NPS Errors (E), Omissions (O), & Misrepresentations (M) concerning impact of DBOC on harbor seals in Drakes Estero by NPS Superintendent Don Neubacher and Scientist Dr. Sarah Allen in comparing: (i) testimony by Neubacher and Allen to Marin County Board of Supervisors on May 8, 2007, and (ii) Neubacher's Drakes Estero Report (*Drakes Estero: A Sheltered Wilderness Estuary*) on May 8 & 11, 2007 to explanation by (iii) NPS Scientist Benjamin Becker to Ocean Studies Board (NRC) panel on Sept 4, 2008 and by (iv) Regional Director Jon Jarvis in his document to NRC panel on Sept 24, 2008

EOM#	Becker presentation to NRC on Sept 4, 2008 & Jarvis document to NRC on Sept 24, 2008	E	O	M
1	**Dr. Sarah Allen's May 8, 2007 testimony.** *"The harm* [from the oyster farm] *is resulting in abandonment of one area where more than 250 seals, including 100 pups two years ago occurred in that spot. This year chronic disturbance and placement of bags on the nursery area has caused an 80% reduction in the seals dropping to around 35 this last Saturday."* On Sept 4 & 24, 2008, NPS Becker and Regional Director Jarvis (verbally and in writing, respectively) claimed Allen cited subsite OB and referred to three years ago (2004 vs. 2007). The NPS database shows Allen unambiguously cited sandbar A which contains no oyster operations.	**X**		**X**
2	**Superintendent Don Neubacher's May 8 & 11, 2007 Drakes Estero Report.** Superintendent Neubacher's May 8 & May 11, 2007 Drakes Estero Report states: *"One area where 250 seals nursed more than 100 pups two years ago have around 50 total seals including around 25 pups in 2007, an 80% decline."* These claims are similar to Allen's May 8 testimony and to Gordon Bennett's (Sierra Club) May 1 article in the Coastal Post. On Sept 4 & 24, 2008, NPS Becker and Regional Director Jarvis (verbally and in writing, respectively) claimed NPS cited subsite OB in May of 2007. These were false statements. NPS and Bennett unambiguously cited sandbar A.	**X**		**X**
3	**Sandbar A vs. subsite OB.** In public testimony and written documents on May 8 & 11, 2007, NPS Neubacher and Allen cited sandbar A when they described with some urgency the impact of DBOC *"recently", "this year", "right now*", and *"in 2007"* in causing an 80% decline in harbor seals compared to "*two years ago".* Neubacher said changes in oyster operation in 2007 had caused *"… a serious problem right now".* The decline at sandbar A occurred from 2006 to 2007. Oyster operations get nowhere near sandbar A. For 16 months NPS remained silent about which subsite they cited, refusing in June 2007 to answer the question submitted by FOIA request in May 2007. On Sept 4 & 24, 2008, NPS Becker and Jarvis claimed NPS cited subsite OB and referred to three years ago. But the decline at subsite OB occurred between 2004 and 2005 (as numbers returned back to the eleven-year mean from the 2004 high), and remained relatively constant from '05 to '07. There was no change at subsite OB in '07. There was nothing urgent at subsite OB to alert the Marine Mammal Commission. Rather, NPS cited numbers from sandbar A in May '07.	**X**		**X**

EOM#	Becker presentation to NRC on Sept 4, 2008 & Jarvis document to NRC on Sept 24, 2008	E	O	M
4	***"Two years ago."*** Superintendent Neubacher's May 8 & May 11, 2007 Drakes Estero Report, and Dr. Allen's May 8 testimony, explicitly referred to a single subsite in which seals had declined by 80% in 2007 compared to *"two years ago"* (2005). In Becker's Sept 4, 2008 presentation to NRC panel, and Jarvis' Sept 24, 2008 NPS document, they claimed Allen cited 2004 vs. 2007 (three years ago) and a decline at subsite OB. This was false claim. It had nothing to do with DBOC. Decline at OB was from 2004 to 2005, not 2005-2007 (DBOC ownership started in 2005). Mean number of seals at subsite OB from 2005-2007 was at eleven-year mean.	**X**	**X**	**X**
5	***"80% decline."*** Neubacher's May 11, 2007 Drakes Estero Report, and Allen's May 8 testimony, explicitly referred to a single subsite at which seals declined by 80% in 2007 compared to two years ago. In Becker's Sept 4, 2008 presentation to NRC panel, he claimed Allen cited subsite OB which had a 55% decline from 2004 (not 2005) to 2007. Jarvis' Sept 24, 2008 NPS document claimed Allen cited only data up until May 3, 2007, while maximum for year was on May 4, 2007. On September 4, 2008, Becker explicitly told NRC panel that Allen cited May 4, 2007 data from subsite OB which was season high; Becker quoted numbers he got from Allen. On September 24, 2008, Jarvis told the NRC panel a different story. Both were false. In Allen's May 8, 2007 testimony, she cited data from May 5. Surely she had looked at May 4, and had not stopped at May 3 and jumped to May 5. In May 2007, Allen cited data from sandbar A, not subsite OB.	**X**		**X**
6	***"… around 35 this last Saturday."*** This quote comes from Dr. Allen's May 8, 2007 testimony to the Marin County Board of Supervisors. The last Saturday before the hearing was Saturday May 5. *"around 35"* seals is very close to the maximum number of seals observed that day at sandbar A (33) , and far different from the maximum number of seals obserbed at subsite OB (82). Becker on September 4, 2008, and Jarvis on September 24, 2008, claimed that Allen was citing subsite OB in her May 8, 2007 testimony. Both were making false claims. She cited sandbar A.	**X**		**X**
7	***"…around 50 total seals including around 25 pups in 2007 …"*** Superintendent Neubacher's May 8 & May 11, 2007 Drakes Estero Report states: *"One area where 250 seals nursed more than 100 pups two years ago have around 50 total seals including around 25 pups in 2007, an 80% decline."* On Sept 4, 2008 and on Sept 24, 2008, Becker and Jarvis (respectively) said NPS had referred to subsite OB in May of 2007. These were false statements. In 2005, two years prior to 2007, subsite OB had a maximum of 62 pups while sandbar A had a maximum of 104 pups. 104 is "*more than 100*"; 62 is not. In 2007, OB had a maximum of 157 seals on May 4. In 2007, sandbar A had a maximum of 39 seals, much closer to *"around 50"* than the 157 seals at subsite OB on May 4. Neubacher's numbers correspond to sandbar A and not subsite OB.	**X**		**X**

EOM#	Becker presentation to NRC on Sept 4, 2008 & Jarvis document to NRC on Sept 24, 2008	E	O	M
8	**Gordon Bennett's (Sierra Club and others) May 1 article in the Coastal Post.** Sierra Club's Gordon Bennett's May 1, 2007 article in the Coastal Post stated: *"In the past, as many as 300-500 seal pups were born annually in the Estero, 100-200 of which use the middle sandbars. Now that oyster operations have expanded and oyster bags are placed in seal nursery areas, baby seal numbers on the middle sandbars have been reduced to about fifty in 2006 and less than 10 pups so far in 2007."* Bennett repeated the same claims in the July 2007 issue of the Sierra Club Yodeler. On Sept 4 & 24, 2008, Becker and Jarvis (respectively) said that NPS had referred to subsite OB in May of 2007. Bennett, Neubacher, and Allen made the same claims in May of 2007. All three cited a dramatic decline in seals between 2005 and 2007 at an unnamed subsite. All three cited specific numbers for 2007 at the unnamed subsite. All three cited a problem of urgency due to recent changes in the oyster operation. All three were citing numbers and events that corresponded precisely to sandbar A. NPS recent claims that they had cited subsite OB were false. The decline at OB occurred between 2004 and 2005; the decline at sandbar A occurred between 2005 and 2007. The numbers cited were unambiguously from sandbar A.	**X**		**X**
9	***"middle sandbars"*** Sierra Club's Gordon Bennett's May 1, 2007 article in the Coastal Post stated: *"In the past, as many as 300-500 seal pups were born annually in the Estero, 100-200 of which use the middle sandbars. Now that oyster operations have expanded and oyster bags are placed in seal nursery areas, baby seal numbers on the middle sandbars have been reduced to about fifty in 2006 and less than 10 pups so far in 2007."* On Sept 4 & 24, 2008, Becker and Jarvis (respectively) said that NPS had referred to subsite OB in May of 2007. Bennett, Neubacher, and Allen made the same claims in May of 2007. These were false statements. Bennett clearly cited sandbar A. In the Department of Interior Inspector General's report of July 21, 2008, Bennett is quoted as saying that he got this unpublished information from Sarah Allen. Bennett's numbers precisely described sandbar A and not subsite OB. Bennett's numbers were very similar to Allen's and Neubacher's numbers. Bennett got his numbers from NPS. Bennett referred to the *"middle sandbars".* In slide #4 in Becker's presentation to the NRC panel on Sept 4, 2008, he graphically defined subsites UEF, OB, & UEN as the "*upper*" subsites, subsites DBS, DEM, & L as the "*lower*" subsites, and subsites A & A1 as the "*middle*" subsites. In his verbal presentation, he called sandbars A and A1 the middle sandbars. In Jarvis' document to the NRC panel on September 24, 2008, he refers to sandbar A as a middle subsite. Bennett cited the middle sandbars. His numbers were precisely middle sandbar A.	**X**		**X**

NPS Errors (E), Omissions (O), & Misrepresentations (M) by NPS Scientist Benjamin Becker to Ocean Studies Board (Natl. Res. Coun., NAS) on Sept 4 2008 in presentation: *"Models for Harbor Seal Counts in Drakes Estero"* based upon Becker, Press, & Allen paper in press in journal Marine Mammal Science: *"Modeling the Effect of El Nino, Density-Dependence and Disturbance of Harbor Seals in Drakes Estero, California, 1997-2007"*

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
1	**Title of Becker's presentation and paper.** Title states "Drakes Estero". This is not accurate. Does not model the seal counts for Drakes Estero. Becker restricted analysis to a few subsites.		**X**	**X**
2	**Title of Becker's paper.** Title states "1997-2007". This is not accurate. Becker restricted analysis to 2002-2004 vs. 2005-2007 to artificially focus on decline from 2004 to 2005 at subsite OB. Becker made it appear as if decline occurred during DBOC years, but DBOC began in 2005.		**X**	**X**
3	**Scope of Becker's presentation and paper.** Becker failed to include data on all 8 subsites in Drakes Estero. Becker restricted analysis to three of eight subsites (UEB, OB, UEF), the only ones with oyster bags. Thus he had no control sites without oyster operations for comparison.		**X**	**X**
4	**2008 data available but not included.** Becker failed to include 2008 data on harbor seals (peak season Apr 15-May 15) and oyster production. Becker had 2008 data, or access to it, for over 3 months. Becker claimed his model is predictive. 2008 data contradict his model: seals at OB went up while oyster production went up. In fact, seals at OB did not go down from 2005-2008.		**X**	**X**
5	**Oyster production.** Becker's presentation & paper used the wrong number. Shellfish production in Drakes Estero overstated for 2007 by 63%, and 2007 vs. 2006 overstated by 267%. Data was available from California Dept. of Fish & Game. Becker failed to get correct numbers from CDFG.	**X**		**X**
6	**Oyster production.** Becker's presentation & paper used oyster production number for all of Drakes Estero, and falsely assumed it was representation of changes at subsites UEN, OB, and UEF, which it was not. Failed to get shellfish production data on specific subsites from DBOC.	**X**	**X**	**X**
7	**Oyster production.** Becker's presentation & paper falsely assumed that as oyster production in all of Drakes Estero increased, oyster operation activity at specific subsites (e.g., OB) increased proportionally, which it did not. Becker wrote: "*The oyster harvest factor is assumed related to boat traffic, human activity, and oyster bag placement that may displace or disturb seals"*. This assumption was wrong. Becker failed to get subsite data on boat activity and bags from DBOC.	**X**		**X**
8	**Oyster production.** Becker's presentation & paper falsely assumed that oysters reside in oyster bags on sandbar islands (UEN, OB, UEF) for 18 months. They do not. Oysters are "finished" for three to four months in oyster bags at these subsites. Failed to get information from DBOC.	**X**	**X**	**X**

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
9	**Oyster production vs. harbor seals.** Because Becker presentation & paper falsely assumed that oysters reside in oyster bags on sandbar islands (UEN, OB, UEF) for 18 months, which they do not, he falsely assumed that oyster production in given year should be compared to harbor seal numbers from the previous year, during which time the oysters and seals had the greatest overlap. This was a false assumption. Becker failed to get oyster production information from DBOC. Becker's statistics were based upon this false assumption and thus they are all invalid.	X	X	X
10	**Oyster production vs. harbor seals.** Becker presentation & paper made false conclusions by only comparing oyster production vs. harbor seals for 2002-2004 vs. 2005-2007 and ignoring prior and subsequent year. The relationship is weak at best, and disappears when one compares data from 2000-2008. For 2000-2008, there is no relationship. Data were available to Becker.		X	X
11	**Oyster production vs. harbor seals**. Becker, Press, & Allen had access to harbor seal data going back to 1991 (they published numbers in May 2007), and via Allen's previous employer, Pt. Reyes Bird Observatory, to data back into the 1970's. Becker failed to compare relationship of oyster production vs. harbor seals for past 25 or more years. Data were available to Becker.		X	X
12	**Oyster production vs. harbor seals.** Becker presentation & paper made false conclusions by only comparing oyster production in all of Drakes Estero vs. harbor seals at subsites UEN, OB, and UEF. Failed to examine relationship to other subsites, to Drakes Estero population, and to combined Pt. Reyes National Seashore (PORE) populations. Data were available to Becker.		X	X
13	**Oyster production vs. harbor seals.** Becker presentation & paper made false conclusions by only comparing oyster production in Drakes Estero vs. harbor seals at subsite OB. Sandbar A had higher relationship to oyster production than subsite OB, even though there was no oyster operation at sandbar A. Harbor seal population in Drakes Estero and across Northern California declined from 2004 to 2007 similarly to subsite OB. DBOC had nothing to do with decline.		X	X
14	**Harbor seals at subsite OB.** Becker presentation & paper falsely concluded that as oyster production increased in Drakes Estero, harbor seals at subsite OB decreased. Becker failed to point out that mean number of seals at OB from 1997 to 2007 was 75 and that mean from 2005-2007 was 75. The mean did not change. 2008 mean was 97, higher than the eleven-year mean.		X	X
15	**Harbor seals at subsite OB.** Becker presentation & paper falsely concluded that as oyster production increased in Drakes Estero, harbor seals at subsite OB decreased. Failure to point out that mean number of seals at OB in 2004 was the high point of past 12 years (1997-2008). Statistical relationship was falsely driven by narrow number of years, and decline from high of 183 seals in 2004 back down to 75 seals in 2005, right back to the eleven year mean (1997-2007).		X	X

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
16	**Harbor seal disturbances.** Becker presentation & paper stated that questionable disturbance data was excluded (i.e., quality assured/quality controlled or QA/QC). In his talk, Becker said he looked at data *"disturbance event by disturbance event".* However, each of four oyster farm-related disturbances for 2006 & 2007 violated those criteria and should have been excluded.	**X**		**X**
17	**Harbor seal oyster-related disturbance event #1.** Becker presentation & paper violated QA/QC by including March 26 '06 event as a valid oyster-related disturbance. In NPS database, it is not listed as oyster-related disturbance, but rather as *"blue-yellow motorboat".* DBOC does not own such a boat. In "comments", it is listed as *"possibly oyster related".* Failed to meet QA criteria.	**X**		**X**
18	**Harbor seal oyster-related disturbance event #2.** Becker presentation & paper violated QA/QC by including the April 26 '07 event as a valid oyster-related disturbance. This is co-author Allen's Apr 26 Trip Report. Data were not entered onto the proper forms. Data were not entered into the NPS database in a timely fashion. Data is suspicious at best. According to DBOC time cards and payroll records reported to NPS in Sept 2007, the DBOC boat was not operation that day since its engine was being repaired. Moreover, the workers had clocked out and gone home when some of the observations occurred. Entry was not in August 13, 2007 QA/QC version of database, but was only entered nine months after the fact into January 16, 2008 database in violation of data management protocols. Edit log does not provide justification for this data entry. Entry into database in January 2008 was several weeks before Becker paper submitted to journal MMS.	**X**		**X**
19	**Harbor seal oyster-related disturbance event #3.** Becker presentation & paper violated QA/QC by including April 29 '07 event as a valid oyster-related disturbance. The NPS database contains a disturbance entry for April 29 that is not possible. April 29 was a Sunday. DBOC workers do not work on Sundays, and this Sunday was not an exception. This is validated by DBOC records. Moreover, analysis of tide tables suggests that seals were observed as being "flushed" at a time at which the tide was high and islands UEN and OB would have been under water.	**X**		**X**
20	**Harbor seal oyster-related disturbance event #4.** Becker presentation & paper violated QA/QC by including May 8, 2007 event as a valid oyster-related disturbance. This was date of Marin Co. Board of Supervisors hearing. Observed claimed same boat flushed seals at three different subsites at precisely the same time. The three islands are over 1 mile apart. This seems unlikely.	**X**		**X**
21	**Harbor seal disturbances.** Becker presentation & paper made false conclusion that human disturbances increased at subsite OB in 2007 vs. 2006 because they only referred to number of days of observed disturbance events. Becker failed to disclose that number of observation days during pupping season was 48 in 2007 vs. 24 in 2006. Rate of disturbances actually went down.	**X**	**X**	**X**

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
22	**Harbor seal disturbances.** Becker presentation & paper focused on human disturbances at only three of eight subsites in Drakes Estero. The most serious disturbance is a seal getting flushed into the water (FW). During pupping season from 2005 to 2007, there were 2,864 FW's recorded in NPS harbor seal database as of August 13, 2007. Park visitors accounted for 38.8% of FW's, aircraft for 25.9%, birds for 16.8%, and predators for 5.7%. The oyster farm, by stringent QA/QC criteria, accounted for none. If we accept controversial April 29, 2007 claimed disturbance, then DBOC accounted for 0.2% or 1/500th of the FW's over three year period 2005-2007. If we include controversial May 8 claimed disturbance, then DBOC accounted for 4.1% of FW's. Interestingly, 96% of recorded FW's attributed to DBOC occurred on day of Marin County hearing. Coincidence or suspicious? Becker and colleagues failed to consider all seal disturbances in Drakes Estero.		**X**	**X**
23	**Statistical model.** Becker focused on statistical correlation between oyster production in Drakes Estero and number of seals (in previous year) at subsite OB. Grey Pendleton in presentation to NRC panel made point that *"under a newly developed NOAA harbor seal monitoring protocol in Alaska, Drakes Estero would almost certainly be considered a single monitoring site".* Seals move back and forth between sites. Drakes Estero population should be considered as a whole.	**X**		**X**
24	**Becker's conclusions.** *"Analysis objectives. 1. Determine if mariculture-related human disturbance events are changing over time."* Answer: *"yes, increase".* This was an invalid conclusion. Four oyster-related human disturbances (1 in '06; 3 '07) did not meet QA/QC criteria.	**X**		**X**
25	**Becker's conclusions.** *"Analysis objectives. 2. Test competing hypotheses (natural and anthropogenic) that may be driving harbor seal counts during the peak pupping season (April 15 - May 15) at sandbars in upper Drakes Estero."* Becker concluded: *"+ENSO and -Oyster harvest explain seal counts very well at OB and UEF, and marginally at UEN."* This was an invalid conclusion. Becker tested a very narrow hypothesis. The oyster harvest correlated with sandbar A (with no oyster operation), the whole of Drakes Estero, and the whole of the northern California seal populations just as well if not better than with subsite OB.		**X**	**X**
26	**Becker's conclusions.** *"Conclusions: Counts of adults (-57%) and pups (-54%) significantly declined at OB after 2004, and at UEF after 2005."* This was a misleading conclusion. The decline at OB was between 2004 and 2005, not during the DBOC years 2005-2007.		**X**	**X**
27	**Becker's conclusions.** *"Both adult and pup counts (during peak pupping season) at OB declined after ENSO effects tapered off and oyster harvest effects kicked in."* Becker compared 2002-2004 vs. 2005-2007 for adults and pups at OB. Becker claimed cause and effect. This conclusion was invalid. Decline was from 2004-2005. If we include prior years, or 2008, relationship disappears.	**X**	**X**	**X**

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
28	**A priori hypotheses.** Becker's paper stated: *"Here we present an analysis of the seal population at three of eight subsites in Drakes Estero that were exposed to varying levels of human related disturbances associated with an oyster lease. We tested four a priori hypotheses that could explain trends in seal counts:"* The fourth hypothesis was *"the level of mariculture operations in the estuary as measured by the magnitude of annual oyster harvesting."* But there was no evidence for human-related disturbances at those three subsites. Moreover, they did not test hypothesis #4, but rather examined seals at subsite OB vs. annual oyster harvesting in the previous year, a false assumption. Thus, Becker created a false analysis based on controversial disturbance data, and then used a false assumption to test a different hypothesis than he stated.	**X**		**X**
29	**FOIA request for 2007 PRNS Annual Harbor Seal Report denied and Report hidden.** In a June 13, 2007 letter to Dr. Goodman, NPS Regional Director Jon Jarvis said the 2007 PRNS harbor seal data *"…will be prepared as a final annual report by December 2007."* On July 31, 2008, Dr. Goodman sought the 2007 PRNS Harbor Seal Report by a Freedom of Information Act (FOIA) request. On August 25, 2008, NPS Jarvis' office denied the FOIA request, stating: *"the 2007 Harbor Seal Report is undergoing peer review and is, as a result, withheld …"* However, the 2007 Harbor Seal Report (authored by Truchinski, Flynn, Press, Roberts, and Allen, two of the same authors as the Becker paper) was dated June 2008 and was already posted on the I&M web site. Dr. Goodman was unable to find that Report because the web site contains an instruction -- manually applied -- that prohibited the 2007 PRNS Harbor Seal Report from being located and retrieved by common search engines such as Google or Yahoo.	**X**	**X**	**X**
30	**Two reports; two different conclusions.** Becker's paper concluded that the harbor seals were down from 2002-2004 vs. 2005-2007 by ~55% subsite OB, and that the oyster operation and resulting disturbances were largely responsible for this decline. As described above, these conclusions were wrong and misleading. In contrast, the 2007 PRNS Harbor Seal Report makes little mention of oyster operation disturbances. The word "oyster" appears only three times in the 40 page Report. The Report (authored by two out of three authors from the Becker paper) states that at Drakes Estero,:*"…most of the disturbances were from human sources and this included hikers, anglers, swimmers, horseback riders, and recreational clammers."* They go on to write: *"In addition, activities associated with the oyster operation in Drakes Estero at times disturbed harbor seals at the upper estero subsites."* No numbers were provided; no conclusions were drawn. The Report concluded that for all of the Marin County: *"the 2007 maximum pup count fell below one standard deviation from the mean maximum pup count from 2000-2007 …"* and went on to conclude: *"The greatest number of pups was born at Drakes Estero …"* Thus, the number of pups went down along Marin County from '04 to '07, but Drakes Estero had the greatest number.		**X**	**X**

EOM#	Becker presentation to OSB, NRC, NAS and Becker et al. paper in press MMS journal	E	O	M
31	**Disturbance datasheets.** In writing about *"data quality standards",* the 2007 PRNS Harbor Seal Report stated: *"All count and disturbance datasheets completed during harbor seal surveys were entered into a relational Microsoft Access database during the course of the field season."* However, Dr. Allen's Apr 26 (2007) Trip Report was not recorded on the appropriate datasheet, and was not entered into the database during the course of the field season. Nevertheless, it was entered into the database 9 months later and formed a key data entry for Becker's paper.	**X**	**X**	**X**
32	**Rate of disturbance per hour at Drakes Estero.** The 2007 PRNS Harbor Seal Report shows that the rate of disturbance per hour at Drakes Estero was essentially unchanged from 2004-2007, while some other Marin County locations (e.g., Bolinas Lagoon, Point Bonita, Tomales Bay) had significant year-to-year differences. There is nothing remarkable about Drakes Estero in 2007. This is a different view of the 2007 Drakes Estero harbor seal population than provided in the Becker et al. paper which claimed a significant increase in oyster-related disturbances and a resulting decrease in seals.		**X**	**X**