impacts and mitigation needs.

Page 3-16, paragraph 3. This section of the document acknowledges that the true effects of the project, hence the need for mitigation, cannot be determined until the jetties are in place and post construction monitoring has occurred. This thought is expressed in the last sentence of this paragraph which states that, "only when project induced changes drive the resources of concern outside of the established limits of natural background variation would additional mitigative actions become appropriate." Considering that the first sentence in this paragraph states that, "Because the background environment is inherently dynamic under existing conditions, the base condition, from which future changes will be determined, will be difficult to establish." it appears that results of the monitoring effort could be inconclusive. This substantiates our view that essential information regarding impacts is lacking and cannot be fully provided through pre- and post-construction monitoring. Again, we call upon the Wilmington District to reveal all reasonably foreseeable significant impacts and mitigation requirements that have been identified by the scientific community and in relevant scientific documents and reports such as those provided by the DOI.

Page 3-16, paragraph 4. This paragraph identifies general categories of natural resources that are "deemed to have significance within the area of project influence." Although addressed in the Environmental Monitoring Program, the larval fish and invertebrates that migrate through Oregon Inlet should be identified as a significant resource. This is especially true in light of the possibility that, with the jetties, a 10 to 60 percent reduction in the number of larval fish and invertebrates that would successfully negotiate the inlet may occur.

Page 3-17, paragraph 4. With construction of the Wanchese Harbor Project in 1981, 42 acres of *Juncus roemerianus* marsh was permanently eliminated. Although initially a component of the Manteo (Shallowbag Bay) Project, harbor development was implemented following determination

by the Wilmington District that the work could be fully implemented based on its own merit. Considering that the project was disassociated from Oregon Inlet stabilization and related channel work, it is inappropriate to continue to link mitigation needs of that project to inlet stabilization. Consequently, the long-promised mitigation should be provided without further delay. In addition, compensation is needed for the 18 years of temporal loss of productivity and habitat functions that was caused by linking this mitigation to inlet stabilization. These matters should be addressed in the SEIS and resolved immediately through a separate process.

3.04.3 Environmental Monitoring

Page 3-18, paragraph 2. The SEIS correctly acknowledges that monitoring of project-induced impacts is needed. While a positive feature of the SEIS, this does not alleviate the need for full disclosure of reasonably foreseeable impacts or of costs of monitoring and possible corrective action that could be required. As noted in previous comments pertaining to the overall mitigation proposal, monitoring cannot be used in lieu of disclosing the full range of reasonably foreseeable impacts of each alternative. It also should be demonstrated that the mitigation required to sufficiently offset project-related impacts is within legislative, engineering, and economic limits of the project.

Page 3-18, step 1. The list of natural resource concerns provided in Section 3.04.1 and referenced in this section is incomplete. The physical parameters and biological resources identified in step 1 should be included in the Monitoring Program.

Page 3-19, step 2. Establishing the baseline conditions for the physical parameters and biological resources identified in Step 1 could require several years and major investments of money and personnel by the COE and participating agencies. Greater detail is needed on the level and type of monitoring and sampling that is anticipated, including descriptions of anticipated products and costs. Discussion is also needed on what action will be taken if agreement cannot be reached on the scope or acceptability of the monitoring effort and mitigation needs.

Page 3-19, step 3. An estimate of the scope of work and costs is needed. Based on the information provided in this section, it appears that sampling of pelagic fish, plankton, and benthic dwelling organisms is not anticipated. This needs to be explained since these are broad categories and could preclude essential sampling. Additional information is also needed on the range of habitats and species that will be monitored. Also, the document suggests that the abundance, diversity, migration, and distribution of larval and surf zone fishes should be monitored over three year cycles after establishing baseline conditions. Based on an ongoing NMFS larval fish monitoring program (currently in its' 14^{th} year) inside Beaufort Inlet, annual estimates of larval abundance can vary by nearly 500 percent. With natural variability of that magnitude and no long-term data from Oregon Inlet, establishing reasonable baseline conditions would be a difficult task. If the baseline condition is not properly determined, then identification of significant changes in natural variation in the larval community, much less changes produced by the jetties, will be impossible to determine.

The NOAA/NOS Center for Coastal Fisheries and Habitat Research, recommends implementation of the following studies prior to decision making on the proper course of action at Oregon Inlet:

1). Determine seasonal species composition, horizontal and vertical distribution, and abundance of larval fishes in the nearshore zone extending from mean sea level offshore to a depth of 10 meters in the project area. (Estimated cost: $65K).

2). Determine the effectiveness of a similar weir jetty system as a passageway for larval organisms. There are currently five weir jetties in place in the U.S. including the system located at Masonboro Inlet, NC. A study of larval fish immigration into Masonboro Inlet, NC would provide information on the relative contributions of the weir section and main pass to larval ingress. (Estimated cost: $75K).

Pages 3-19 through 3-20, STEP 4. Considering that mitigation needs will be determined based on observed change from the baseline condition, details should be provided concerning methodologies that will be utilized to assess change. This should include information on the role of the participating agencies on resolution of disagreement concerning interpretation of observed environmental change and the type and level of mitigation that is required. Since we are unaware of measures that could be used to offset significant reductions in larval transport, the COE's willingness and authority to shorten or remove the jetties should also be addressed. (See related comments, below).

Page 3-20, STEP 5. From the list of possible mitigation options provided, it appears that modification of the jetties, as would be required to avoid significant declines in larval transport, may not be possible. If so, then it should be acknowledged that related monitoring is intended for impact assessment purposes and has no application to mitigation. Discussion is also needed concerning possible costs and funding sources for needed mitigation and the relationship (effect) of all reasonably foreseeable mitigation needs on project-related costs and benefits.

Page 3-20, STEP 6. The NOS Beaufort Laboratory, should be identified as a possible participant in studies involving living marine resources and the aquatic environment.

4.00 Alternatives

4.01.1 Hopper Dredging Plan

Pages 4-1 through 4-5. The alternative analysis is misleading because it relies on the unfounded assumption that a 20-foot-deep by 400-foot-wide navigation channel is needed at the ocean bar. These channel dimensions and associated annual bypassing of about 1.5 million cubic yards of sand greatly exceed channel dimensions that provide for harvest of almost all of the available fish taken by commercial fishers at Oregon Inlet. Consequently, the Dredging Alternatives and associated costs of between $8 million and $10 million are not relevant except as possible evidence that the needs for navigation, identified in the 1970s, would have been enormously costly and difficult to provide. As noted previously, the number of offshore fishing vessels may decline substantially as fleet owners consolidate operations to reduce costs. Again, we call upon the Wilmington District to

address the Dredging Alternatives in terms of actual conditions and needs of the fishery and related navigation requirements of vessels suited for use at Oregon Inlet and in the absence of jetties and extreme channel dimensions.

Considering that the current plan has no relevance in terms of existing needs or feasibility, it detracts from the decision making process and should be eliminated. If the analysis is retained, it should be analyzed in terms of channel dimensions needed for the current fishery. Information provided in Section 4.01, page 4-1 of the SEIS which illustrates that properly placed dredged material may migrate onshore, also should be included in the analysis. Finally, the benefit/cost analysis should consider actual costs and fish landings -- not those of the 20-foot/400-foot channel. In the absence of these changes, it should be clearly noted that the plan was designed to address requirements that no longer exist and that it has no relevance to existing navigation needs at Oregon Inlet.

Page 4-2, paragraphs 3 and 4. Reference to the need for a 20-foot-deep and a 32-foot-deep channel has no relevance to current requirements needed for commercial fishing and navigation through Oregon Inlet. Similarly, comments concerning the volume of material that must be dredged and bypassed are no longer valid and should not be included in the analysis.

Page 4-3, paragraph 2. Comments under Page 4-2, paragraphs 3 and 4 also apply.

Page 4-3, last paragraph/Page 4-4, paragraph 1. Determination that the DOI/COE Task Committee dredging alternative would require excavation of an overly deep channel has no relevance to current requirements needed for commercial fishing and navigation at Oregon Inlet. Similarly, comments concerning the volume of material that must be dredged and bypassed are no longer valid and should not be included in the analysis.

Page 4-4, last paragraph. See previous comments regarding page 4-3, paragraph 2.

4.01.2 Ocean Certified Pipeline Dredging Plan

This Plan, like the Hopper Dredging Plan, is not relevant because it is based on needs (the 20-foot-deep/400-foot-wide ocean bar channel involving annual removal of 1.5 million cubic yards of material and continuous sand bypassing) that are no longer necessary based existing requirements of the fishing industry. Continued use and analysis of this alternative is inappropriate and detracts from the decision making process. As such, it should be eliminated. If retained, it should be clearly noted that the plan was designed to address requirements that no longer exist and does not apply to existing navigation needs at Oregon Inlet.

Considering that the Plan no longer applies to current requirements for fish harvest and navigation maintenance at Oregon Inlet, all references to costs for constructing and maintaining a 20-foot-deep by 400-foot-wide channel are not relevant. As such, they should not be used in the alternatives analysis or in cost comparisons found in the SGDM/SEIS.

Page 4-6. Again, the need for a 20-foot-deep channel no longer applies to current requirements needed for commercial fishing and navigation at Oregon Inlet. Similarly, comments concerning the volume of material that must be dredged and bypassed are no longer valid and should not be included in the analysis.

4.02 Jetty Alternatives

Although not mentioned in this section, page 3-30 of the SGDM states that the concrete barrier used to preclude sand movement through the jetties was eliminated because, "sand tightness" is no longer required with the addition of the weir. Considering that the volume of sand involved is substantial, and that sand migrates in both directions (north to south/south to north), it would appear that uncontrolled sand flow through the jetties could interfere with navigation and possibly create the need for additional dredging. It also appears that a portion of this material could be lost from the littoral zone because, upon entering the jettied inlet, it might be carried offshore by ebbing tides and deposited in depths from which inshore movement is no longer possible. This would exacerbate shoreline erosion.

Our concern is substantiated by information found in the Phase II SGDM Appendices 1 through 5 which state, "Since the primary purpose of a jetty is to prevent littoral materials from entering the inlet, thus assuring a stable and navigable channel, it is essential that each structure be made impermeable to sand transport. The degree of sand impermeability necessary to accomplish this goal cannot be realized by the placement of stone and artificial units alone due to the voids present between the individual units, particularly true of the relatively large units proposed for Oregon Inlet."

Page 4-13, paragraph 1. Reduction of the jetty lengths to 2000 feet (from the adjusted shoreline) represents a significant change in the Jetty Alternatives. This change follows corrections in the projected fish landings that substantially reduced the project's economic benefit and, in the absence of the length reductions and other changes, would have resulted in a highly unfavorable benefit/cost situation. Considering that the earlier length requirements were rigorously defended by the Wilmington District and that the magnitude of change is substantial, we are concerned over the possibility that the jetties could require extension at some future date. If reasonably foreseeable, this possibility, including associated costs and environmental effects, needs to be fully addressed.

Page 4-13, paragraph 2. As with the case of reducing the length of the jetties, the decision to include a weir structure is apparently linked to the need to reduce construction costs in light of reduced benefits (anticipated fish landings). Considering that the Wilmington District rigorously defended its earlier analysis that precluded the use of a weir, it appears that the current design could require modification. If reasonably foreseeable, this possibility, including associated costs and environmental effects, needs to be fully addressed. Also, since the document states that the chief advantage of the weir is to allow larval ingress, our comments provided in connection with Section 1.01 Major Conclusions and Findings also apply.

We also note that use of an ocean certified pipeline dredge would be required to remove sand accretions in the vicinity of the weir. If not removed, the weir could become landlocked and sand migration into the catch basin located inside of the jetties would cease. Considering that sand bypassing must occur on a timely and as needed basis, and that dredges cannot operate in open seas during winter months (when sand movement is most prevalent), it appears that substantial beach erosion is possible. While potentially significant under normal winter conditions, it would appear that erosion could reach catastrophic proportions with severe storms such as late season hurricanes and other major events such as the Ash Wednesday Storm and the Storm of the Century that are referenced in the SEIS. These issues need to be fully addressed.

4.05 No Action

Page 4-17. The description of the No Action Alternative is seriously inadequate and misleading. As mentioned in previous comments, efforts to establish and maintain a 20-foot-deep by 400-foot-wide channel across the ocean bar do not apply to existing commercial fishing operations that rely on Oregon Inlet. Consequently, evaluation of this alternative using outdated and excessive requirements, and ignoring facts related to actual needs and conditions, is not acceptable and has created a situation whereby the alternatives analysis serves almost no useful purpose in identifying environmental impacts, costs, or economic benefits. This is addressed in detail in our previous comments pertaining to Section 7 of the SGDM and our cursory analysis of the economic benefits which indicates that the existing 14-foot Project and/or the No Action Alternative could have a slightly higher economic benefit than the jetty plan. These matters must be addressed.

Considering that the environmental consequences of jetty construction, as postulated by DOI and other scientists, have not been fully disclosed or properly addressed in the SGDM/SEIS, it is not possible to properly evaluate the relationship between the Jetty Alternatives and the existing 14-foot Project and the No Action Alternative. While it is apparent that maintaining the existing condition would preclude any possibility of catastrophic erosion and related damage, the relative importance of this is not explained in the SEIS and, consequently, the document cannot be used to identify the most appropriate course of action on economic benefits and providing a suitable level of environmental protection. To correct these deficiencies, the following information is needed:

1. An objective analysis of the costs/benefits of the 14-foot Project and the No Action Alternative that is based on actual dredging needs, costs, and benefits [i.e., not based on channel dimensions (20-foot-depth; 400-foot-width) and dredging (1.5 million cubic yards) that was deemed necessary to support a fleet requiring uninterrupted access between Wanchese and the fishing grounds]; and

2. A comparison of the range of environmental impacts that are possible with the Jetty Alternatives and the 14-foot Project and the No Action Alternative.

4.06 Conclusions

The determination that, “maintenance of the authorized improved channel dimensions without jetties would not be cost effective” is relatively meaningless since other potentially viable alternatives are not evaluated. The analysis used to reach this conclusion does not consider that the “required” channel dimensions do not apply to actual needs at Oregon Inlet, nor does it consider that an even greater economic benefit may be possible in connection with the existing 14-foot Project or the true No Action Alternative. As presented, the conclusions also imply, without proof, that vessel damage and loss of life will be eliminated or significantly curtailed by jetty construction.

The statement that, with inclusion of the weir, “unquantifiable” fishery benefits would be realized is problematic. In reality, a properly designed and positioned weir could lessen effects on larval fish ingress caused by jetties, but this cannot be construed as being an unquantifiable benefit.

5.00 Affected Environment

5.02.2 Erosion Thresholds

Page 5-4 and 5-5. According to this section, beach nourishment would be required to offset construction of the NCDOT’s terminal groin located on the north end of Pea Island if erosion rates exceed natural erosion rates by either 250,000 cubic yards within a one mile range of the groin, or 500,000 cubic yards within three miles of the structure. It is also noted that since the groin was built in 1989, beach nourishment has not been required. Considering that acceptable erosion limits have been maintained for about ten years, it appears that the existing 14-foot Project is not causing significant shoreline erosion in the area of Pea Island. The impacts of the existing project are vastly different than those that could occur with the Jetty Alternatives. This difference in potential impacts needs to be fully addressed in discussions on the 14-foot Project and the No Action Alternative.

5.02.5 Historic (Background) Shoreline Change Rates on Bodie and Pea Islands

Page 5-6, paragraph 2. The statement that, “removal of dredged material from the bar channel without depositing the material directly on the beach (emphasis added) could lead to increased erosion of the north end of Pea Island” contradicts the following determination, found on page 4-1, paragraph 3 of the SEIS: “Limited monitoring of the 1996 disposal area off of Pea Island indicated that the material was moving onshore. This was supported by DOI’s sand analysis which concluded that material from the (offshore) dump area was working its way on to the immediate foreshore. Beach profile surveys of Pea Island have also shown no negative impacts

of the operation."

Additionally, the statement that, "the erosion rates that have occurred since 1984 on the north end of Pea Island, whether related to the dredging activity or not, are considered to be inordinately high and are not representative of previous ong-term rends," is problematic. It implies that nabnormally high rate erosion is occurring and could be related to dredging. This seems to contradict the most recent shoreline monitoring results (designed to detect shoreline change resulting from the terminal groin) which indicate that recent erosion is inconsequential. This discrepancy needs to be explained.

5.05.3 Larval Fishes

Pages 5-12 and 5-13. The remarks attributed to Dr. John Miller that larvae in the ocean generally travel westward until they encounter the shoreline, then migrate along the shoreline until they encounter the inlet needs clarification. This implies that larvae are in the nearshore surf zone (i.e., shoreline). Since this may not be the case, some reference as to the actual water depth at the shoreline and the species that occur at that location should be provided.

6.00 Environmental Effects

This section reiterates statements and conclusions that are presented in previous sections of the SEIS. In response to these statements and conclusions, the NMFS has provided detailed comments which show that the document (1) fails to sufficiently disclose and describe the magnitude of environmental harm that is possible with the Jetty Alternatives; and (2) inaccurately depicts the 14-foot Project and the No Action Alternative as being costly, unreliable, and environmentally damaging. Lacking full disclosure of reasonably foreseeable effects of the selected alternative, and in the absence of a complete and objective analysis of the economic and environmental consequences of the 14-foot Project and the No Action Alternative, the purposes of the NEPA cannot be fulfilled. Consequently, there is no basis for determining that the Jetty Alternatives are either economically viable or acceptable in terms of impacts to living marine and other resources that are of enormous value to North Carolina and the Nation.

6.06.3 Larval Migration

Pages 6-14 through 6-17. Again it is stated that the weir would facilitate larval ingress for those larvae found in the immediate nearshore zone. Our comments under Section 1.01 Major Conclusions and Findings also apply.

This section also states that larvae located elsewhere in nearshore waters would successfully enter the inlet through the main channel between the jetties. Previous studies of flows in the vicinity of jettied inlets have shown that areas of "dead water" may occur along the jetty flanks and larvae which become trapped in these zones may be lost to the system. This should be addressed.

6.14 Uncertainties

Page 6-33, Item 3. As noted, detecting project-related impacts on larval fishes will be particularly difficult. The NMFS concurs with this determination and we refer to our previous comments on 3.04.4 Environmental Monitoring Program.

Appendix B: U.S. Fish and Wildlife Coordination Act Report (sic)

The report provides a good overall account of longstanding concerns and potential impacts of jetties on larval fish migration. However, matters pertaining to the distribution of larval fishes in and around inlets, and the value of a nearshore weir as a migratory passage need further consideration based on studies conducted at Oregon Inlet, Ocracoke Inlet, and Beaufort Inlet by researchers at the NOS Beaufort Laboratory. Regarding spatial distribution of winter-spawned estuarine-dependent larvae occurring in the offshore approaches to inlets and within the inlet proper, the NOS found that larvae are not equally distributed around the inlet delta or in the pass. Samples collected along the delta in depths ranging from 4.6 to 7.6 meters (15 to 25 feet) show that larvae are often abundant at these depths. Also, larvae tend to be more abundant on the upcurrent approach to the inlet indicating that most are poised to enter the inlet from a lateral longshore direction and not via the main navigation channel. Within the inlet throat it was found that larvae may be three times more abundant along the inlet edge than in mid-channel. Several kilometers offshore from the inlet, larval abundance is quite variable and probably reflects the movements of discrete patches of organisms. Although larvae can be abundant in relatively shallow waters near the inlet, abundance in the surf and near-shore zones is undetermined. Therefore, the value of a weir as a pathway for larval ingress, when located in depths of less than 2 meters (as shown in Fig. 14 of the report), is highly questionable.

CONCLUSION

As written, the SEIS cannot be used for determination of alternatives that properly balance economic development and environmental quality. The 14-foot Project, the No Action Alternative, and the Dredging Alternatives include unrealistic and unnecessary conditions for success, and the Jetty Alternatives do not consider the possibility that reasonably foreseeable impacts of catastrophic proportion are possible. Mitigation for jetty related impacts is linked to monitoring that, according to the document, relies on determination of baseline conditions that are difficult, if not impossible, to ascertain. The low economic benefit of the Jetty Alternatives also greatly limits the level of mitigation that could be forthcoming in connection with this alternative and there is no assurance that mitigation could be provided through other actions or authorities, as is proposed. The costs of environmental monitoring and reasonably foreseeable mitigation are also unknown, hence it is not possible to determine if the project is economically viable with mitigation. The relatively benign environmental effects of the 14-foot Project and the No Action Alternative are not described in comparison to those of the Jetty Alternatives and an objective benefit/cost analysis of the 14-foot Project and the No Action Alternative is not provided. Finally, there are serious flaws in the economic analysis for the Jetty Alternatives, and claims that jetties are considerably safer and would reduce vessel damage are unsubstantiated.

Considering the absence of a reasonable and objective alternatives analysis and the magnitude of omissions and inaccuracies in previous environmental documents and the current supplements, compliance with stated purposes of the NEPA of 1969, as amended, is not possible. The potential for significant and adverse long-term impacts to nationally important living marine resources is such that the NMFS has no recourse, but to recommend that jetties not be built. Nationally important fishery resources are at stake with the Manteo (Shallowbag Bay) Project and the NMFS may, depending on the proposal adopted in the Final SEIS and supporting information, refer this project to the Council on Environmental Quality under Section 1504 of the Council's Regulations for implementing the Procedural Provisions of NEPA.

In accordance with the Endangered Species Act of 1973, as amended, it is the responsibility of the appropriate Federal regulatory agency to review its activities and programs and to identify any activity or program that may affect endangered or threatened species and their habitat. If it is determined that these activities may adversely affect any species listed as endangered or threatened, formal consultation with our Division of Protected Resources must be initiated. The appropriate contact for matters pertaining to protected species is Mr. Charles Oravetz who may be contacted at the letterhead address or at (727) 570-5312.

Sincerely,

Andrew J. Kemmerer
Regional Administrator

cc:
FWS - Atlanta
FWS - Raleigh
EPA - Miller
NPS - Spencer
SAFMC - Pugliese
MAFMC - Hoff
PSP - Fruchter/Schreiber
F/SERx1
F/SER23 - Eldridge
F/SER3
F/SER41
F/SER45
F/HP1
NOS, Beaufort Laboratory - Hoss/Thayer/Settle