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# Unexplained Stranding of 200 Pilot Whales and Dolphins



*"An effort was made in the large King Island stranding to return the animals to deeper water, but in some cases, the animal turned around from deeper water and went straight back to the beach."* - Scott Baker, Ph.D., OSU Marine Mammal Institute

*"It is pretty darn sad, you can hear them crying."*
- John Nievaart, King Island, Tasmania resident

EARTHFILES PODCAST

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200 pilot whales (species of dolphin) and a few bottle-nosed dolphins began mass stranding on Sunday, night, March 1, 2009, at a King Island beach above. On March 2, 2009, about 50 animals were saved by human volunteers (below) and the rest died. King Island is in the Bass Strait between northern Tasmania, an Australian state, and Melbourne, Australia.
Image courtesy Liz Wren, Tasmanian Parks and Wildlife Service.

On March 2, 2009, volunteers saved about fifty of the 200 pilot whales (dolphins) and bottle-nosed dolphins that beached on King Island north of Tasmania beginning on March 1, 2009. An unusual series of strandings has occurred since early Nov. 2008, when 60 pilot whales were stranded not far from King Island; on Nov. 29, 2008, 150 pilot whales and dolphins stranded and all died near King Island; in January 2009, 50 sperm whales stranded and all died near King Island. Scientists are puzzled by the the unexplained series of cetacean beachings. Image courtesy Liz Wren, Tasmanian Parks and Wildlife Service.

TIMESONLINE

March 2, 2009

"One of the biggest mass beachings in Australia, 200 pilot whales came ashore on King Island on Sunday evening, March 1, only 54 of which are still alive. Among the whales are a number of dolphins, according to Chris Arthur, from Tasmania's Parks and Wildlife. Around 150 local people are helping parks officials in trying to refloat the whales from a Naracoopa beach and shepherd them back to sea, where a large number of whales were still milling in a pod."

**March 6, 2009 Newport, Oregon -** Scientists who study whales and dolphins are puzzled about repeated strandings of large numbers of pilot whales – which are actually large dolphins – and other dolphins and sperm whales on or around King Island north of the Australian state, Tasmania. There was also highly strange – perhaps unprecedented behavior – in Manila Bay, Philippines, last month on February 10, 2009, when 500 melon-headed dolphins filled Manila Bay and swam back and forth as if completely disoriented.

Whales, dolphins and porpoises are also known as cetaceans. All cetaceans are mammals that once lived on land some 50 to 60 million years ago. In fact, their closest living genetic relatives are hippopotamuses.

Hippopotamus (*Hippopotamus amphibius*).

Stranded, dead long fin pilot whale whose ancestor was the hippopotamus about fifty million years ago before cetaceans moved from land into the world's oceans and rivers.

Something made cetacean ancestors leave land for the seas -- and now whales, dolphins and porpoises live in the oceans, rivers and seas. But because they are mammals, they still must breath oxygen into their lungs. That's what the blow holes are for on top of their heads. As deep as some whales dive, within an hour or two, the big creatures must swim back to the surface to breathe. Like mammals, cetaceans also give birth to live young – but underwater.

Whales use a form of sonar called echolocation to locate and identify objects around them. It's also thought that whales use the Earth's magnetic fields to help navigate.

> [ Editor's Note: *Wikipedia* - "Echolocation, also called biosonar, is the biological sonar used by several animals such as dolphins, shrews, most bats, and most whales. Echolocating animals emit calls out to the environment and listen to the echoes of those calls that return from various objects in the environment. They use these echoes to locate, range, and identify the objects. Echolocation is used for navigation and for foraging (or hunting) in various environments.
>
> "Echolocation works like active sonar, using sounds made by an animal. Ranging is done by measuring the time delay between the animal's own sound emission and any echoes that return from the environment. Echolocating animals have two ears positioned slightly apart. The echoes returning to the two ears arrive at different times and at different loudness levels, depending on the position of the object generating the echoes. The time and loudness differences are used by the animals to perceive direction. With echolocation the bat or other animal can see not only where it is going, but can also see how big another animal is, what kind of animal it is, and other features as well." ]

Whales and dolphins generally live between 40 and 90 years and species such as sperm whales grow up in close family pods that travel and hunt together all their lives.

Unlike those tight whale and dolphin families, porpoises are more individual and less group-dependent. That difference might be one of the reasons why whales and dolphins strand themselves on beaches, while usually porpoises do not. One unanswered scientific question is: Do healthy whales and dolphins follow a family matriarch leader on to beaches for unknown reasons – even when beaching can mean death for some, or all, of the family pod?

Another proven cause of cetacean beachings is military sonar. Mark Simmonds of the Whale and Dolphin Conservation Society and an expert on cetacean strandings said about the King Island beachings that two species coming ashore together - pilot whales and bottle-nosed dolphins - aroused his suspicion that military sonar might have been involved. "To get more than one species is unusual. When you do, you get more suspicious because it means that the two species might have been driven by something. It does make us worried. We are certainly going to call for a very thorough investigation."

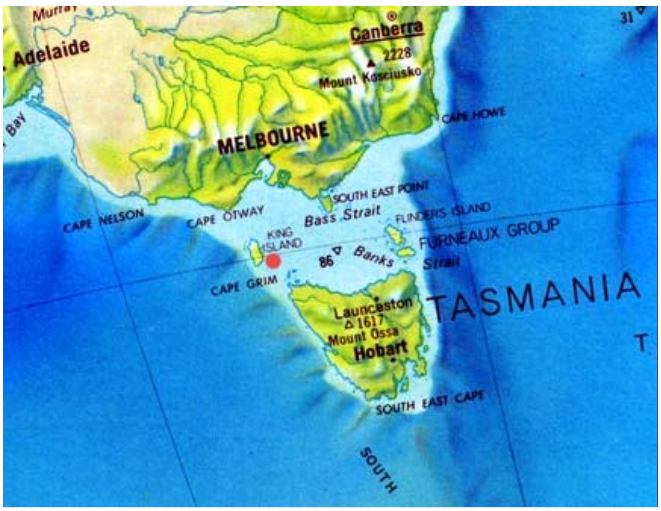
This week I talked with a whale expert about that most recent March 2, 2009, mysterious dolphin strandings on King Island and the previous three dolphin and sperm whale strandings around King Island north of Tasmania. He is Scott Baker, Ph.D., Associate Director of the Marine Mammal Institute at Oregon State University and Adjunct Professor of Molecular Ecology and Evolution at the University of Auckland in New Zealand. Dr. Baker received his Ph.D. in zoology with a study of humpback whales in southeast Alaska and Hawaii. He is also puzzled about the recent, repeated strandings.

## Interview:

Scott Baker, Ph.D., holding skull of a new beaked whale species he discovered with DNA at Oregon State University's Marine Mammal Institute, Newport, Oregon.

**C. Scott Baker, Ph.D., Adjunct Professor, Molecular Ecology and Evolution, University of Auckland, New Zealand, and Associate Director, Marine Mammal Institute, Oregon State University, Newport, Oregon:** "Tasmania has had a series of strandings over the last few months, beginning in November 2008, about four months ago. They had 60 pilot whales strand on Anthony Beach, which is on the western edge of northern Tasmania – not far from King Island.

Then on November 29, 2008, another 150 stranded again in a similar area. Unfortunately, in that second very large stranding, all the animals died. In January 2009, there was a stranding of about 50 sperm whales – again, in a very similar area – and they all died. It's very difficult to attempt rescue on such large animals. And then most recently on March 2, 2009, a group of nearly 200 pilot whales and a small number of bottle-nosed dolphins stranded again on a nearby area of King Island, which is in Bass Strait near the northern coast of Tasmania.




King Island (red circle) is in the Bass Strait between northern Tasmania, an Australian state, and Melbourne, Australia.

And the local residents were able to rescue about 40 pilot whales and a half dozen bottle-nosed dolphins. This is a little unusual having four strandings, mostly involving such a large number of animals.

WHAT IS YOUR PROFESSIONAL GUESS, GIVEN YOUR LONG CAREER WITH CETACEANS, ABOUT WHAT IS GOING ON?

Well, I think it's fair to admit that we have no agreed scientific explanation for these kinds of mass strandings. But it is important to realize that first, these are highly social animals. That's what characterizes these mass strandings from other sorts of strandings of single individuals. So, these kinds of mass strandings do not occur with baleen whales such as humpback whales or grey whales or blues or fin whales. Those animals might strand, but only as individuals.

The mass strandings in large numbers are only the highly social species, like Long-finned pilot whales [ technically a species of dolphins, not whales] and sperm whales. It's also thought that these animals associate around matriarchs, that they have what is called a 'matrilineal society.' So in some cases, male and female offspring of a mother might remain with the pod all their lives. That give us social cohesion or social bond that is thought to be very important in probably initiating the stranding events.

> [ Editor's Note: *Wikipedia* – "A matrilineal is a line of descent from a female ancestor to a descendant (of either sex) in which the individuals in all intervening generations are female. In a matrilineal descent system (sometimes popularly called uterine descent), an individual is considered to belong to the same descent group as her or his mother. This is in contrast to the more common modern pattern of patrilineal descent. The uterine ancestry of an individual is a person's pure female ancestry, i.e. a matriline leading from a female ancestor to that individual.]

But what *causes* the strandings? That's has really not been possible to determine so far, but there are a number of reasonable theories. One that I think has been generally accepted for the last few decades is that the whales move into these shallow areas, like a shallow, sloping sandy beach, and their sonar becomes confused because the sonar bounces off the shallow slope and does not return to them, so the animals think they are in deep water, when in fact, they are moving into shallow areas and then they become trapped.

BUT WHALES LEFT LAND ABOUT 60 MILLION YEARS AGO, IF I UNDERSTAND THE LITERATURE CORRECTLY?

That's correct, yes, about 60 million years ago.

OK, AND YOU WOULD THINK THAT IN 60 MILLION YEARS THAT THIS LARGE ANIMAL EVOLVING IN THE OCEANS WOULD NOT BE VULNERABLE TO SOMETHING LIKE ECHOLOCATION BEING FOULED UP BY APPROACHING CLOSE TO SHORE.

Well, all animals – just like humans – make mistakes. (laughs) You know, we're seeing an economic mass stranding occurring here in the U. S. Social animals – part of the cost of sociality is group thinking and that leads to stampedes and it leads to stock market crashes. I think that is a component of this stranding phenomenon.

These are very sophisticated animals with very sophisticated sonar, but anyone can make a mistake.

FOUR MASS STRANDINGS IN FOUR MONTHS SUGGESTS THAT SOMETHING MIGHT BE GOING ON. I'M CURIOUS IF YOU HAVE SEEN LAB RESULTS FROM NECROPSIES ON THE KING ISLAND STRANDED ANIMALS YET?

No, I don't think there has been time for that. And typically, necropsies have not shown anything. I'm not aware of any mass stranding in Australia or New Zealand – and there have been many of them – where necropsy results suggested that there was widespread illness among the individuals. Most of them appear to be healthy. Now, that's not to say that one of the individuals is not sick and that might be a key individual (matriarchal leader), but it has been very difficult to determine that. There were nearly 200 individuals in this most recent mass stranding in which 150 died. It would be impossible be to do detailed necropsies on all of them. So, if one of them was the key matriarch and that individual was sick, unfortunately we only have a fairly low probability of detecting that.

## Military Sonar Linked to Some Cetacean Strandings

I HAVE AN ARTICLE IN FRONT OF ME FROM *WIKIPEDIA* ABOUT THE HISTORY OF BEACHED CETACEANS THAT BEGINS THIS WAY:

> 'Another means by which Naval sonar could be hurting whales is a form of decompression sickness. This was first raised by pathological examination after fourteen beaked whales stranded in the Canary Islands. The stranding happened on September 24, 2002, close to the operating area of Neo Tapon (an international naval exercise) for about four hours after the activation of mid-frequency sonar. The team of scientists found acute tissue damage from gas-bubble lesions, which are indicative of decompressions sickness. The precise mechanism of how sonar causes bubble formation is not fully known. It could be due to whales panicking and surfacing too rapidly in an attempt to escape the sonar pulses."

[ Editor's Note: *Wikipedia* - "There is evidence that very loud noise from anti-submarine warfare sonar may hurt whales and lead to their beaching. On numerous occasions whales have been stranded shortly after military sonar was active in the area, suggesting a link. Reasons as to how sonar may cause whale deaths have also been put forward by scientists after necropsies found internal injuries in stranded whales. In contrast, whales stranded due to seemingly natural causes are usually healthy prior to beaching.

It has been argued that the very loud rapid pressure changes made by sonar can cause hemorrhaging. Evidence emerged after the beachings of seventeen whales and a dolphin in the Bahamas in March 2000 following a United States Navy sonar exercise. The Navy accepted blame in this Joint Interim Report which found the dead whales to have experienced acoustically-induced hemorrhages around the ears. The resulting disorientation probably led to the stranding." ]

COULD THERE BE SOME SECRET MILITARY OPERATION GOING ON AROUND KING ISLAND NORTH OF TASMANIA AND THE ONLY WAY TO CONFIRM THAT WOULD BE NECROPSIES ON ALL THE AVAILABLE DEAD BODIES?

Well, the decompression hypothesis is pretty well established now in cases where it appears the effects are response to the Navy mid-range sonar. You're right, that description is quite accurate. The sound is apparently stampeding the animals into a shallow area and then the animals are pushed up into shallow depths where they have not had time to decompress.

Now, this came as a bit of a surprise to a lot of biologists involved in the study of marine animals because we had long assumed that cetaceans – whales and dolphins – had some form of natural protection against the 'bends.'

[ Editor's Note: *Wikipedia* – "Bends, decompression sickness, the diver's disease, caisson disease, are all names given to a variety of symptoms suffered by a person exposed to a decrease (nearly always after a big increase) in the pressure around the body. The body must adapt to the pressure following a rapid ascent. It is a type of diving hazard and dysbarism. The surfacing diver must enter a recompression chamber to avoid the bends. Decompression sickness is caused by excess inert gases such as nitrogen, which have dissolved in body liquids and tissues while the gas was being inhaled at higher pressure."

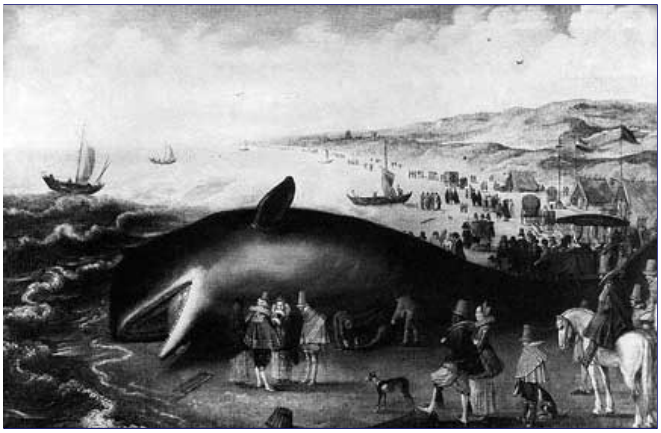
The excess inert gases come out of physical solution as the pressure reduces and form gas bubbles within the human body - or cetaceans exposed to military sonar, probably because the animals try to rush upward away from the sonar too quickly.]

But it turns out that might not have been entirely correct, that if they are deep diving animals such as pilot and sperm whales and beak whales, if they are suddenly driven up to shallow water where they can't perform a series of semi-decompression dives to moderate depths, then they could suffer the bends.

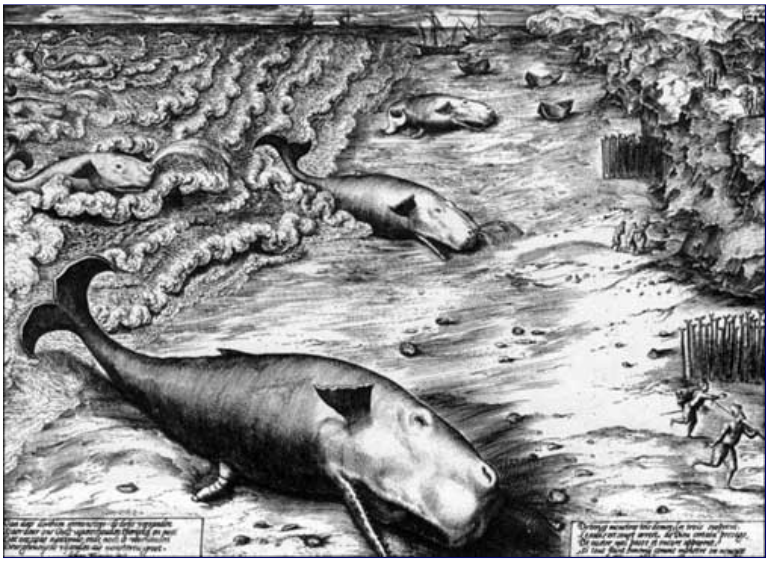
Now, I would also admit that if it is a military operation, whether we can obtain that information, I can't be absolutely sure of that. But I can be quite sure that there will be an attempt to obtain that information. Certainly, military operations are a potential and there have been places where there have been quite a direct correlation - almost certainly a causal mechanism involved in strandings. But mass strandings of pilot whales have been going on since the time of Aristotle. He commented on them in the Mediterranean twenty-five hundred years ago. He had no explanation for them either.

[ Editor's Note: *Wikipedia* - Historic reports of whale and dolphin strandings:

A mass stranding of pilot whales (Long-finned dolphins) on the shore of Cape Cod, Massachusetts, on June 30, 1902.



Artist's sketch of whale stranded at Katwijk, Holland, beach in 1598.
Source: *Monsters of the Sea* © 1994 by R. Ellis.



"Three Beached Whales," a 1577 engraving by Dutch artist Jan Wierix, which depicts stranded sperm whales. Source: *Monsters of the Sea* © 1994 by R. Ellis.

## Westerly Wind Cycles - Do They Change Cetacean Food Supply Routes?

There is an alternative hypothesis in this case and it has been proposed by some Australian scientists based on the pattern of mass strandings over the last few decades. There is a decadal cycle of westerly winds that shift the areas of productivity in that part of the world.

DO YOU MEAN BY PRODUCTIVITY THAT THE FOOD THAT THE WHALES LIVE OFF OF WOULD BE GOING IN DIFFERENT PARTS OF THE OCEAN?

Exactly. The food supply might be shifted more toward the shore, or into an area of fairly shallow, sandy banks. The pilot and sperm whales in pursuing their prey into somewhat

unfamiliar territories and shallow waters are getting confused, disoriented and stranding themselves.

## After Long Evolution in Oceans, Why Are Whales and Dolphins Still Vulnerable to Strandings?

WHALES AND DOLPHINS ARE SUPPOSED TO BE HIGHLY INTELLIGENT, CORRECT?

Most whales and dolphins have a very high degree of cognitive ability that we would consider to be intelligence, something comparable to our own problem-solving abilities, yes.

DOESN'T THAT MAKE STRANDINGS EVEN MORE MYSTERIOUS, ESPECIALLY AT THE NUMBER OF 200, REGARDLESS OF SOCIAL GROUPINGS? THEY ARE SUCH INTELLIGENT CREATURES THAT HAVE BEEN LIVING AND EVOLVING IN THE OCEANS OF THIS PLANET FOR NEARLY 60 MILLION YEARS. THAT MAKES IT SEEM SO DIFFICULT TO UNDERSTAND WHY THEY WOULD NOT ALREADY KNOW HOW TO AVOID THESE SITUATIONS THAT PUT THEM INTO BEACHES.

I agree. I think it's one of the great mysteries of sociality in this case because I think it is somehow tied to the fact that these species – long-finned pilot and sperm whales primarily, are highly social species.

## Magnetic Field Anomalies - Any Link to Cetacean Strandings?

WHAT IS YOUR OWN OPINION ABOUT THE POSSIBILITY THAT MAGNETIC FIELD ANOMALIES SUCH AS AN UNDERWATER VOLCANO ERUPTING, IT COULD BE A SEISMIC EVENT, IT COULD BE THAT THERE REALLY IS SOME POLE SHIFTING TO SOUTH AFRICA, AND THEN SOLAR FLARES THAT CAN INTERACT WITH MAGNETIC FIELDS AND CAUSE ANOMALIES? WHAT IS YOUR OWN PERSONAL FEELING ABOUT MAGNETIC FIELD ANOMALIES AFFECTING THE CETACEANS AND CAUSING BEACHINGS OR STRANDINGS?

Well, I think it's unlikely to be the causal explanation for the beachings. It may, though, have some association with where the strandings occur because they do seem to occur in specific areas over time repeatedly. It might be that the stranding areas are on the magnetic paths that the animals are using for navigation. We don't really know the extent to which they rely on magnetic cues, but it's certainly possible that there are some magnetic cues that they use. If so, the cetaceans might be following magnetic paths and if beaches are on or near those paths, then they are simply in the way of the movement of the animals. In that case, magnetic field anomalies are not a causal mechanism; it's a happenstance.

## Do Cetaceans Willingly Beach To Stay With Their Family Pod?

BUT AGAIN, IT SEEMS THAT THESE VERY INTELLIGENT LARGE, EVOLVED ANIMALS SHOULD NOT SUCCUMB TO CONFUSION WITH THEIR ECHOLOCATION AND MAGNETIC FIELDS.

That is one of the puzzling aspects of the strandings. The animals often seem to be intentionally stranding and this is something that some of the hypotheses do not explain. This was true in some of the recent events in Tasmania. An effort was made in the large King Island stranding to return the animals to deeper water, but in some cases, the animal turned around from deeper water and went straight back to the beach.

That's most easily explained by the social phenomenon, the group panic or group distress. The individuals that are taken back out to deep water might want to be in deep water. They might recognize they have been taken out to deep water, but they hear the distressed calls of their kin on the beach and they simply go back.

We might say that's not a very adaptive mechanism, but it's part of the cost of sociality, just like disease is a cost of sociality. We live in large groups and so we're susceptible to epidemics. You might ask: Why live in a large group? We should all be living in little huts

ten or fifteen miles away from each other. But there are benefits to living close together and there are benefits to sociality for the cetaceans. These are very successful species! They have populations worldwide in hundreds of thousands of individuals. But they are susceptible to these tragic mistakes.

THE CETACEANS ARE SUCH WONDERFUL CREATURES AND AS ONE OF THE PEOPLE SAID ON THE RECENT KING ISLAND STRANDING IN TASMANIA, 'IT BROKE MY HEART TO HEAR THEM CRYING.'

I agree with that. To hear them on the beach dying, surrounded by their friends and their family, is quite tragic.

AND HARD TO UNDERSTAND IF THEY ARE HEALTHY.

Well, certainly some or most of them are healthy and that, I think, is what makes it all the more puzzling. But there might be individuals within the group that are truly in distress of some kind.

## Genetic Relationships of Stranded Cetaceans?

HOW DO YOU GO FORWARD FROM HERE AS A CETACEAN EXPERT WITH OTHERS IN STUDYING THESE STRANDINGS, BEACHINGS, OF SO MANY ANIMALS IF THEY PERSIST?

We need to know about them in the wild, so one of our interests has been taking methods to study the genetic relationships, the kinship of these individuals on the beach, and apply that to living populations in the wild – those are animals that are not in distress. Some of what we found with stranded pods was a little unexpected. We found that they were not all close relatives to each other. They were not all part of the same matrilineal line. They appeared to be mixes of different groups. We need to know if that is the case in the wild.

We can also begin to understand better their movement patterns with methods such as satellite tagging. I did notice that the Australian scientists were able to put a small number of satellite tags on some of the animals that stranded in November 2008. I happened to be with a colleague, Nick Gayles, from the Australian Marine Mammal Center and he reported that the tags had been quite successful and that the animals that had been saved and released back into the deeper water, some of them seemed to behave quite normally and moved back out into deep water and seemed to be swimming together again.

DR. BAKER, DID YOU ASK HIM WHY HE THOUGHT THE ANIMALS STRANDED IN THE FIRST PLACE?

Nick and I have had long conversations about this. (laughs) All marine scientists have these conversations over a couple of beers every evening and we would cover pretty much the exact range that you and I have covered today. But we don't have a single explanation. There might not be a single explanation. Each stranding might be a little bit different.

## Undetected Environmental Factor X?

IF YOU HAVE FOUND A MIXTURE OF ANIMALS THAT ARE NOT RELATIVES IN A POD, DOESN'T THAT INCREASE THE POSSIBILITY THAT THERE IS SOMETHING IN THE ENVIRONMENT THAT PERIODICALLY CHANGES ENOUGH TO DISORIENT THE CETACEANS AND CAUSE THESE HUGE STRANDINGS?

It does shift a little bit the likelihood of some of the explanations, but without the knowledge of what their natural social groupings are, I don't think we can yet interpret that too much. If we go out and find these large pods are typically made up of a mix of different family groups - it's unlikely they would be close relatives to that many individuals. It's possible there are smaller family groups that associate together just as we do in communities and those communities have almost as much cohesion as the blood kin.

BUT THERE IS STILL THE POSSIBILITY IN THE KING ISLAND HUGE STRANDING OF THE PILOT WHALES AND A FEW DOLPHINS - AND THE THREE PREVIOUS STRANDINGS IN TASMANIA GOING BACK TO NOVEMBER 2008 - THAT THERE MIGHT BE SOMETHING GOING ON IN THE ENVIRONMENT THAT NO HUMAN YET UNDERSTANDS THAT'S CAUSING THESE MASSIVE, REPEATED STRANDINGS?

Causing or influencing? If this hypothesis about 10-year wind shifts that cause changes in prey patterns are correct, then it might be the cetaceans are pursuing prey into areas that

they are just not familiar with. That would be a consistent explanation for the fact there have been four strandings near Tasmania by both pilot and sperm whales, given that the two species feed on similar prey, particularly deep water squid. So, if the wind patterns have driven deep water squid up into more shallow water, then the animals are in unfamiliar territory.

SO A LARGER CONTEXT OF POSSIBLE CAUSE FOR ALL THE RECENT LARGE STRANDINGS OFF TASMANIA AND THE MELON-HEADED DOLPHINS IN MANILA BAY MIGHT BE RELATED TO GLOBAL WARMING BECAUSE TEMPERATURES ARE CHANGING AND WATER TEMPERATURES ARE CHANGING. THAT MEANS SPECIES IN THE FOOD CHAIN THAT HAVE BEEN IN VARIOUS PARTS OF THE OCEANS COULD BE MIGRATING AWAY FROM CERTAIN TEMPERATURES AND THIS MIGHT BE AFFECTING THE CETACEANS' NORMAL FOOD GATHERING?

Well, that's possible. I don't know that it explains King Island and Manila Bay. The waters around Australia and Tasmania certainly are warming. Whether that is good or bad for the pilot whales is harder to tell. Around New Zealand, where the pilot whales strand along quite a gradient of latitude from near-tropical beaches on the north of the island down to sub-Antarctic beaches in the south. We have not seen a strong trend or change that appears related to global temperature increase. But I think that is something that we might see in the future. Global temperature changes might influence where it happens, but not *why* it happens."

Dr. Baker is going to help me contact the Tasmanian Department of Primary Industries and Parks to request copies of whatever necropsy reports will be made available from the King Island March 2nd stranding of nearly 200 pilot whales. Whatever I learn, I will report in a future Earthfiles.

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### More Information:

For further reports about marine animal problems, please see **Earthfiles Archive:**

- 06/21/2008 — Updated June 25, 2008: Increasingly Acidic Pacific Coast Waters Threaten Marine Life
- 02/05/2008 — Federal Court Rejects Bush Navy Sonar Exemption
- 05/18/2007 — Antarctica: Unprecedented Western Ice Melt and CO2-Saturated Southern Ocean
- 04/08/2006 — Recent Caribbean Coral Reef Die-Off Biggest Ever Seen
- 02/20/2006 — Mysterious Deaths of Whales in Mexico
- 04/01/2005 — What's Killing Off Marine Life Every 62 Million Years?
- 05/17/2003 — Major Study Reports Only 10% of Large Ocean Fish Remain
- 07/20/2002 — Extinctions of Earth Life Are Accelerating Rapidly
- 06/30/2002 — The "Bloop" Sound in the Ocean
- 02/07/2001 — 94% Decline In Aleutian Islands Sea Otter Population
- 06/08/1999 — Increased Gray Whale Deaths in Spring 1999
- 05/04/1999 — Mysterious Deaths of Harbor Porpoises on East Coast

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### Websites:

OSU Marine Mammal Institute: **http://mmi.oregonstate.edu/**

Beached Whales: **http://en.wikipedia.org/wiki/Beached_whale**

Pilot Whales: **http://en.wikipedia.org/wiki/Pilot_Whales**

500 Stranded Melon-Heaaded Whales, Manilla Bay, Philippines, February 2009: **http://en.wikinews.org/wiki/500_stranded_melon-headed_whales_rescued_in_Philippine_bay**

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