

## TORNADOES IN THE PACIFIC NORTHWEST

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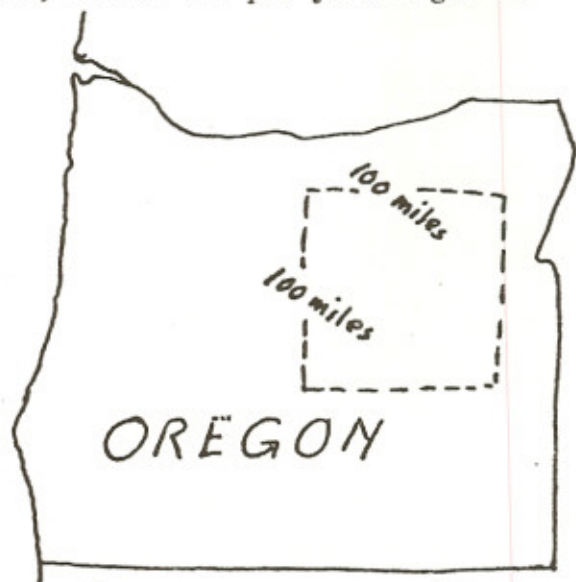
Those of us who live in the northwest often refer to it as "God's Country." It's not much of an exaggeration. We are multi-blessed. One of our blessings is a gentle weather pattern. Violent storms are a rarity. As such when they do occur they are memorable.

On April 5, 1972 the Portland-Vancouver area was hit by the worst tornado to ever touch down in God's country. It was violent, caused six deaths, over three hundred injuries and five to six million dollars in damages. It caught the author's attention and was the root of this article.

Tornadoes are most common in the afternoon, in the spring of the year, and in the midwestern U.S.A. which is called "Tornado Alley."

They have occurred however at all hours, at all seasons, and on every continent. Oklahoma has the greatest frequency in the world, 8.8 tornadoes per year per 10,000 square miles, with Kansas (6.4) and Indiana (6.1) running close behind. Oregon and Washington have a low 0.17 tornadoes per year per 10,000 square miles. This means that in a 100 mile square area (See Fig. 1) you could watch for 6 years before you would expect to observe one tornado. In this entire state of Oregon - also Washington, one or two per year might be normal.

What is a Tornado? They are severe local storms composed of one or more violently rotating columns of air. The air rises in the column (See Fig. 2) while the column itself begins in thunderclouds and develops downward. It is not a tornado until it contacts the surface of the earth. At this time it can do vast damage to any objects on the surface. Tornadoes are nature at its most extreme.



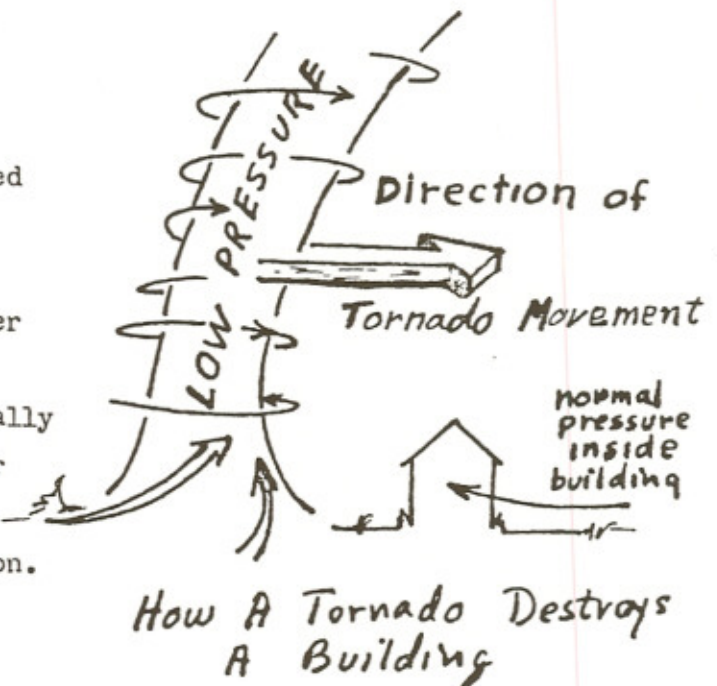
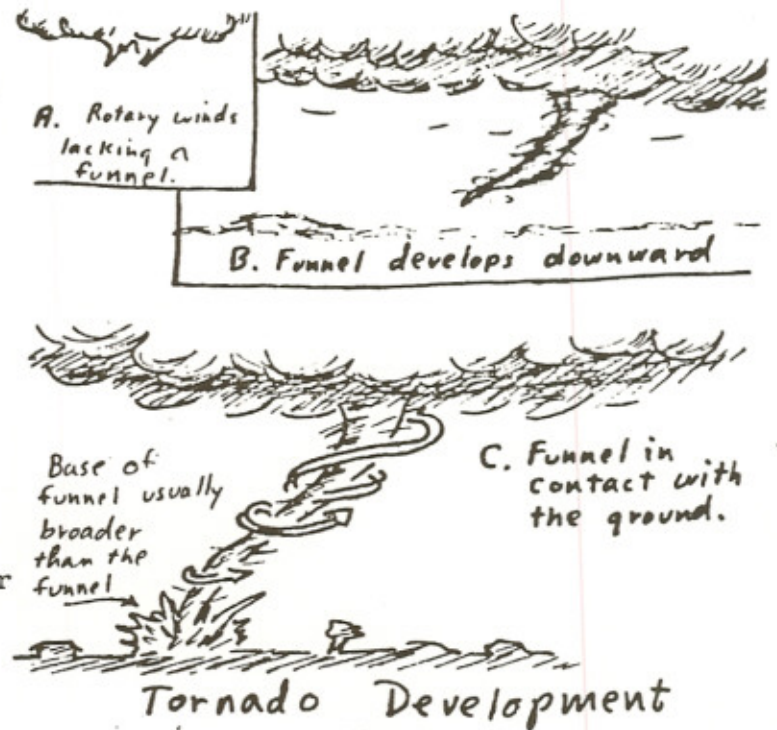
A 10,000 Square Mile  
Area of Oregon.

Fig. 1

The rotating funnel cloud creates very high winds, possibly 300 m.p.h. not far from its center. This funnel may be only a few yards across but could be as large as several hundred feet. Strong winds may extend several hundred yards from the center. Near the axis of this rotating column of air a vacuum is generated. We don't know how low the pressure gets at the center because any time we have been fortunate enough to have recording instruments near the center they have unfortunately been destroyed.

The tornado funnel has been called nature's vacuum cleaner since dirt, debris, and objects are swept into the funnel and upward. The funnel may be very dark, filled with soil and other materials. Over water this becomes a water spout, and tons of water may be carried upward, giving it a different and lighter appearance.

Consider a building in the way of a moving funnel. (Fig. 3) The unfortunate structure will first be hit by winds in one direction at maybe 175 m.p.h. If this does not destroy it, it will then be engulfed by the low pressure area of the tornadoes center. This happens quickly enough that the pressure inside of the building is higher than that outside. This is often enough pressure difference that the building literally explodes. Usually the building is no longer standing--but its wreckage will then be hit by high speed winds in the opposite direction. The destruction is total.



Lubbock, Texas was hit by a ferocious pair of tornadoes on the evening of May 11, 1970. Research into the damage and the pattern of the damage indicates that a mature tornado has a more complex suction system than the above description indicates. This research shows that a mature tornado funnel probably contains three or more "suction spots." These are low pressure spots within the main funnel. As the funnel moves these spots rotate. (See Fig. 4.) The most extreme damage is found in circular "swipes."

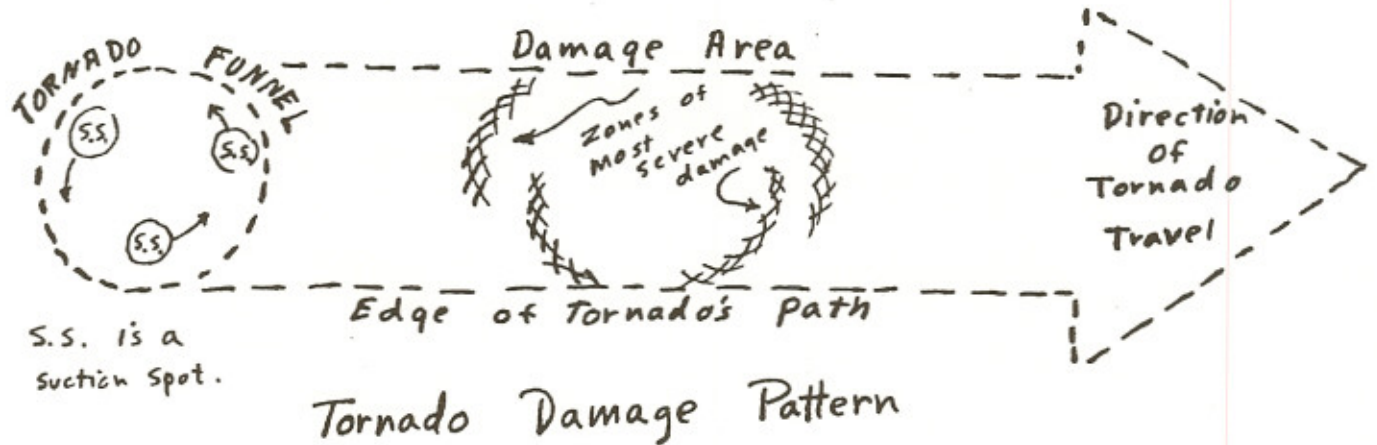


Fig. 4

The stage is set for tornado birth when two contrasting air masses (See Fig. 5) come in contact. This happens often in the mid-west when the warm, moist air of the gulf moves north to interact with the dry cooler air of the middle continent.

A similar situation occurs when warm and cooler air masses interact over Oregon and Washington, as in Fig. 6. This is the situation, familiar to every TV weather watcher, of a low pressure center, with its cold and warm fronts attached. This low pressure center moves across the world's face, usually west to east. These frontal zones carry much moisture and precipitation (hatched areas) with them.

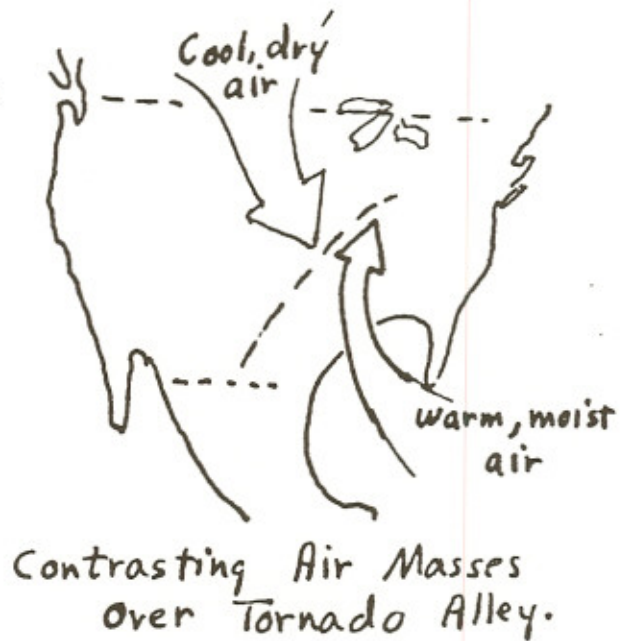
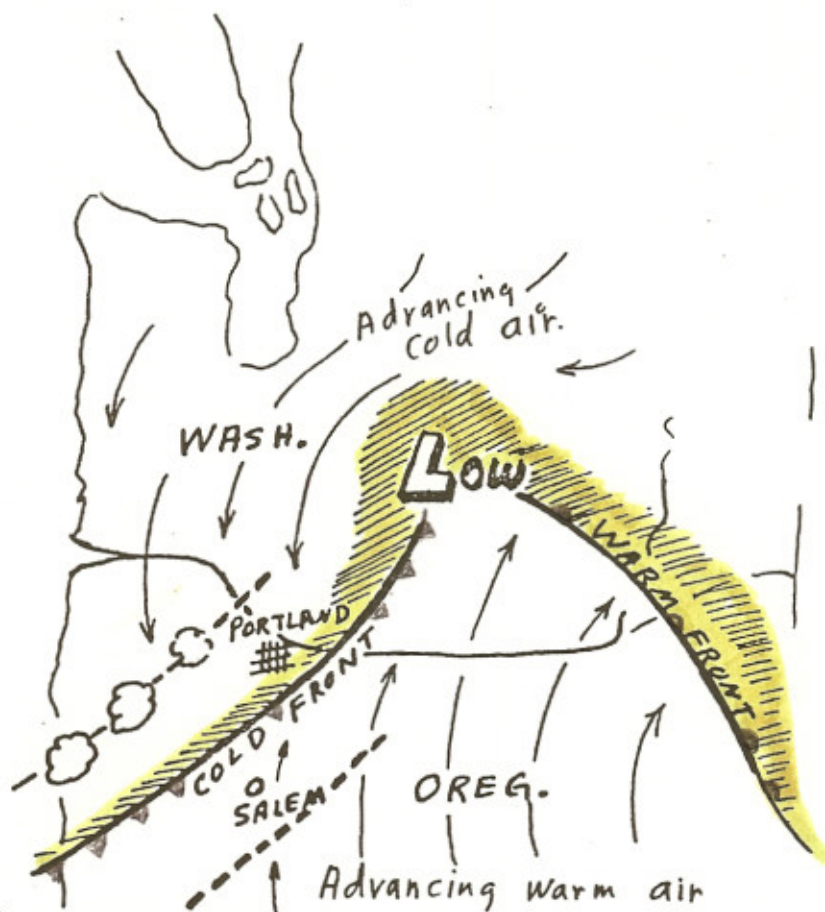


Fig. 5

These cold and warm air masses have somewhat contrasting characters. The more contrasting the more unstable the situation, and the more likely that tornadoes will occur. When these fronts move across the Pacific Northwest they rarely breed tornadoes, but when the rare tornado does occur it is usually in connection with a frontal zone.

Thunderstorms are often found imbedded in a cold front. Sometimes several occur in a row. They are then termed a squall line. These squall lines can also be found leading or trailing behind a front--see dotted lines of Fig. 6. The squall line has been observed to be the birthplace of tornadoes. A cold front as well as these squall lines often lie SW to NE. The most common behavior of a newly spawned tornado is to travel toward the NE parallel to the front or squall line.



A Cyclonic Storm System moves across the Northwest. The hatched areas are precipitation zones.

Fig. 6

PORTLAND - VANCOUVER AREA, April 5, 1972

The "twister" that hit the Portland - Vancouver area on this Wednesday was a tornado -- at least most observers agreed on this. An element of doubt existed because a clear cut funnel was not officially observed. The U. S. Weather Bureau called it a tornado in their reports.

Radar had followed a Eugene to near Newport squall line as it moved up the valley toward Portland. This squall line was intensifying. At 12:00 noon it had reached the Portland area.

The barometer had been falling during the last 12 hours. At 12:15 PM the barometer was at 29.50 inches and by 12:55 PM reached 29.34 quite a low reading. One half hour later it had climbed to 29.48 inches. See fig. 7.

These pressures were recorded at the Portland Station of the U.S.W.B., in sight of the storms path. The graph shows clearly the decrease in pressure that is characteristic of the passage of such a storm. About 12:55 PM, roofs were being blown off of the moorages and boat sheds along the Columbia River.

The progress of this storm might best be appreciated by a series of interesting observations.

Observation No. 1:

The author was involved in teaching a 12:00 PM to 2:00 PM physics lab in room C-17 of the Science Technology building at Portland Community College. (See map Fig 8 ). The room is equipped with a sensitive weather instrument-- a ventilator duct which rattles when a high wind blows. On this day, sometime near 12:45 PM, it set up a racket unprecedented. I went outside and was so impressed with the sudden violent wind that I called the class outside to see it.

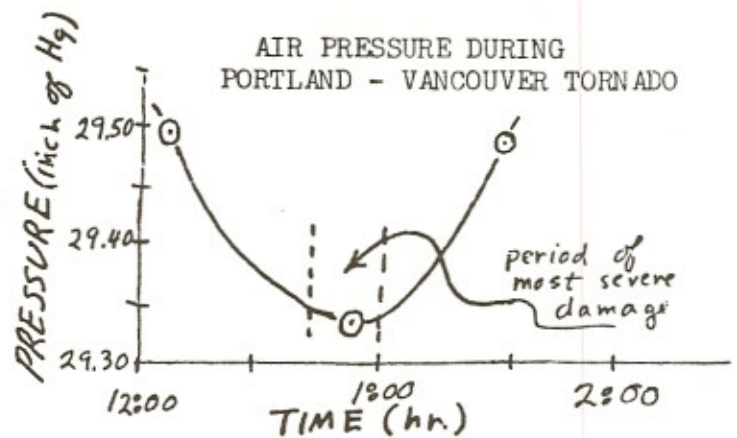
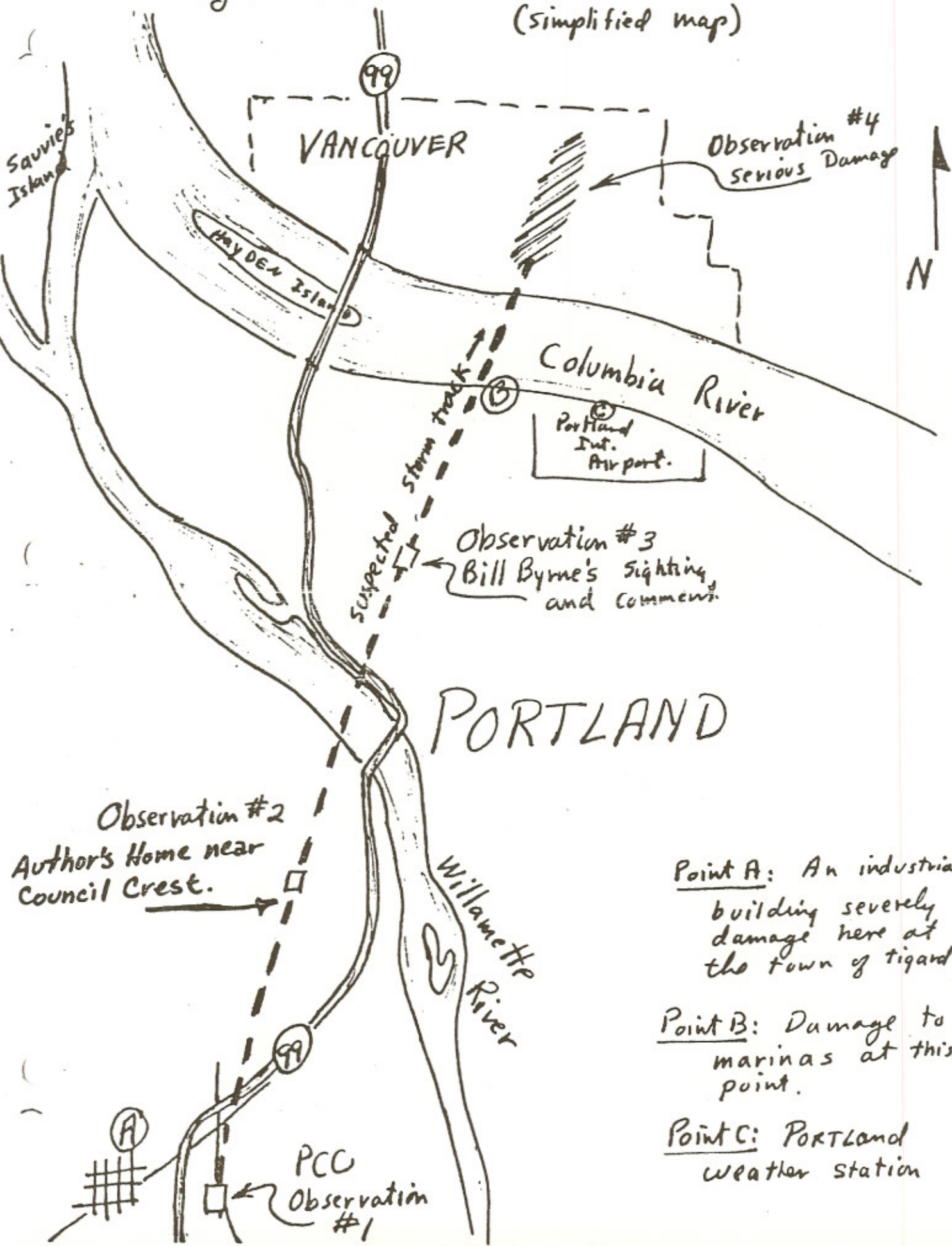


Fig. 7

Fig. 8 PORTLAND-VANCOUVER TORNADO  
(simplified map)



Point A: An industrial building severely damaged here at the town of Tigard

Point B: Damage to marinas at this point.

Point C: PORTLAND weather station

North of the building a very black cloud could not be overlooked. For a few minutes the southwest wind presented violent gusts. A small light plane a mile northeast of the campus was trying to progress to the southwest, right into the wind. It was standing still --- no progress. Also it was visibly being buffeted about. The winds died and we returned to work. The lights went out for several seconds. About the same time an industrial building in Tigard was torn up by high winds.

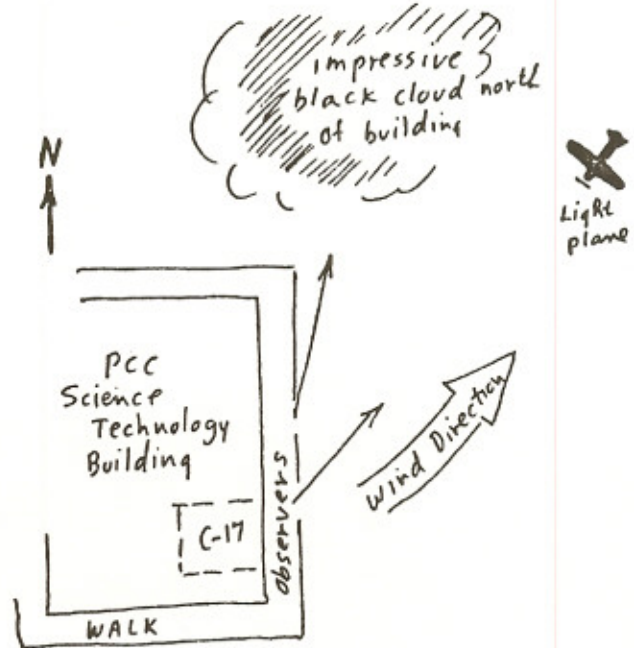


Fig. 9

#### Observation No. 2:

Sometime between 12:30 PM and 1:00 PM the authors wife Gerry looked northward from her Council Crest home. Over Canyon Road, dense, dark clouds hovered. Lower wisps began to be taken up into the clouds by a visible rotary motion. An opening upward into the clouds, centered on the rotation, was clearly observed. The dog was nervous, came beside her and whined. She was about to call her mother to come and look when a sudden gust of wind burst open a poorly latched window and glass went flying 30 feet. This event distracted her from the cloud formation.

#### Observation No. 3:

Bill Byrne is a young man from Minnesota, the author's nephew, and a University of Portland student. He was visiting a girl friend Cecelia Carlson, near N.E. 39th and Killingsworth. As he looked in a southwesterly direction out of the window at the approaching black cloud he said aloud, "If I was in Minnesota I'd get in the basement." A short while later a pole went down nearby and their lights went out.

Observation No. 4:

At 12:46 pm. the twister moved across the Columbia River. Having given the Oregon bank of the river a parting blow and according to one witness, sucking water up from the Columbia River, it slammed into the east suburbs of Vancouver, Washington. See Fig. 10. The first damage was at *Halstad St.* from which it moved on in a northeasterly direction. The destructive path was rather straight several miles long and with precise limits. Some trees were toppled eastward and some to the northwest, giving evidence of the rotary winds. James Wakefield, meteorologist at Portland estimated these winds at 115 to 125 mph.

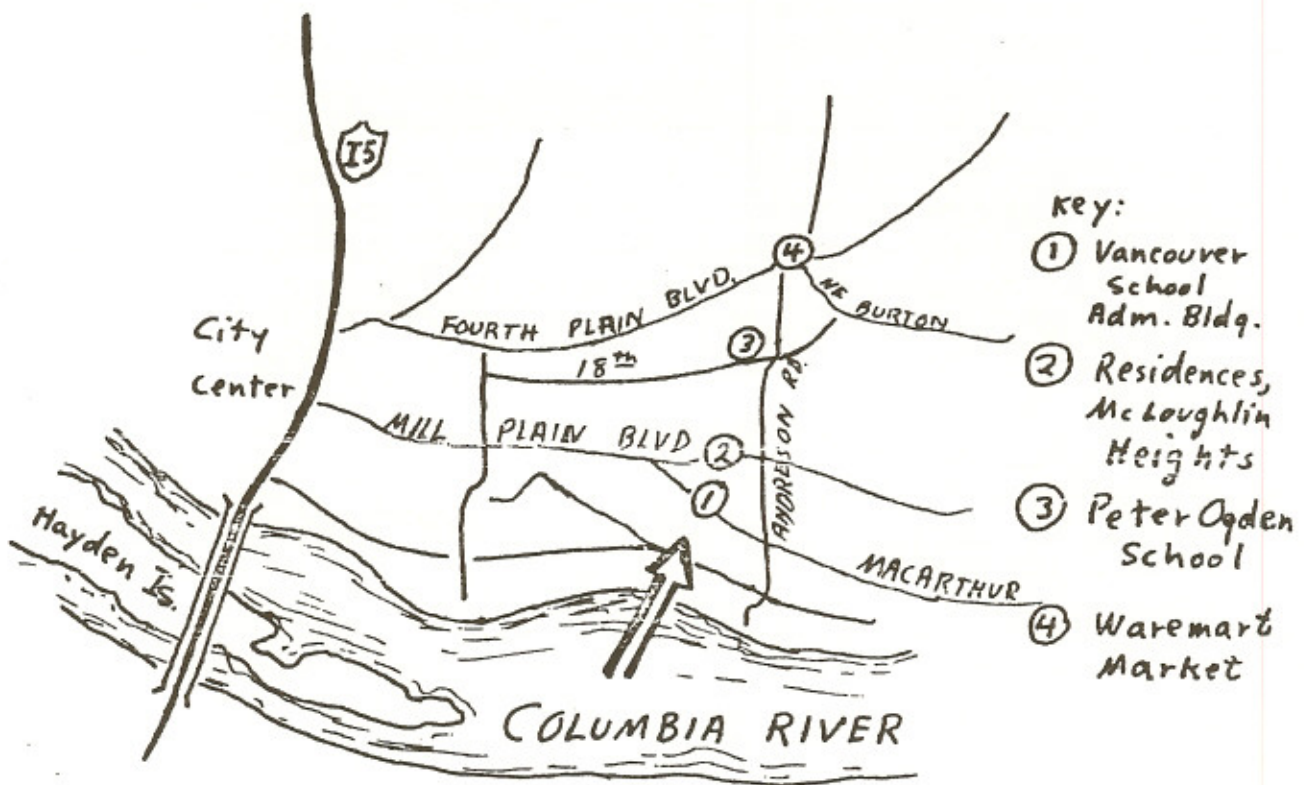
At the same time that a young Fort Vancouver high school student stepped to an outside balcony to "sneak" a smoke, the tornado arrived at the nearby Peter Ogden School. He described a "large swirling cloud of dust moving across the field. Hugh timbers just floated lazily around it." He estimated the base at 500 feet across. Speaking of the Peter Ogden building--"the roof sort of lifted off, twisted, turned over a few times, then disintegrated over the playground" (north of the school). 50 out of 541 students were injured at Peter Ogden. Governor Dan Evans commented after looking at the wreckage, "I am astounded no one was killed here!"

After viewing the area Governor Evans declared this a disaster area. Six were dead, and 304 injured. On Friday, two days later, 40 were still in the hospital with two listed as critical. Insurance estimates were put at above three million dollars. Six major commercial or public buildings and 50 homes were damaged or destroyed. Three miles of broken poles and lines left 2400 people without phones. Cars were turned upside down. A common report was that of roofs "peeling off."

Over and over in human events we have seen the strange phenomem that the human "varmint" is often at his best in emergencies. The Fort Vancouver High School students who rushed across to the Peter Ogden school to help the hard hit grade schoolers, were receiving high praise. The owners and operators of a half dozen heavy cranes who quickly appeared to render assistance have been lauded. In surprisingly organized fashion 20 ambulances responded, cutting red tape in their hurry to get the injured to the hospitals--afterward they were wondering how or with whom to place charges. Four Air National Guard and two Air Force Reserve helicopters were also present on the scene helping all they could.

The doctors and staff at St. Joseph's Hospital received the largest flood of injured since they were close by. What a way to begin...St. Joseph's was brand new, having just opened its doors nine days before. They took in 250 patients, and 43 remained in their wards.





PATH OF STORM THROUGH  
VANCOUVER

FIG. 10

Possibly the most impressive view of this storm is through the eyes of those who stood in its pathway, ducked flying debris, and then described it. The 21 teachers who were serving at the Peter Ogden grade school that day are an intriguing group, whose behavior in those wild seconds should bring pride to each of us who labor in the educational "vineyards", and should have made several of them instant candidates for the "teacher of the year" award.

Tom Kennedy was one of the sixth grade teachers. He is so youthful looking and light of spirit that some parents might wish for more evidence of maturity and the wisdom that sometimes comes with age. On this Wednesday the parents got a bargain. Mr. Kennedy described the overwhelming sound as a "wail ---a high whine." The Oregonian quotes him---

"I was unlocking the door as the kids were coming in from noon hour--- half were in--- when the hailstorm hit us showering stones the size of golf balls."

"Then the wind exploded. We herded the kids to the west side of the building to get them out of the flying debris. Then the wind changed (direction) and flying objects began coming right at us. So we moved the whole bunch of them around behind the building and up against a wall. Debris went over the top of us, and all around us, but nothing seemed to touch us."

Mr. Kennedy said it was "less than a minute." Then he noticed that his leg was bleeding.

What is surprising to this author is the amount that went unsaid in the news coverage of those days, but it was well worth recording. On April 8th, two days later, one had to search the newspaper for the one article related to it.

For example the newspapers failed to note two youngsters being rolled along with debris across a field. They would stand up, fall, stand up, be blown down, stand up, and be knocked down again. It was Kennedy who went out from shelter to pull one of these boys in.

Tom Kennedy may be among that very select group of people who knows what the inside of a tornado looks like. Looking upward he found that his view was right up through the center of the rotary motion. Large chunks of debris were soaring in curved paths. One huge piece of roofing debris smashed down 20 feet from the

Kennedy's group of huddled students.

The actions of one audacious youngster deserved to be recorded. As the nearly "golf ball" sized hail began to pound the youngsters from the east---a few seconds later it would be driving at them from the west--one boy was seen to be swatting at the hailstones with a baseball bat.

Joyce Hesla is a young, blond, attractive woman who was also a sixth grade teacher at Peter Ogden and tells her experiences in an animated fashion. If others have doubt about whether a funnel cloud accompanied the storm, Joyce does not. She was in an outside position able to watch as the storm approached. She observed the partially developed funnel coming over the hill southwest of the school. The clouds were very low and the funnel did not quite contact the ground.

A small creek lies between the hill and the school. High school students reported seeing water and mud sucked up into the funnel as it passed. Joyce only had time to walk a few steps before the full fury hit.

As much as one-half hour previously children had observed the interesting sky. Some girls called Joyce's attention to the "colored lightning (reddish orange)--the clouds are really neat." From the start of the hail, until the wind had mounted to such a degree that the hail was flying horizontal, could be measured as about 10 steps. When the most intense winds subsided, a drenching rain began.

What are the odds that in Vancouver, Washington where tornadoes "never" occur, that when the "one in a million" storm does occur there will be on hand a person who knows exactly the right thing to do--and does it?

The fifth grade teacher was Lowell Ericksen who grew up in Nebraska and Chicago. From his classroom window he saw the signs--lightning, hail, rapidly moving clouds--and read those signs correctly. When the violence hit his classroom he had already shepherded his children behind the chalkboard--coat room divider. Can you see him grabbing one child who thinks running is the best move and pulling that youngster back into the shelter. As the storm subsided the youngsters rushed to get out of the room. The doors were blocked and they couldn't get them open. They didn't need to. The outside wall was missing. They just walked out.

Several people reported "feelings," physical sensations associated with the storm. Possibly they could be caused by the pressure changes. Joyce Hesla stated that she felt "eerie---like 'poof'---a bodily feeling---a cottony feeling."

It is interesting to note that each participant did not hear the storm the same. Whereas Mr. Kennedy heard a whine, Edna Tidwell who taught the first and second grade described a "woof---woof---woof" sound. She first became aware of the storm when she looked out to see flying materials. She said to her class "look at the farmer's boxes, they're up in the air." Lettuce fields were adjacent to the school. Hail was pounding now. She moved with several girls toward the windows. She reports that at that moment the windows blew inward. Miraculously, no serious injuries were sustained from this flying glass.

Edna felt herself driven backward against a wall, the wind so tremendous she couldn't even bend over to get under a table. Edna didn't realize the roof had blown off, until she felt the rain pouring in. All the classrooms lost their ceilings.

Sue Krause was a teacher's aid assisting in the second grade. She also observed the flying hail, boxes, and debris. The windows became so covered with hail that it looked to her as if they were painted white.

She laughingly describes trying to get under a school desk. A second adult had the same idea. She says they both managed the impossible task "without even a foot sticking out."

Sue Krause describes the fright of the very little children. Their unanimous response to nature's worst storm was "I want to go home." Sue responded with "You can't -- just pray now." All the little heads, in Sue's words, obediently went down, "blip--blip--blip--."

A grading period was coming to an end. Tom Kennedy had completed his grading and his cards were bound together in a desk drawer. They remained in place. Joyce Hesla was not finished with her cards and they sat in a pile on the same desk. Can you imagine their distribution after a tornado hit that desk?

During the storm uprooted trees and roof beams were seen to be flying parallel to the ground. A "jungle gym" was hit by one of these, and the pipe structure was bent almost flat.

The gymnasium was torn to pieces. As the storm struck a group of 15 students were in the gym getting ready for a spelling bee. A few minutes later the entire school would enter the gym to witness the event. The death toll would have been high if the student body had been already in the gym bleachers. As it was these students felt that they were blown out of the gym. Along with them went flying debris and bricks. Some who were hit with these bricks gave the strange report that it was like being "hit by marshmallows."

Such an experience is not easily forgotten. Joyce Hesla described trying to sleep the night after, but a "film loop" in her head kept insisting on "replaying the whole thing." Almost a year after she is "starting to trust buildings again." Many students remain skitterish and edgy when a wind blows or the rain is heavy. One student grabs her teacher and wants to go inside. Another sometimes gets sick and goes home from school. There is trauma.

It's not easy to forget the dark interior of the nearby machine shop which was the nearest available shelter from the drenching rain. The interior was packed with sweating, bleeding, sick and vomiting people, mostly children. In the "power out" darkness they could not find the toilet, and many were crying. There were many in pain.

All effects were not negative. These people felt drawn together--closer than they had ever been. As the storm disappears, a boy is holding his little sister on his lap to comfort her. Earlier they had been fighting, and later on they would fight again.

Beyond the Peter Ogden school nature planned a further attack, and this time there would be fatalities. At the intersection of Fourth Plain Blvd. and 72nd Ave. (see Fig. 10) stood the Waremart (discount store), and nearby the Sunrise Bowling Lanes. Thomas Fuller, 25, Army Spec. 4, was one of the Waremart shoppers at the time of the tornadoes arrival. Thomas Fuller was quoted as follows:

"The lights went out--I thought we had been hit by lightning. Then, all hell broke loose. The roof began to peel off---stuff began to fall---20 or 30 shoppers ran for the front door. That's when the front wall blew down, trapping a half-dozen people underneath. I was hit by some falling objects. My arm was injured---I started pulling people out---only three of us were able to walk out under our own power. There was no time for screaming or panic. The wind lasted only about one and a half to two minutes."

The most tragic events of all occurred here. A young mother age 25, was in her automobile in the Waremart parking lot with her 5 year old daughter and one week old son. As the building tore apart, flying debris crushed their car and took their lives. Inside the building another mother, 22 years old, and her three year old son were crushed under the front wall as it fell inward.

Across from Waremart at the bowling lanes the 6th death occurred. As the full fury of the wind and pressure differences pulled the bowling alley apart it seemed that 40 women bowlers were spared by a minor miracle. They had moved to a restraurant area at one end of the building. The roof at the other end of the building from which they were eating collapsed. There was a hesitation during which they and their children rushed outside. Then the rest of the roof fell in. In an area used as a nursery a wall collapsed and killed one woman who was in that area. This woman's son was in the Peter Ogden school. He escaped but she didn't.

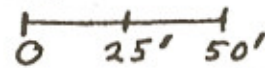
Now let's take a backward look from Vancouver. The damage done on the Oregon side of the Columbia went almost unreported. Let's look at it rather closely.

The storm damage in Vancouver included deaths and vast destruction. By comparison the damage on the Portland side was trivial. However to those few who were hit it was far from trivial.

Wayne Low runs a boat gas and service facility at the end of the north walk of Daniels Marina. (See map, Fig. 11 ) His home, a houseboat, is there as well as his office and service equipment. Mr. Low was in a position to observe the effects closely, both during and immediately after the damaging blow. In fact he was such

# - COLUMBIA RIVER -

Approx. Scale



Dolphins broken just east of map. →

CLIFF'S MARINA  
and  
TOBY'S MARINA

COLUMBIA  
CORINTHIA  
MARINA

DANIEL'S MARINA

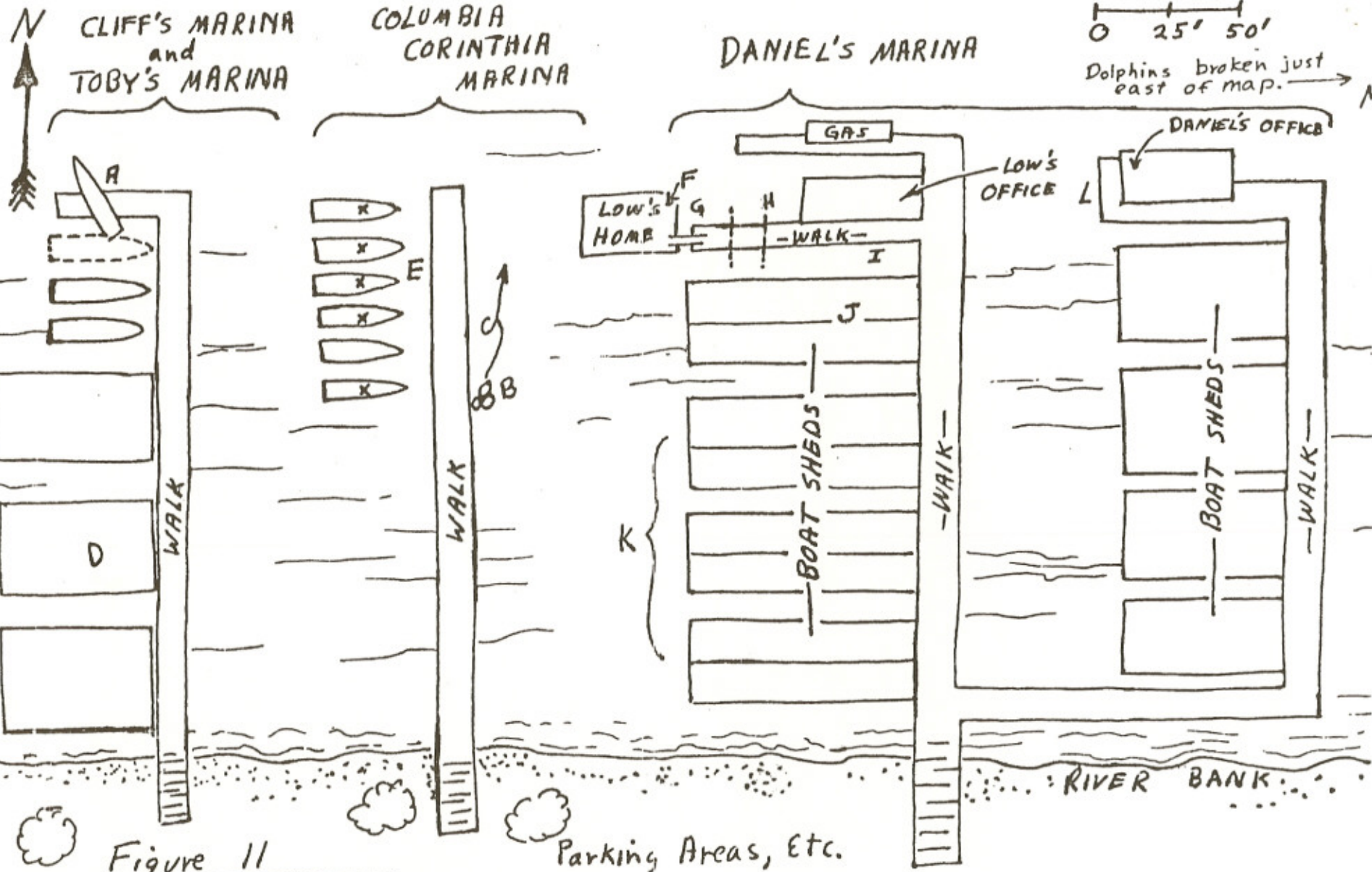


Figure 11

SIMPLIFIED MAP  
of the 3400 BLOCK OF  
N.E. MARINE DRIVE  
PORTLAND, OREGON

N.E. MARINE DRIVE

a close observer that if he had been a few feet one way or the other he may easily have been killed.

The following narrative is written from Wayne Low's description and words:

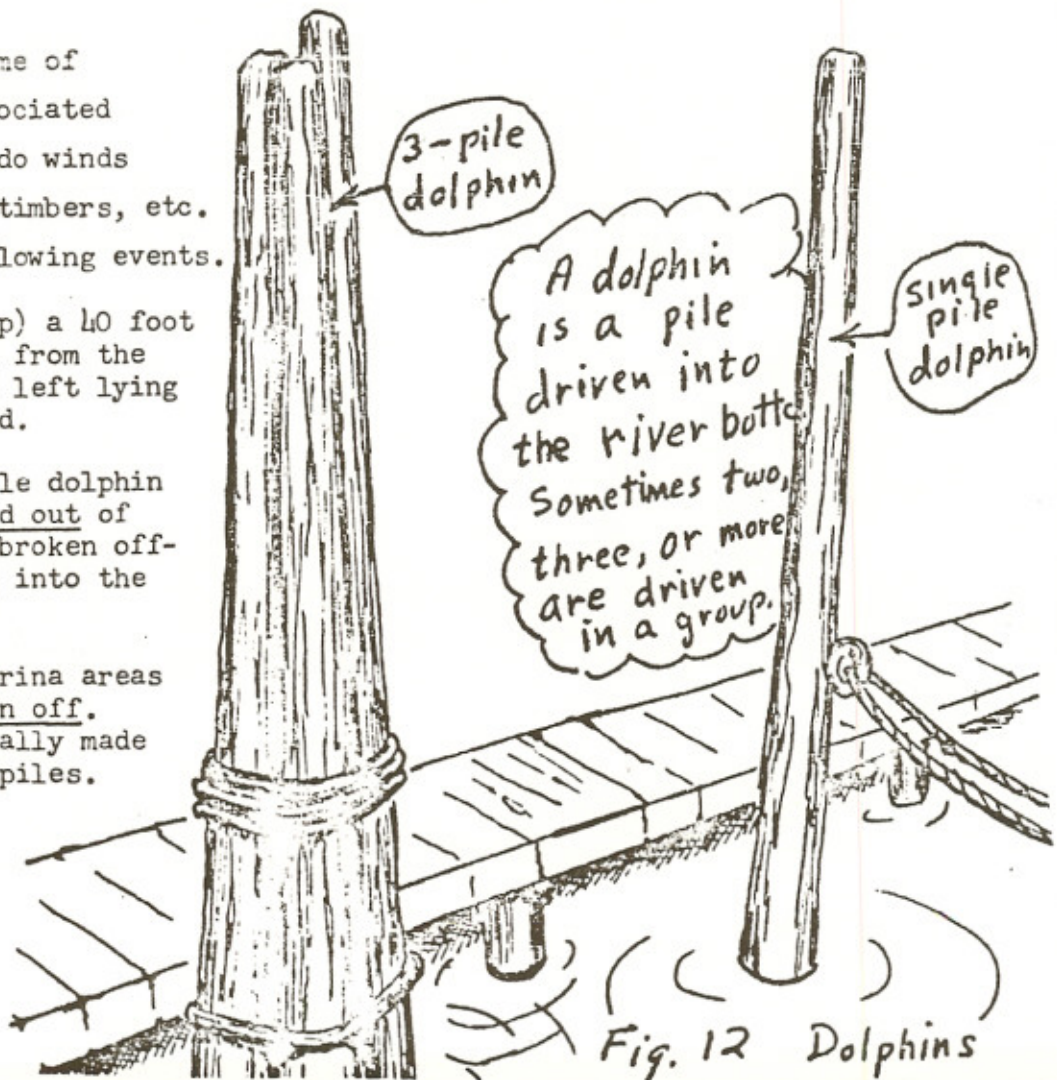
A friend associated with the Port of Portland had made a direct call to him to point out that wind warnings for up to 50 mi/hr had been issued. He had busied himself tying down boats, etc. As he returned to his office he realized the wind had become fierce and saw a 25' sailboat which was capsized, had broken its mooring and was drifting out into the Columbia. He stepped inside the office and dialed the sheriff's office to tell him of the drifting boat. At this moment the noise level hit a high point. The office building was trembling, and out the windows he could see materials flying through the air. He laid down the phone and the sheriff had the strange experience of observing a tornado by telephone--he heard the sounds, no video. Wayne Low estimates that the destructive part of the storm lasted about 30 seconds. Before this period was finished he sensibly got down behind a display case believing that the window glass would soon fly.

Everyone has heard of some of the fantastic events associated with hurricane and tornado winds --straws driven through timbers, etc. Consider some of the following events.

(A) At point A(see map) a 40 foot sailing boat is lifted from the water(dotted line) and left lying across a walk, demasted.

(B) At point B a 3-pile dolphin (see Fig. 12) is sucked out of the river bottom--not broken off and sent cart wheeling into the Columbia

(C) In these three marina areas 33 dolphins were broken off. These dolphins are usually made of about 18" diameter piles.





The boat shed at point D is turned upside down. The roof was inverted, the supporting posts had their bases pointed upward, the walkway to it was twisted. It was sheltering approximately eight pleasure craft. They were sunk and never recovered.

(E) At point E, five out of six sailing boats were demasted, probably they were hit by sheets of flying tin from the shed roofs.

(F) Wayne Low had a wind indicator at this point on top of his houseboat. The instrument's scale went to 120 miles per hour. Obviously it had never reached the maximum before. After the storm it was found to have its armature melted. No one was watching to see where the needle was when it quit.

The Low's home was moored as shown in Fig. 13. Eight three-quarter inch braided cables were holding the boathouse. After the blow six of them were parted. The floating house was swinging out toward the river on the other two--but oddly enough almost no damage was sustained by the house itself.

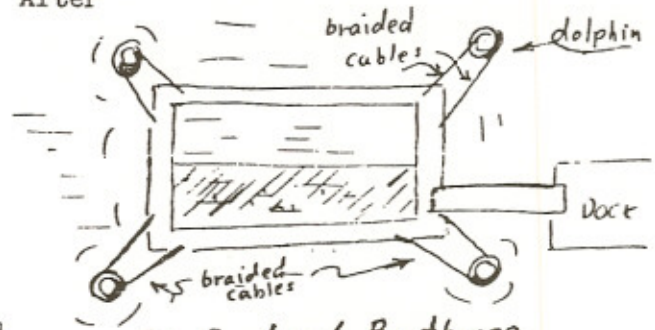


Fig 13. Low's Boathouse

(G, H) Between points G and H were stacked oil barrels and other paraphenalia. The dotted lines indicate a 15' space from which all of this material was blown away. The rest of the materials were unmoved.

(I) Wayne Low's 14 foot runabout, with canvas curtains, etc. sat here unscathed but

(J) At point J the boat shed was destroyed, part of the roof blowing off, while part collapsed downward upon boats below.

(K) The south sides of these roofs had all the tin blown off, while the north side was lifted, bolts sheared off, and dropped back--but displaced a few inches.

(L) Some pillows and a deck chair are blown off the porch of this building. No other damage.

(M) A small amount of damage was done at one of the adjacent moorages to the east.

When the violence passed, Wayne Low looked out at the river, saw no funnel, had the definite impression that the visibility which had been very limited and foggy had immediately cleared. The water was full of drifting boats and debris.

The damage in this very limited area would total more than \$100,000.

Enterprise, Oregon June 11, 1968

The Portland-Vancouver tornado wins the prize as the big "baddy"--no contest, but it is not by any means the only violent storm of note. On June 11, 1968 a twister touched the surface 30 miles north of Enterprise, Oregon. This area was uninhabited, and it may not therefore have been witnessed. At least I have found no record of an eyewitness. Therefore it did not rate much coverage in the news media at the time. When timbermen had visited the area however, they found 1800 acres of prime timber destroyed and another 1200 acres seriously damaged. This amounted to 40 million board feet and five million dollar loss. The destruction path was about ten miles long and from 800 to 3500 yards wide.

Kent, Washington, December 12, 1969

A funnel, some say two, was sighted about 2:10 P.M., southeast of Maury Island over Puget Sound. (See Map, Fig. 14) It moved to the northeast passing over the mainland just north of Saltwater State Park. As it cross Highway 509 it seemed to remain "airborne", taking off the tops of tall firs and bending a tall T.V. antenna at 242nd St. and 13th Place. South it damaged a house and camper and knocked down some trees. It's first severe ground contact came in the Highland Community College parking lot where several auto windshields popped out from the pressure differential. Ten autos were severely damaged while the aluminum light poles were being twisted.

At the intersection of the Pacific Highway (U.S. 99) and the Des Moines-Kent Highway a gas station was damaged and a part of the roof lifted off a furniture store.

It roared on---spectators heard it---across Interstate 5, damaging a camper trailer, lifting the roofs off three homes on Military road, and shearing off power poles. Acres of trees were shredded as it plunged down the west wall of the Green River Valley. Here it showed its most violent tricks---fortunately the area is not highly developed. A house was twisted 45° and moved 25 feet from its foundation. Damage to a barn and house occurred at 216th St. A panel truck ended up on top of the wreckage of this barn---having been carried 100 feet. The residents of this house plunged to the basement when they spotted the funnel, but were not too busy to see the funnel change from black to white as it sucked up Green River water.

On Frazer Road it poked out almost every windowpane in the greenhouses. Thirty feet above the ground it wrapped a telephone pole in corrugated metal. At Russell Road a youngster was injured by a collapsing garage.

Now it bore down on the Boeing Space Center Complex--it's most impressive target. Torandoes however are fickle and unpredictable. It lifted instead, doing only some window and roofing damage, and left the earth's surface. The time was 2:30 P.M.

It had begun from a thunderstorm between Maury Island and Woodmont Beach, traveling northeast at about sixteen miles per hour. Its damage path being about 100-200 feet wide. There were no fatalities. Just 2 injuries. Unofficially the damage seemed to be \$500,000.

Seattle, Washington, September 28, 1962

The first tornado ever observed in Seattle was relatively small. Among the observers were the weather personnel at the Sandpoint Naval Air Station. They had the experience of watching one of the hangars be extensively damaged as the tornado crossed the base. It then moved across Lake Washington developing a small waterspout before it hit land near Juanita Point on the eastern shore. The path was about 3 miles long and 30 yards wide. It had damaged residences, trees, etc in the View Ridge and Juanita Point area. Before it lifted off its price tag would approximate \$100,000.

This "first" in the Seattle area was in the latter part of 1962. It is interesting to speculate why in a short nine year period there should be six more. They occurred on the following dates:

9-28-62 (the first)

5-7-63

8-18-64

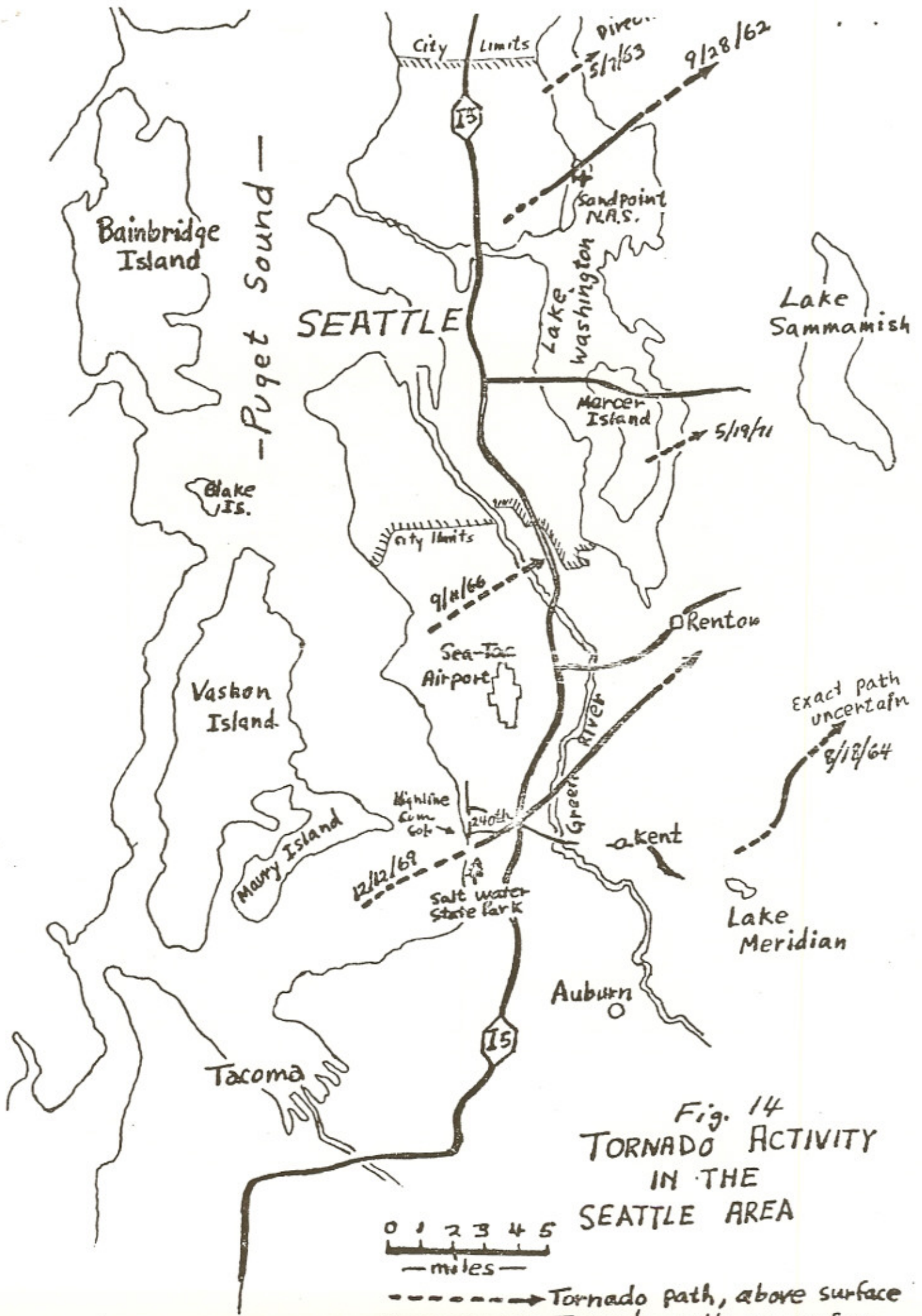
9-11-66

12-12-69 (Kent)

5-19-71

Fig. 14 shows their approximate location, etc.

Has there been some pattern or circumstance established that stimulates the birth of these monsters? Will there be more? Will one strike the populous parts of Seattle, thus far avoided?



TORNADOES DOCUMENTED IN OREGON AND WASHINGTON  
1887 to the Present

YEAR	DATE	STATE	PLACE	TIME	REMARKS
1887	6/14	Ore.	Lexington Morrow Co.	-	1 person dead, considerable damage
1887	6/14	Ore.	Long Creek Grant Co.	-	Damaged timber
1925	4/15	Ore.	Condon Gilliam Co.	10:30 AM	One-half mile wide, NE path: \$10,000 damages to warehouses, etc.
1925	4/15	Ore.	Salem Polk-Marion Co.	11:00 AM	5 mile path, some damage.
1926	2/19	Ore.	Near McMinnville Yamhill Co.	-	trees felled, some other damages
Previous to 1951		Wash.			Records concerning tornadoes in Washington State before 1951 are very "skimpy." Technical Paper No. 20 (Sept. 1952) prepared by the Climatological Services Division of the Weather Bureau noted one tornado in each 1916, '24, '36, '49. Damage was negligible. No injuries, no fatalities reported.
1951	10/2	Wash.	Battleground	3:10 - 3:40 PM	8 mile path, 35 yd. wide. Leisurely movement, 30 min. to travel 7-8 miles. Two-story barn destroyed 1 mile west of battleground. Cornfields and fruit trees destroyed. Some trees looked like they were pulled <u>straight out</u> of the ground.
1951	12/6	Ore.	Eugene Lane Co.	3:40 - 3:53 PM	500 yd path, S.W. Machine shed damaged.
1954	6/15	Wash.	Spangle	1:30 PM	\$6000 damage. Either a very large dust devil or small tornado.
1954	10/22	Ore.	15 mi SW of Portland Wash. Co.	3:35 - 3:45 PM	One-half mile path, 15 yds wide, between Hillsboro and Orenco.
1956	5/9	Wash.	10 mi. south of Kennewick	12:45 - 1:00 PM	- -
1957	4/12	Ore.	Sandy Clackamas Co.	12:00 Noon	2-3 mile long path, 35-50 yds. wide, NW direction \$5000 damage to trees, barn, buildings.
1957	4/12	Ore.	Gilliam Morrow Co.	12:30 - 12:45 PM	One telephone pole lifted out of ground. 15-20 mile path, 100-400 yd. wide.
1957	4/30	Wash.	Yakima Area	-	Suspected small tornado, associated with dust storm.
1957	5/6	Wash.	Spokane Area	-	- -

YEAR	DATE	STATE	PLACE	TIME	REMARKS
1957	5/20	Wash.	Spokane and Lincoln Co.	-	Funnels aloft.
1958	4/24	Wash.	20 miles NW of Walla-Walla	3:15 PM	- -
1958	6/26	Wash.	Walla Jct. Walla-Walla Co.	6:00 PM	Est. \$15,000 damage. Small cabinet shop and marine supply building. Two boats, one 30 ft. cruiser, damaged one-fourth mile, 50 yd. wide path, N.N.E.
1959	4/30	Wash.	Colton Union Town	4:25 PM	- -
1960	3/8	Ore.	Marion Co.	3:15 PM	1 mile, 50 yd wide path. 3 homes and some farm buildings destroyed. \$5,000.
1961	5/1	Wash.	Walla-Walla Co.	Aft.	- -
1962	5/8	Wash.	Near Lower Monumental Dam	2 PM	Exceptionally heavy rain and hail followed - some crop damage.
1962	5/19	Ore.	10 miles south of Klamath Falls	Approx. noon	One-half mile path, 20 yds. wide. Estimated \$2,500 damage, hay barn, etc.
1962	6/26	Wash.	Near Spokane	3:22 PM	Funnel observed 2 miles west of Spokane airport. Funnel extended down for about 3 minutes. Did not contact ground.
1962	9/28	Wash.	Seattle	4:57 PM	The path was 3 miles long, approx. 30 yds wide. A small tornado. This was the first ever observed in Seattle. It moved NE crossing the end of the sand point Naval Air Station and Lake Washington. In the View Ridge area a roof of one residence was severely damaged. Windows and trees damaged in a very narrow path. The roof of one hangar on NAS damaged extensively. Navy weather personnel sited and observed this funnel as well as other people. A small waterspout developed. Hit east shore near Juanita Point damaging residences and trees before dissipating. Estimated damage, \$100,000.
1963	5/7	Wash.	Seattle	3 PM	Small funnel observed over North end of Lake Washington by NAS weather personnel--it did not reach the surface, but persisted about 4 minutes.
1964	5/22	Wash.	Spokane Co.	1:35 PM	- -
1964	5/22	Wash.	Walla-Walla Co.	2:19 PM	- -
1964	8/18	Wash.	East of Kent	10:45 AM	8 mile long, 30 yd. wide path. Near Lake Meridian. Funnel visible for several minutes. Damage in forest. Heavy showers and thunderstorms Seattle concurrently.
1965	5/23	Ore.	Near Forest Grove Wash. Co.	Late PM	Damage to cornfield and prune orchard. Est. \$5,000. One-fourth mile long path

YEAR	DATE	STATE	PLACE	TIME	REMARKS
1965	11/10	Ore.	Rainier Columbia Co.	2:55 PM	One-half mile path, 15-20 yds wide, NE direction. Damaged 2 small buildings. Traveled as waterspout crossing the Columbia River.
1965	11/10	Wash.	- Same as above -		
1966	3/14	Wash.	15 miles NE Spokane	11:47 AM	Funnel cloud reported
1966	5/25	Ore.	Ontario Malheur Co.	5:10 PM	12 mile path, up to 100 yds. wide. NE direction. Trees, telephone poles, etc., damaged.
1966	9/11	Wash.	King Co.	1:06 PM	3 miles north of Sea-Tac airport. Funnel showed for 5 minutes, traveling in NE direction. Estimated 10,000 foot funnel, 600 feet wide at top, 150 ft. wide at tail, didn't get within 300 ft. of ground.
1966	10/20	Ore.	Seaside Clatsop Co.	3:30 PM	Path 10-20 yds. wide, 1/10 mile long. Damage of about \$6,000 to one city blk. store windows, electricity, and telephone lines.
1967	6/21	Ore.	Malheur Co.	Afternoon	narrow, one-half mile long path, NE direction. Damage to sagebrush, etc.
1967	10/3	Ore.	Near Astoria Clatsop Co.	1:05 PM	one-half mile long, 70 yd. wide path, easterly direction. Damaged several homes.
1968	6/11	Ore.	Enterprise Wallowa Co.	4:00 PM	8-10 miles, 800-3500 yds. wide path. 30,000 acres of valuable timber damaged. About 40 million board feet lost. Hail 1.5" size. Over \$5,000,000 damage.
1968	10/13	Ore.	20 miles SW Portland Wash. Co.	1:00 PM	100 yd. path. Touched down only briefly.
1969	12/12	Wash.	Kent	2:10- 2:30 PM	See complete description of this in attached article.
1970	2/17	Wash.	West of Hoquiam	12:22 PM	Pilot reported funnel cloud.
1970	4/11	Wash.	- -	2:08 PM	Not confirmed.
1970	5/11	Ore.	9.5 miles NW of Warm Springs Wasco Co.	2:15 PM	Short path, open land.
1970	6/26	Wash.	SW of Bellingham	2:24 PM	Pilot reported funnel cloud.
1970	6/29	Wash.	NW of Spokane	Evening	15 pine trees uprooted.
1970	7/25	Wash.	WNW of Kennewick	4:04 PM	Funnel aloft - 7 grass fires started by lightning.
1970	11/24	Wash.	NE of Marysville	6 AM	Small tornado, touched down briefly. Two barns damaged and a dairy shed destroyed. 2 cows killed.



Y	DATE	STATE	PLACE	TIME	REMARKS
1971	3/24	Wash.	NW of Quillayute	5 PM	Two funnel clouds moving east, viewed for about 20 min.
1971	5/19	Wash.	Seattle Area	8:05 PM	Small funnel over east channel of Lake Washington
1971	5/25	Ore.	Near McMinn- ville, Yamhill Co.	3:55 - 4:20 PM	1/10 mile path, 25 yd. wide. Light damage (\$1000) to farm house and barn.
1971	8/30	Wash.	Near Colfax	4:30 PM	Tornado associated with a line of severe thunderstorms. Barn demolished roof carried into adjoining field. Piece of wood driven through a steel water tank.
1971	10/26	Wash.	10 miles NNE of Monroe	1:55 PM	Near Lake Loesige . 3 water spouts over the lake observed. Touched down 5 times, irratic path. 20 acres of timber damaged, circular pattern shows in downed timber.
1972	4/5	Ore.	- -	12:46 PM	This tornado passed over Portland crossed the Columbia, and on into Wash. See complete write-up in accompanying article.
1972	4/5	Wash.	- -	-	-
1972	4/5	Wash.	Creston, 40 miles west of Spokane	5:20 PM	3/4 mile long path.
1972	4/5	Wash.	Mouth of Colville River	6:00 PM	One mile long, 100 yd. wide path. Tree damage was circular.