

BOAT BASIN BULLETIN

Issue 9

All the news that floats we'll print

December 2009

ICE

Ed Bacon
S/Y Prelude

This is the first issue of BULL dedicated to one topic: ICE – Past, Present and Pfuture.

To most Manhattanites, ICE means the In Case of Emergency contact on their cell phones. To the Basinites, ICE means It Causes Emergencies. Many feel that a nor'easter, a hurricane or the lack of dredging poses the biggest danger to the Basin. But what causes more angst every year? What has repeatedly caused destruction at the Basin? What has cost Parks most in repairs? What has cost Parks the most in good will? Isn't it protection from the Hudson River ice?

Our economy has just experienced a Black Swan (see [Black swan theory](#)) financial meltdown. If we have a Black Swan ice flow, we may have Basin infrastructure damage that won't be repaired until long after the ice's meltdown.

Thanks to Dick DeBartolo, Jim Marsten,, Leslie Day, Frances Gaffney and Raquel Buhner for the pictures in this issue.

The next issue will be in the standard BULL format. Anyone else with Basin pictures? Articles? News? E-mail them to ebacon@nyc.rr.com and I'll publish them in a future issue. If no contributions are received, BULL will be issued infrequently.

-ED-

IN THIS ISSUE ...

Past

- W. 79th St Boat
Basin Ice
Protection History

-

Present

- Current Boat
Basin Ice
Protection
- Normal Winter
- Black Swan
Winter
- Ice Forecast

Pfuture

- Pfantasy pfuture:
Ice Protection
- Cri de Coeur
- Parting proverb

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PASTBoat Basin History: Ice

Before the Boat Basin was built, the North River (Hudson River) ice conditions were oft times formidable as reported in this March 14, 1888 New York Times article:

The last week of January, 1821, brought an exceptionally cold snap, with the thermometer ranging several degrees below zero. A stiff wind which prevailed succeeded in packing both the East and North Rivers, the Kill von Kull, the Narrows between Staten Island and the Long Island shore, and the Upper Bay between Staten Island and this city with a solid mass of ice. Singularly enough, the main ferries between this city and Brooklyn were closed only a few hours, but many hundreds crossed on the ice bridge between the two cities. Between the foot of Cortlandt-street, on the North River, and Paulus Hook in Hoboken, loaded sleighs crossed the river on the ice, and the ice was for some time the only means of getting from New-Jersey to this city. At the same time sleighs crossed the Kill von Kull and hundreds of adventurous persons crossed from Staten Island to a point near Fort Hamilton. Still others managed to cross from the Battery to Governor's or Bedlow's Island and thence down to Staten Island. The pack which permitted this unusual travel lasted two days. During its continuance some adventurous person built a temporary tavern on the ice on the North River, midway between New-York and Hoboken, and there dispensed eatables and drinkables to travelers between the two States. At least that is the statement of the papers of that date.

While the Tappan Zee Bridge piers, the Coast Guard icebreaking vessels and global warming preclude the river freezing from bank to bank near the Basin, ice has been, is and will be the major danger to the Boat Basin.

Original ice protection



- from *The Power Broker* by Robert Caro

When the City built the Boat Basin in the 30's, they designed it well by angling A Dock and C Dock to divert the ice. Ice breakers were then installed north of A to relieve the force of the ebb flow of ice from upriver and grounded derelict barges were set at an angle south of the Basin to relieve the force of the flood flow of ice.

C Dock head extension

When the head of C Dock was extended (red arrow), it was extended to the southwest rather than parallel to the C Dock head, the shoreline or to the ice flow, presumably to maximize the number of slips on the south side of C dock. The southern end of the extension was located outboard of the last ice breaker. Strong ebb ice flows have smashed the facing planks at the southern end of the extension several times and the extension had to be strengthened a few years ago.



D and E floating docks added

The floating D and E Docks were added to the Basin. The gaps between E and D and between D and the C Dock extension were plugged during the winters with floating docks and the A-C opening was plugged with high freeboard camels.



The strong ice flows of the early to mid 70's demonstrated that Mother Nature liked to play dominoes:



- *by Dick DeBartolo from Jim Marsten*

Bubbler system

An ice, albeit local or internal ice, protection improvement was reported by the New York Times in November 11, 1962.

The bubbler system was installed by the concessionaire for the 1962-63 winter to entice more year round boats. A compressor on the foot of A Dock and another on the foot of C Dock pumped air through perforated pipes and hoses on the bottom and kept the liveaboard areas, then from the north side of D to the south side of A, free from freezing. In 1972, the bubble system was abandoned due to frequent breakdowns and to the pipes and hoses being chopped up by vessel propellers during the summer.

Since then, the Basin does freeze over during a long cold streak and one can occasionally walk between the docks on the ice. There has been no damage to hulls or infrastructure from the internal ice.



In 1978, residents skated between D and C Docks.

Paul Jordan, who was ice dancing at Wohlman Rink well into his 70's, showed his form to a skating party crasher, Paul's girlfriend Barbara and Jack Ryan's daughter Michelle.

Skating was called off when the ice began to roll in waves as one skated across the ice. It was decided not to emulate the deadpan comedian Steven Wright who has stated, "I like to skate on the other side of the ice."

Floating docks T's



In the early 1970's, T's were built on the ends of D and E Docks with camels plugging the openings but in 1977 and 1978 the T's and dolphins were partially destroyed by strong ice flows. There is nothing like the sound of wood being smashed and splintered by ice at three in the morning to get your attention. Notice the dolphin south of the C Dock extension – it anchored the northern end of the D Dock T. The boat on the right, my "Grok", was saved by the community moving it from the first slip to the third slip on the south side of D Dock.

Wave wall



The wave wall was built in the late 70's to protect D and E from the ebb flow of ice. Camels plugged the southern entrance between the E Dock T and the wave wall and the northern entrance between the heads of A and C.

Once the wave wall was completed, the marina had reached a safe configuration of ice protection. The wagons had been circled. No longer was there a first line of defense of floating docks. During the 80's, the Basin's ice protection was excellent. The south side of E Dock was filled with boats during the winters.

Then the deterioration began

Ice breakers



When the A Dock ice breakers were replaced in the 70's, the replacement ice breakers were installed with peeler rails near the MLLW (Mean Lower Low Water) mark, the lowest level in most tide tables. The maximum ebb flow of current and ice occurs near low tide at the Basin since the ebb current begins over 3 hours before low tide and the maximum flow is halfway through the tide cycle.. If a winter spring tide and a strong W to N wind combine, the ice is pushed to the NY side of the Hudson, a wind - assisted extreme low water (NOAA calls it the Lowest Observed), occurs and a very strong ebb current runs downriver. The strong ebb flow of ice floes hits the ice breakers below the peelers (see the daylight on the right side of the photo) at maximum velocity.

At Lowest Observed, the ice is stopped by the mud (mud line runs from the second slip near the head of A Dock upriver to the point where the highway is closest to the river), sparing the inboard ice breakers. Thus, the two outboard deep water ice breakers bear the brunt of the diverted ebb ice flow at its maximum velocity.



In February, 2004, the two outboard icebreakers that divert ice from the head of A Dock and the C Dock extension were bowled over by medium-sized ice floes on a medium-flow current day. The ice had hit the breakers below the peeler rails, lifted the icebreakers and snapped off the icebreakers' wood pilings. Before the ice breakers were replaced, many facing planks on the head of A Dock and on the north side of A dock were swept away and the just-repaired facing planks on the C Dock extension were crushed again. Parks repaired the extension again and strengthened the local whalers and internal structure.



The two outer icebreakers were replaced with steel piling clusters but are still unfinished. There are no peeler rails to divert the ebb flow of ice. Horizontal steel collars were welded around the pilings cluster of each ice breaker above the mean low low water mark. Also, the gap between the first and second icebreaker is the only gap without a dolphin. If a heavy ice flow occurs, the two outboard ice breakers may be lifted out again when the ice piles up under the I-beam collars.

A Dock gaps

Until January, 2008, there was nothing to stop the ebb flow of ice, the stronger flow, from pouring into the Basin through the massive gaps in A Dock planking. Kayakers paddle through some of these gaps. The floating docks that were installed on the north side of A Dock to prevent floes from entering the Basin can be seen in the first photo.





The pictures above show the daylight visible through the gaps of the A Dock head.

Wave wall



The photo which was taken at a normal low tide shows that the facing planks have been sheared off at the lower whaler or cross beam level. Floes can enter the Basin under the whaler and through the missing facing planks. The loose facing planks, many of which were either lag screwed or through bolted at two of the three whalers, could be torn off the wall and worst case, neighboring facing planks could be torn off creating larger gaps.



Wave wall from inside the Basin

Grounded barges south of Basin



Flood current ice flow damage was not a factor for decades. During the 80's and early 90's, the slips on the south side of E dock were occupied during the winters.

Two barges between the three dolphins shown in the photo were set at an angle south of the Basin to divert the flood flow of ice away from E Dock toward the river. The grounded barges deteriorated over the years and the remaining barge hull with a few ribs is exposed only at lower tide levels..



The peak flood current and ice velocity is near high tide at the Basin and at that time the remaining barge is underwater (as seen in this photo) and can't divert the flow of ice.

Once the barges were no longer effective, the E Dock and the E Dock T – wave wall ice barrier had to bear the brunt of the flood ice flow. Floating docks were once again the front line of defense.

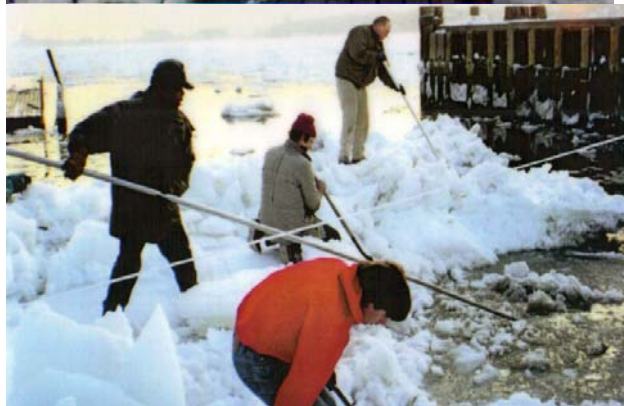
It was only a matter of time....

In 1995, the ice pushed in the southern entrance E Dock T - wave wall ice barriers:



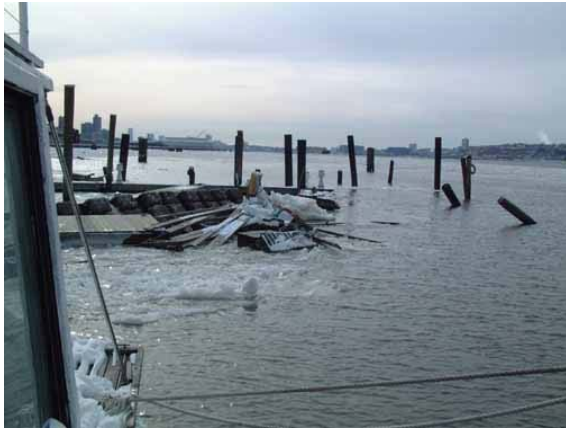
Photo above: Head of E Dock after ice barrier pushed in. Delta Willis' "Delta Queen" bow to the right.

Photo to the left: Delta Willis' "Delta Queen" pushed to the east over its inboard piling. The ice barrier is off her stern.



Above four photos are clockwise: 1) Werner Buhner on the stern of "Raquelita" with the floating dock ice barrier bridged to the "Delta Queen", 2) Head of D Dock and bow of "Raquelita" which was pushed onto D dock, 3) Werner, Daron Katzman, Troy (look how thin!), and ?? tearing down the bergs before Parks started charging the bergs dockage and 4) end of floating dock ice barrier and piling, which was between "Raquelita" and Dick DeBartolo's Burns Craft, off "Raquelita's" stern .

In February, 2004, E Dock was overwhelmed by the ice and pushed almost to D, punching a hole in Dick DeBartolo's boat (on the south side of D). Bob Kilo's quick repair averted a sinking.



Four photos above clockwise: 1) E Dock T crushed, 2) Looking south from D Dock: Troy (always there for an emergency), Greg Smith and Dave??, 3) remnants of E dock, and 4) looking south from D Dock, the tug that Greg Smith and Chris Williamson brought in as a floating boat ice barrier to prevent further damage.

Below is the New York Times article:

Breaking the Ice Can Be a River Hazard

By COREY KILGANNON
Published: February 7, 2004

The recent thaw may have relieved New York streets of much ice and snow, but it has created havoc along the city's waterways. As warmer weather melts the thick ice, chunks break loose and, swept by currents and wind, slam into shore. The ice floes have splintered bulkheads, destroyed hefty pilings, uprooted docks and dislodged buoys.

On the Hudson River, thick floes, loosened from heavy ice packs many miles upriver, have drifted down with the current. On Tuesday, some of them destroyed two heavy-duty stanchions, called icebreakers, built to protect the 79th Street Boat Basin on the Upper West Side of Manhattan. A sturdy protective cluster of seven pilings, known as a dolphin, was also knocked down, leaving docks and possibly the boats behind them vulnerable.

"The marinas across the city are taking a severe hit," the city's parks commissioner, Adrian Benepe, said yesterday. "There's so much ice this year that you have ice slabs almost a foot thick coming down the river. We've become a victim of time and tides."

Mr. Benepe said he asked the Coast Guard yesterday to protect the marina from more ice floes by stationing a vessel where the icebreakers had been. "We hope it doesn't warm up too quickly, because more ice could break off and really damage the marina."

In upper Manhattan near the Cloisters, the Dyckman Marina sustained about \$70,000 worth of damage, said Jerry O'Rourke, who operates the marina. Mr. O'Rourke and his dockmaster, Capt. Michael T. Byarard, gazed yesterday at the damage: seven uprooted pilings, several damaged docks and 15 heavy mooring anchors dragged down the river to oblivion.

"We have no icebreakers, so we get hit by everything that floats this way," Mr. O'Rourke said.

Petty Officer Mike Lutz, a spokesman for the Coast Guard, said yesterday that many buoys marking channels in the Hudson and in New York Harbor had been pulled off course, along with their mooring anchors.

At the Hudson River Yacht Club, an 80-boat marina in the Mill Basin section of Brooklyn, heavy ice this week dislodged about 20 large pilings, damaged several docks and apparently sank one member's boat, a 33-foot Silverton, said Steve Visco, the club's commodore.

"We've had a tremendous amount of damage, at least \$50,000 worth, easy," he said. "I'm here 38 years and, except for the winter of '75-'76, I've never seen this kind of damage. It happens when it thaws, because the heavy slabs of ice around the shoreline are pulled out with the outgoing tide, and they snap the dock supports like pretzels and this is thick galvanized metal pipe."

Each icebreaker at the 79th Street Boat Basin consists of a dozen or so pilings braced together by I-beams and railroad ties. The pilings, similar to telephone poles, can run 70 feet long and are driven 40 feet into the river bottom, said Gregory P. Smith, the marina's supervising dockmaster. Yet the ice floes wrenched them out of the muck like reeds.

On Wednesday, an ice floe rammed into a dock at the marina and laid waste to dozens of planks. The 4-inch-by-8-inch lumber was splintered like matchsticks. Mr. Smith estimated that the ice caused about \$130,000 in damage this week.

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When E Dock was repaired, the dolphin at the south end of the E Dock T, was replaced with a cluster of three stand alone steel pilings with no cabling or I-beams to sister or bind them to one another or together with the one wood piling at the south end of the E Dock T. This cluster or one wood piling essentially anchors the E Dock T – Wave Wall ice barrier which once again is the main deterrent to flood ice flows at the southern entrance.

Entrances ice barriers



Northern entrance with old floating docks as ice barrier between head of A Dock and head of C Dock.

Camels with high freeboard and good cleats and eyes were used for years to plug the opening between the heads of A and C and the opening between the E Dock T and the south end of the wave wall. The camels were chained in place but the chains could be released on one end to flush ice floes out of the Basin or allow a vessel to enter or depart the Basin. There has been an increasing use of floating docks, sometimes tied in place with line, in recent years. Some rundown camels (known to some as WMDs or Weapons of Mass Destruction) with low freeboard were brought in but eyes and cleats were in bad shape.

The Basin's first line of defense at the entrances became dependent on old floating docks and the run down camels. A few easy ice seasons led to the 2008-2009 season, when, for the first time since the Basin was opened 70 years ago, no barriers were in place before the first ice floes arrived:



The first significant flow of ice arrived on January 16, 2009 after 6 days of sub-freezing temperatures and Coast Guard ice reports showing the ice was coming. The floes poured in all areas with each tide cycle. Basinites were up at all hours poling ice floes away from their hulls and cursing Parks' new technique of virtual ice barriers such as the one shown in the A Dock – C Dock opening in the photo. Virtual ice barriers are cheap and easy to install but transparent to an ice floe moving at 3 or 4 knots..



Photo at left shows the south side of C Dock the day after the ice arrived. For three days, the floes were poled and no barriers were installed during the 3-day Martin Luther King holiday weekend. Floating docks were installed the following week across the two entrances. The southern entrance ice barrier consisted of old D dock floating docks and shattered on the flood flow of ice. Once again, floes banged on the hulls. A weary Basinite said, "It sounds like thunder inside the boat." One floe was spotted with bottom paint swatches of red ("Argo"), green ("Raquelita") and blue ("Prelude") . "



Eventually, the low freeboard camels were chained in place across the southern entrance. Of course, there were no more ice flows the rest of the winter.

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PRESENT

Current Boat Basin Ice Protection

What does this mean to you as we approach the 2009-2010 ice season?

The Basin's current ice protection has progressively worsened and is at the lowest level since Parks took over management of the Basin in the 80's. With the addition of the southern extension of the head of C, the floating D and E Docks and the more exposed wave wall over the years, the Basin needs more ice protection, not less.

We're still exposed in many ways to the dangers of river ice:

- The two most important ice breakers are unfinished. No peeler rails were installed. The I-beam collars are mounted too high.
- The dolphin between the outboard ice breakers is missing.
- More A Dock planks are missing than present.
- Floating docks and substandard low freeboard, waterlogged camels or WMDs are planned for plugging the two entrances. Floating docks, when used as a first line of defense against ice floes, will eventually be overwhelmed.
- The steel pilings installed near the dolphins on the A Dock head, the C Dock head and the wave wall are not sistered to the dolphins. For example, the three steel pilings at the junction of the wave wall and the southern end of the C Dock extension were driven out in the ice flow stream and were not cabled, I-beamed or otherwise attached to the existing dolphin.
- On the wave wall and C dock head, fifteen facing planks are missing and sixteen are loose. Most of the facing planks have been sheared off by the ice to the lower whaler level allowing floes to enter the Basin.
- The E Dock T pilings cluster is the weak link in flood ice flow protection. If it gives way, E Dock may try to merge with D Dock again.
- The derelict barges are derelict in their duty to take the flood ice flow pressure off E dock.

Normal ice winter

If it's a normal winter, more facing planks may be lost and floes may enter the Basin through the facing planks gaps and underneath the whalers. Figure on some sleepless nights poling ice pancakes and floes away from your boat. It's important to keep any floes out of the Basin and flush floes out periodically. Otherwise, floes will be banging on the hulls days after the ice flow ends.

Other than bottom paint being scraped off near the waterline, fibreglas vessels have not incurred damage to the gel coat or hull structure so far. The "Aleta" and Chris Williamson's "Argo's" wooden hulls are special cases. When bottom paint is scraped off by the floes, a delicious bare wood feast is provided to the marine borers or worms. A shipyard haulout and bottom planks replacement for Argo costs more than the worth of some Basin vessels.

There is an additional danger to having floes inside the Basin now that we have the ferries rush hours twice a day. It's possible for hull damage and sinking after a ferry wake rolls your vessel and there's a thick (up to 18") ice floe between your hull and the dock. This problem will be compounded if the Coast Guard's proposed move of the mid-river anchorage to the western shore is approved. The move would squeeze the river traffic closer to the Basin thereby increasing the size of the wakes.

Black Swan ice winter

If it's a Black Swan ice winter and we have several subfreezing weeks in a row, the ice fields upriver will thicken and creep southward toward the Basin.

If we have a strong ebb ice flow of thick floes with an astronomical spring tide and a west to north wind:

- The two outboard ice breakers could be bowled over. A Dock could sustain major damage.
- The floating docks that serve as ice barriers between the heads of A and C could break up in the same manner as the E to wave wall barriers did in January; Floes could damage the pilings and finger docks of the outer slips of C Dock and the vessels in those slips..
- C Dock extension southern end planks could be smashed again.
- The stand alone steel pilings installed after the 2004 winter may get knocked over by the ice flows.

If we have a strong flood ice flow of thick floes:

- The E Dock T pilings cluster could be bowled over and the ice field could damage E Dock, D Dock and the vessels in the outer slips of C, D and E.
- The E to wave wall barrier itself could give way with the same results.
- The E to wave wall barrier's old camels have lost their humps, i.e., no freeboard. Ice floes could enter the Basin over the camels.
- E Dock could try to merge with D Dock again during a strong flood flow since the grounded barges are below water at high tide and provide no ice protection.

Ice forecast

The USCG and Stevens Institute are working on an ice forecasting system based on the Stevens temperature measurement stations up the Hudson and a Massachusetts ice forecasting system. Hopefully it will be available by next ice season and we'll know with more certainty when the first ice flow should arrive.

In the meantime, you can forecast the ice flows yourself:

1. Enter in your browser address bar: "homeport.uscg.mil" or click on <http://homeport.uscg.mil/mycg/portal/ep/home.do>
2. Click on "Port Directory".
3. Click on the drop-down menu next to "Baltimore".
4. Select "New York"
5. Select "Ice Operations" in the Waterways Management section
6. Select the latest date ice report (at the bottom of the list) and the latest ice photos (be sure to look at the date on each individual photo) of the George, the Tappan Zee and upriver
7. Compare with the next to the latest ice report for a rough idea of how the ice is moving

You can shorten this procedure with bookmarks. Other information that may be of aid:

- Ferries between Haverstraw and Ossining being canceled.
- Local news/weather/traffic segment every half hour on the Today Show shows real time ice flow at the Tappan Zee Bridge which is 19 miles from the Basin
- The 2008/11/26 Ice Definitions PDF (second entry in the ice reports list) defines the terms used on the ice reports.
- The NOAA 7-day forecast <http://iboatnyharbor.com/weather.htm> If the NYC highs are below freezing for a week, we could see ice flow.
- The NOAA hourly forecasts for the next 3 days <http://iboatnyharbor.com/weather.htm> If the winds are out of the N , NW or W, the ice will tend to flow along the Manhattan shore.
- Current times and strength <http://iboatnyharbor.com/Currents%20and%20Tides.htm> If you click on "Today's Water Levels at the Battery", you can deduce real-time current strength from the real-time observed water levels.

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PFUTUREPfantasy Pfuture: ICE

- Glenn McCoy cartoon, NY Times

So it was with great relief that we were notified that the Obama administration's stimulus program was trickling down funds through the City and Parks to provide ice protection infrastructure at the Basin and Parks decided to spare no expense protecting the Basin from ice. [No e-mails, please, remember we're in the Pfantasy Pfuture section]

A fast track contract was issued and the following were implemented:

- Peelers for the two outboard ice breakers were installed below the Lowest Observed tide level.
- The key missing dolphin was installed between the two outboard icebreakers.
- A Dock gaps and wave wall gaps were eliminated by installing, where needed, new pilings, whalers and facing planks that extended below Lowest Observed tide level and were through bolted at all whaler levels.
- Stand alone steel pilings were sistered to the structures or dolphins they were supposed to strengthen.
- Southern ice breakers were installed. [Two of the old stone block quays in front of the Battery Coast Guard Building were removed. No home for the blocks could be found and they were barged upriver. The stone blocks would have made a great ice barrier south of the Basin. -Ed]
- Custom barge for the northern entrance was built and chained in place during the winter. In the summer the barge would be used as a dinghy dock and Triathlon dock.
- A trapezoidal barge for the southern entrance was built and chained in place during the winter. The outer end of the barge would hinge to the southern end of the wave wall. The inboard end was designed to release floes entrapped in the Basin. In the summer, the inboard end of the barge would be swung out into a position parallel to and aligned with the wave wall. The barge

would provide wave attenuation for E Dock and additional dockage space and revenue as an extension of the wave wall.

Cri de Coeur

Except for Commissioner Benepe, current Parks managers have not been through a heavy ice winter. The past winters have been relatively ice free but Parks cannot depend on global warming to keep providing light ice winters. From the Wikipedia entry on the Black Swan Theory:

Taleb states that a Black Swan Event depends on the observer—using a simple example, what may be a Black Swan surprise for a turkey is not a Black Swan surprise for its butcher—hence the objective should be to "avoid being the turkey" by identifying areas of vulnerability in order to "turn the Black Swans white".

The objective of this document has been to identify the areas of Basin vulnerability to river ice. To ensure that the Black Swans do turn white, the Basinites desperately need Parks to invest in ice protection.

Parting proverb

The ice was here, the ice was there.

The ice was all around;

It cracked and growled,

And roared and howled,

Like noises in a swound!

- *From "Rime of the Ancient Mariner" by Samuel Taylor Coleridge*

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