Seaside Municipal Airport (56S)
2797 US 101
Seaside, OR. 97138
(503) 738-5112

DRONE FLIGHT AUTHORIZATION

- Register your Aircraft @ www.faa.gov/uas/registration

Flying your UAS (Drone) within 5 miles of the Seaside Municipal Airport

- Contact your local Airport @ (503) 738-5112

What we need from you when you call the Airport for notification:

- Where you will be operating (address or latitude/longitude)
- The altitudes at which you will be flying (below 400 feet above ground level)
- What type of flying activity you will be doing
- The number of aircraft and a basic description of the aircraft
- When you will be flying and for how long
- Your name and a method of contacting you such as a cell phone number

Inspect your Drone for any damage before flying

You are officially a Pilot, safety is in your hands

Maintain your Pilot Safety Record by following the rules

- Fly at or below 400 feet
- Keep your UAS (Drone) within sight
- Never fly near other aircraft, especially near airports
- Never fly over groups of people
- Never fly over the Promenade, homes, hotels, or beach events
- Never fly near emergency response efforts
- Never fly under the influence
- Be aware of airspace requirements

Download the App **B4UFLY** for additional information.

Contact Information: First Name:_____ Last Name: _____

Cell Phone Number: _____ Email: _____

Flight Location:_____ Flight Date:_____

NOTE: Authorizations are for a 24 hour period only

Email or text the completed form to: dmcdowell@cityofseaside.us

Gmail by Google

Krysti Ficker <krysti@cityofgearhart.com>

Selective Service System is seeking Board Members in Clatsop County

Medina, Edward <Edward.Medina@sss.gov> Fri, Apr 19, 2019 at 1:12 PM

We could use your help by volunteering or by spreading the word.

Due to some recent retirements and relocations, we are seeking Local Board Members in your community.

A Selective Service Local Board is a group of five citizen volunteers whose mission, upon a draft, will be to decide who among the registrants in their community will receive deferments, postponements, or exemption from military service based on the individual registrant's circumstances and beliefs.

How Local Board Members are Appointed
Local Board members are appointed by the Director of Selective Service in the name of the President, on recommendations made by their respective state governors or an equivalent public official. If you are interest in serving as a Local Board member, you may apply online for an application. Some **requirements** to be a board member are that they be:

- U.S. citizens
- at least 18 years old
- not a retired or active member of the Armed Forces or any Reserve component
- live in the area in which the board has jurisdiction
- be willing to spend enough time at the position.

During Peacetime
The Board Member program is one of the primary components of the Selective Service System. Over 11,000 volunteers are currently trained in Selective Service regulations and procedures so that if a draft is reinstated, they will be able to fulfill their obligations fairly and equitably. Board members undergo an initial 8-hour training session and then participate in annual training in which they review sample cases similar to real-life situations. Peacetime commitment is approximately 8 hours the first year and 2 hours every year after that.

During a Draft
Registrants with low lottery numbers will be ordered to report for a physical, mental, and moral evaluation at a Military Entrance Processing Station to determine whether they are fit for military service. Once he is notified of the results of the evaluation, a registrant will be given 10 days to file a claim for exemption, postponement, or deferment. At that time, board members will begin reviewing and deciding the outcome of the individual registrant's case. They may personally interview the registrant and persons who know him to gain a better understanding of his situation. A man may appeal a Local Board's decision to a Selective Service District Appeal Board.

https://www.sss.gov/Volunteers/Board-Member-Program

Thank you for your time.

Ed

https://www.sss.gov/

Ed Medina

Gmail by Google

Krysti Ficker <krysti@cityofgearhart.com>

Fwd: Thank you for your efforts on Gearhart Dune Restoration and noxious weeds

Chad Sweet <chadsweet@cityofgearhart.com> Thu, Apr 25, 2019 at 2:26 PM
To: krysti@cityofgearhart.com

Please include in correspondence

---------- Forwarded message ---------
From:**Margaret Marino** <mmmarino@msn.com>
Date: Thu, Apr 25, 2019, 6:30 AM
Subject: Thank you for your efforts on Gearhart Dune Restoration and noxious weeds
To: councilorsmith@cityofgearhart.com <councilorsmith@cityofgearhart.com>
Cc: mayorbrown@cityofgearhart.com <mayorbrown@cityofgearhart.com>, councilorcockrum@cityofgearhart.com <councilorcockrum@cityofgearhart.com>, councilorjesse@cityofgearhart.com <councilorjesse@cityofgearhart.com>, councilorfackerell@cityofgearhart.com <councilorfackerell@cityofgearhart.com>, Chad Sweet <chadsweet@cityofgearhart.com>, peter@peterowattspc.com <peter@peterowattspc.com>, Dianne Widdop (r_widdop@msn.com) <r_widdop@msn.com>

Councilor Smith,

I want to thank you. Over the last several years your efforts to begin the restoration of the Gearhart Dunes as well as your diligent oversight through the 10 months since the revised code was put into place is truly appreciated. Beyond your leadership of the Dunes Committee, you have continued to impress upon the Gearhart City Council that the best practices your committee generated are critical to ensuring prevention and control of noxious weeds. During the January 2019 City Council meeting, the Mayor and City Attorney both acknowledged the State of Oregon requires the city to do this work and the limited city budget is inadequate for the work that needs to be done.

> ORS 569.180 states: "…noxious weeds are declared to be a public nuisance and shall be eradicated….It is declared to be the policy of this state that priority shall be given first to the prevention of new infestations of noxious weeds and then to control and, where feasible, eradication of noxious weeds in infested areas."

The Dunes Committee meeting on June 14, 2017 included discussion of the leadership role and community outreach done by the North Coast Land Conservancy during the month of May, promoted as Broom Buster month. The audience in attendance at your meeting included members of the North Coast Land Conservancy, the Necanicum Watershed, Clatsop County Soil and Water Conservation District, former Gearhart City Mayor Dianne Widdop along with several homeowners. It was clear you and specific committee members understood and agreed how important the month of May would be for Gearhart in going forward with active management and control. One committee member extended that conversation to include responsibility for a similar plan for Gearhart and her dedication, deep knowledge and involvement with NCLC.

You and the Council are to be commended for enabling the work to go forward on Dune Meadows Park at the start of 2019. The hand cutting and removal of all old growth noxious weeds will be instrumental in future control of an area that was in severe neglect (Photo-Dune Meadows Park-1/19/2019).

On April 4th, 2019, you and two other councilors had the opportunity to meet in the dunes and jointly review the work being done that day. Hopefully the next time such a meeting occurs, the discussion can be open to the rest of the community so we can all learn about the progress being made.

The work you're doing for noxious weed management in 2019 is key to allowing the city to apply for the Oregon State Weed grant for 2020. It is unfortunate the city did not apply for a portion of the $1.33 million that was granted this past February for 2019 calendar year. I know you will guide the city to ensure a timely submission this December to enable additional funds for the city budget.

We are now entering the month of May and your leadership for our own Gearhart "Broom Busters" month will make such an impact for our community.

Margaret Marino

PO Box 2353 Gearhart

Please include this with the rest of the correspondence in the May City Council packet.

---

2 attachments

image002.jpg
60K

image002.jpg
60K

To the Mayor and City Council of Gearhart

The Gearhart fire station will not survive a moderate earthquake, and a new station is warranted. The debate over the optimal location of the new station has involved statements about tsunami height and probabilities that are contradicted by DOGAMI documents and the inundation map for Gearhart, which show for example that the Pacific Way station is nearly as safe as the Park station site. For example, consider this quote from a recent article by R.J. Marx in the Seaside Signal:

> "The likely tsunami would not be a giant wave that crashes over the foredunes in Gearhart, the city's firehouse committee reported. It will most likely be a surge of water that floods the estuary and low lying areas with flood waters first, rising up to 50 feet. The water will then recede in west Gearhart after three to four hours. 'Therefore there are evacuation areas toward the ocean in Gearhart along Marion that are relatively safe and may be good locations for a new station,' the committee wrote." (Seaside Signal, April 5, 2019, Top Story)

This is an example of many statements within the Gearhart firehouse documents that are directly contradicted by DOGAMI figures and publications. Contrary to these statements, DOGAMI sources show that:

1. The highest likelihood tsunami height at Pacific Way from a mega-event is about 30 feet, not 50 feet.
2. The L1 tsunami height is not 50 feet at the Pacific Way station, rather 40 feet, about two feet below the roof.
3. The L1 tsunami scenario does inundate the Gearhart Park location, and its elevation is 60 feet at Ocean Avenue, not 50 feet.
4. The probability that the Pacific Way station is flooded by any mega-event tsunami is 21% (3.6% over the next 50 years), not large
5. The probability that the Gearhart Park location is flooded by any mega-event tsunami (17.8%) is about equal to the probability that Pacific Way station is flooded (3.0% over the next 50 years).
6. The L1 tsunami would breach the Gearhart dune front from Pacific Way to 10th Avenue.
7. The probability that the next tsunami from a major event floods the Pacific Way station is close to zero (2%), not large.

To be completely clear, and to avoid any misunderstanding, in the following I systematically explain each of these points with a screenshot of the pertinent DOGAMI document, annotations, full reference to the publication, and URL

where it can be accessed. Everybody can easily verify for themselves exactly where this piece of information originated, and I encourage them to do so.

1. The highest likelihood tsunami height at Cottage Avenue is about 30 feet, not 50 feet. The highest probability earthquake scenario is M1, as indicated in Witter et al. (2013) (see Figure 1). Note that Witter et al. (2013) state "Scenario M1 carries the highest weight and represents the 'most likely' event in our analysis". This weight (probability) is equal to 31.8%, higher than any other scenario. See also Figure 2 from the Gearhart-Seaside Tsunami Inundation Map (Priest et al., 2013). This is a W/E cross section through Gearhart at South Ocean Avenue. Note that I've annotated in Figure 2 the height of the M1 (the light purple color band) as 30 feet at Cottage Avenue. This elevation can also be checked on the Gearhart LIDAR maps on the City website.

2. The L1 tsunami height is not 50 feet at the Pacific Way station, rather 40 feet, two feet below the roof. I've also indicated in Figure 2 the L1 elevation at Cottage Avenue of 40 feet. The height of the station is 42 feet. A second story with evacuation roof would escape all Large tsunamis.

3. The L1 tsunami scenario does inundate the Gearhart Park location, and its elevation is 60 feet at Ocean Avenue, not 50 feet. Notice I've annotated the 60-foot elevation corresponding to the L1 scenario at the dune front, which is the darkest yellow-ochre color band. This indicates that the L1 tsunami is predicted to reach 60 feet at the Gearhart dune front.

4. The probability that the Pacific Way station is flooded by any mega-event tsunami is 21% (3.6% over the next 50 years), not large. Pacific Way station is located just east of Cottage avenue, and its foundation is at 28 feet. The M1 scenario reaches to 30 feet at this location, two feet above the current foundation. If the rebuilt station were elevated two feet, it would be above the M1 scenario maximum inundation. The probability that a mega-event tsunami is M1 or below is the sum of all the probability weights at M1 or below in Figure 1. This sum equals 79%. So, the probability that a mega-event tsunami floods the station is one minus 79% or 21%. Because the 50-year probability of a mega-event is 17% (Kulkarni et al., 2013, see Figure 3), the 50-year probability that a mega-event occurs and floods the station is $21\% \times 17\% = 3.6\%$.

5. The probability that the Gearhart Park location is flooded by any mega-event tsunami (17.8%) is about equal to the probability that Pacific Way station is flooded (3.0% over the next 50 years). Note in Figure 2 the height of L1 is 60 feet. This tsunami would flood the Gearhart Park Location, whose driveway is at an elevation of approximately 48 to 50 feet. The highest elevation of Gearhart Park is 55 feet as shown by the Gearhart LIDAR map. So an L1 tsunami would flood Gearhart Park station by about 5 to 10 feet of high-velocity current. The total probability weights of L1 and higher, as shown by the table in Figure 1, is 17.8%. This indicates that the total probability that any mega-event floods the Park location is 17.8%. The 50-year probability that a mega-event occurs and floods the Park station is $17.8\% \times 17\% = 3.0\%$.

Note that there is a 79% + 17.8% = 96.8% chance that either the mega-tsunami does not flood any of the three fire station sites, or it floods both the Park and the Pacific Way sites (Figure 1). There are basically two types of tsunamis: either one that does not flood any station (79%), or one that floods both the Park and Pacific Way (17.8%). There is virtually no possibility (3.2%) of any other.

These probabilities can be seen directly in the DOGAMI plot of all mega-events of the last 10,000 years (Figure 4). Note there are 15 out of 19 earthquakes whose sizes do not exceed M and are predicted to be not large enough to flood the Pacific Way station; 15/19 = 79%. Also notice there are 3 events of sufficient size to flood both the Park location and the Pacific Way location; 3/19 = 16%. There was only one event in the last 10,000 years (1500 BC) that was of a size predicted to flood the current Pacific Way station, but not the park station; 1/19 = 5%. We can see in this plot that tsunamis are either (1) the vast majority that do not flood any station, and (2) a small number likely to flood both stations.

I have replotted the data in this DOGAMI figure in Figure 5, with the three fire house elevations included. We can see again that the vast majority of events are not sufficiently large to produce a tsunami runup to the Pacific Way station, while a small minority were sufficiently large to flood both the Park location and the Pacific Way location.

Note also that the 1700 mega-earthquake and tsunami were not large enough to be predicted to flood the Pacific Way station. This prediction was confirmed in tsunami deposits in Cannon Beach (Peterson et al., 2015).

6. The L1 tsunami would breach the Gearhart dune front from Pacific Way to 10th Avenue. Figure 6 shows the DOGAMI Gearhart Inundation Map from Pacific Way to 10th street at Marion and Ocean Avenue. As can be seen, the scenario color is dark yellow-ochre which indicates the Large scenario, and the lighter yellow-ochre which indicates the Extra Large scenario. I have labeled these using red XL and L. Notice the Large scenario covers the entire dune ridge and lower areas to the east and west. The Gearhart LIDAR map indicates that the boundary between L and XL along the dune front here is approximately 62 feet, indicating that the Large scenario is a high-velocity flood of the dune front here to about 62 feet, which is a minimum of 5 feet above the highest point (55 feet) at Gearhart Park, and 12 feet above the approximate elevation (50 feet) of the proposed driveway at the Gearhart Park Station.

7. The probability that the next tsunami from a major event floods the Pacific Way station is close to zero (2%), not large. The authoritative treatment of earthquake probabilites is Goldfinger et al. (2011), who states that the data indicate a "90-percent chance of the next event being a southern margin earthquake" (Figure 7). A southern-margin earthquake is predicted to produce a tsunami whose maximum height at shoreline at Gearhart is about 10 feet, not high enough to flood any of the fire station locations (Priest et al., 2014, see Figure 8).

So the probability that the next earthquake floods the station is the probability that it is a northern or mega-rupture (10%), times the probability that a mega-rupture floods the station (20%), so 10% × 20% = 2%, the probability

that the next earthquake floods the Pacific Way station.

Summary. The Pacific Way station is **far safer** and the Park station less safe, than the City has promoted. The City has stated to residents that the next Cascadia event is imminent, will most likely be Large-1 and result in a tsunami that will flood to 50 feet at the Pacific Way station and at Ocean Avenue, but will not flood the Gearhart Park location or breach the dune. In contrast, DOGAMI documents state that the next Cascadia event will most likely be small (90% probability) and will not produce a tsunami above about 10 feet at shoreline and will not flood any fire station location. If it is Large-1, DOGAMI states that it will rise to 60 feet at the dune front and will both flood the Gearhart Park station and breach the dune front from Pacific Way to 10th street, but will reach 20 feet lower at the Pacific Way station, considerably lower than promoted by the City.

I greatly respect all individuals working on these issues and thank them for the time and effort committed over the last several years. We all want the best for Gearhart. However, **these are major contradictions.** We may have different opinions, but we all need to be on the same page in regard to the facts. The City and DOGAMI appear to be on completely different pages. These differences should be resolved soon so that residents can vote with information provided by DOGAMI, and be allowed to change their vote if they wish, so that decisions are based on the best science available.

Stewart T. Schultz, Ph.D.
Professor of biology at University of Zadar, Croatia
Scientific publications:
https://www.bib.irb.hr/pregled/znanstvenici/289143?report=1
Subjects currently taught: 500-level physical oceanography, statistics and experimental design, marine ecology
Author, *The Northwest Coast: A Natural History.* 2012. Oregon Shores Conservation Coalition.

References

Goldfinger, C., C. Nelson, A. Morey, J. Johnson, J. Patton, E. Karabanov, J. Gutierrez-Pastor, A. Eriksson, E. Gracia, G. Dunhill, and R. Enkin. 2011. Turbidite event history – Methods and implications for Holocene paleoseismicity of the Cascadia subduction zone (No. 1661-F). USGS .

Kulkarni, R., I. Wong, J. Zachariasen, C. Goldfinger, and M. Lawrence. 2013. Statistical analyses of great earthquake recurrence along the Cascadia subduction zone. Bulletin of the Seismological Society of America 103:3205–3221. doi:10.1785/0120120105.

Peterson, C. D., G. A. Carver, J. J. Clague, and K. M. Cruikshank. 2015. Maximum-recorded overland run-ups of major nearfield paleotsunamis during the past 3000 years along the Cascadia margin, USA, and Canada. Natural Hazards 77:2005–2026. doi:10.1007/s11069-015-1689-7.

Priest, G., L. Stimely, D. Coe, P. Ferro, S. Pickner, R. Smith, K. Hughes, and S. Pickner. 2013. Local Source (Cascadia Subduction Zone) Tsunami Inundation Map Gearhart - Seaside, Oregon. Technical report, Oregon Department of Geology and Mineral Industries.

Priest, G. R., Y. L. Zhang, R. C. Witter, K. L. Wang, C. Goldfinger, and L. Stimely. 2014. Tsunami impact to Washington and northern Oregon from segment ruptures on the southern Cascadia subduction zone. Natural Hazards 72:849–870. doi:10.1007/s11069-014-1041-7.

Witter, R. C., Y. L. J. Zhang, K. L. Wang, G. R. Priest, C. Goldfinger, L. Stimely, J. T. English, and P. A. Ferro. 2013. Simulated tsunami inundation for a range of Cascadia megathrust earthquake scenarios at Bandon, Oregon, USA. Geosphere 9:1783–1803. doi:10.1130/GES00899.1.

List of Figures

Table 3. Cascadia earthquake source parameters used to define 15 rupture scenarios. Logic tree branch weights shown in parentheses. Total scenario weight listed in right column.

Earthquake Size	Interevent Time (yrs)	Fault Geometry	Slip Range (m) Maximum	Slip Range (m) Average	M_w	Scenario Name	Total Weight
Extra Extra Large (0.025)	1,200	Splay fault (0.8)	36–44	18–22	~9.1	**XXL 1**	0.02
		Shallow buried rupture (0.1)	36–44	18–22	~9.2	**XXL 2**	0.0025
		Deep buried rupture (0.1)	36–44	18–22	~9.1	**XXL 3**	0.0025
Extra Large (0.025)	1,050–1,200	Splay fault (0.8)	35–44	17–22	~9.1	**XL 1**	0.02
		Shallow buried rupture (0.1)	35–44	17–22	~9.2	**XL 2**	0.0025
		Deep buried rupture (0.1)	35–44	17–22	~9.1	**XL 3**	0.0025
Large (0.16)	650–800	Splay fault (0.8)	22–30	11–15	~9.0	**L 1**	0.128
		Shallow buried rupture (0.1)	22–30	11–15	~9.1	**L 2**	0.016
		Deep buried rupture (0.1)	22–30	11–15	~9.0	**L 3**	0.016
Medium (0.53)	425–525	Splay fault (0.6)	14–19	7–9	~8.9	**M 1**	0.318*
		Shallow buried rupture (0.2)	14–19	7–9	~9.0	**M 2**	0.106
		Deep buried rupture (0.2)	14–19	7–9	~8.9	**M 3**	0.106
Small (0.26)	275–300	Splay fault (0.4)	9–11	4–5	~8.7	**SM 1**	0.104
		Shallow buried rupture (0.3)	9–11	4–5	~8.8	**SM 2**	0.078
		Deep buried rupture (0.3)	9–11	4–5	~8.7	**SM 3**	0.078

*Scenario M1 carries the highest weight and represents the "most likely" event in our analysis.

17.8% = prob of flooding Park and Pacific

79% = prob that all stations escape flooding

Figure 1: Cascadia earthquake source parameters and probability weights. Source: Witter et al. (2013). Note the odds of a tsunami flooding at M1 or below are 79%; the odds of flooding both the Park and Pacific Way stations are 17.8%. https://pubs.geoscienceworld.org/ssa/geosphere/article/9/6/1783/132896

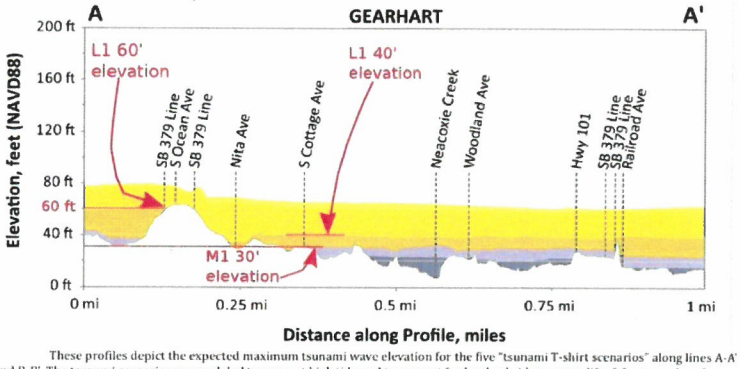

Figure 2: Profile of expected maximum tsunami inundation from the five event scenarios at South Ocean Avenue. Source: DOGAMI Gearhart-Seaside Tsunami Inundation Map (Priest et al., 2013). Note: L1 elevation is 60 feet at the dune front, and 40 feet at Cottage. M1 is 30 feet at Cottage. https://www.oregongeology.org/pubs/tim/p-TIM-Clat-08.htm

Bulletin of the Seismological Society of America, Vol. 103, No. 6, pp. 3205–3221, December 2013, doi: 10.1785/0120120105

Statistical Analyses of Great Earthquake Recurrence along the Cascadia Subduction Zone

by Ram Kulkarni, Ivan Wong, Judith Zachariasen, Chris Goldfinger, and Martin Lawrence

Abstract Goldfinger *et al.* (2012) interpreted a 10,000 year old sequence of deep sea turbidites at the Cascadia subduction zone (CSZ) as a record of clusters of plate-boundary great earthquakes separated by gaps of many hundreds of years. We performed statistical analyses on this inferred earthquake record to test the temporal clustering model and to calculate time-dependent recurrence intervals and probabilities. We used a Monte Carlo simulation to determine if the turbidite recurrence intervals follow an exponential distribution consistent with a Poisson (memoryless) process. The latter was rejected at a statistical significance level of 0.05. We performed a cluster analysis on 20 randomly simulated catalogs of 18 events (event T2 excluded), using ages with uncertainties from the turbidite dataset. Results indicate that 13 catalogs exhibit statistically significant clustering behavior, yielding a probability of clustering of 13/20 or 0.65. Most (70%) of the 20 catalogs contain two or three closed clusters (a sequence that contains the same or nearly the same number of events) and the current cluster T1–T5 appears consistently in all catalogs. Analysis of the 13 catalogs that manifest clustering indicates that the probability that at least one more event will occur in the current cluster is 0.82. Given that the current cluster may not be closed yet, the probabilities of an M 9 earthquake during the next 50 and 100 years were estimated to be 0.17 and 0.25, respectively. We also analyzed the sensitivity of results to including event T2, whose status as a full-length rupture event is in doubt. The inclusion of T2 did not change the probability of clustering behavior in the CSZ turbidite data, but did significantly reduce the probability that the current cluster would extend to one more event. Based on the statistical analysis, time-independent and time-dependent recurrence intervals were calculated.

Figure 3: Abstract from Kulkarni et al. (2013), who show that if mega-events are clustered and if the current cluster may not be closed yet, then the 50-year probability of another mega-event, to close the current cluster, is 17%. With Witter et al. (2013), this implies that the 50-year probability of a mega-event that floods the Pacific Way station is $21\% \times 17\% = 3.6\%$.

https://pubs.geoscienceworld.org/ssa/bssa/article-abstract/103/6/3205/331820/

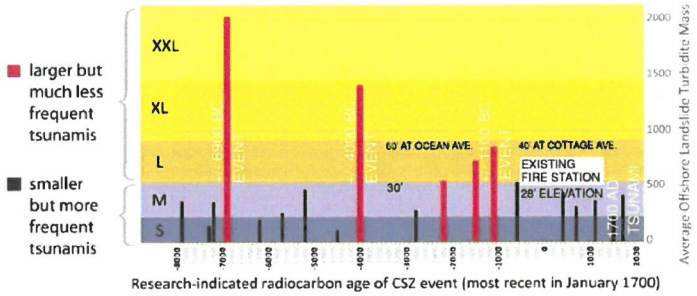

Figure 4: Timing, frequency, and magnitude of the last 19 great Cascadia Subduction Zone events over the past 10,000 years. Note the vast majority of events were too small to inundate the current location of the Pacific Way station, and all but one of the remainder are large enough to flood both the Park and Pacific Way stations. https://www.oregongeology.org/pubs/tim/p-TIM-Clat-08.htm

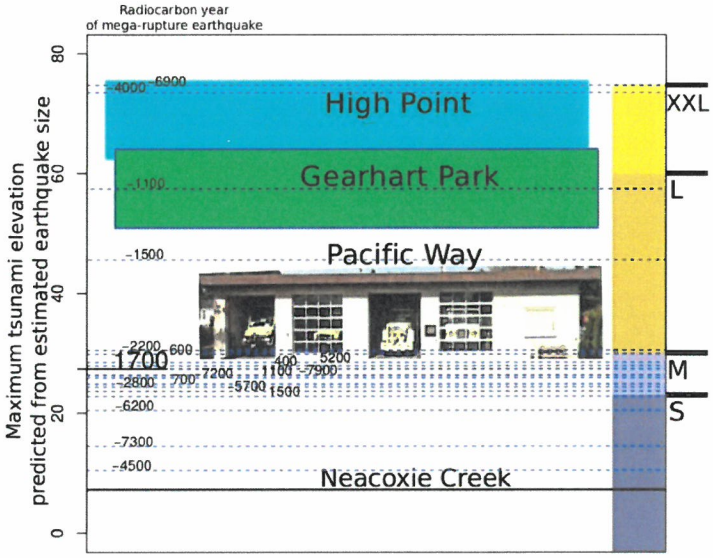

Figure 5: Plot of maximum elevation of ancient tsunamis on modern terrain in Gearhart, predicted from estimated earthquake size for all mega-events of the last 10,000 years. Source: DOGAMI Gearhart-Seaside Tsunami Inundation Map (Priest et al., 2013, Figures 3 and 6). Note: elevations of L and XXL are assumed at the dune front; at Cottage Avenue they are predicted to be 40 feet and 60+ feet per the DOGAMI Inundation Map (Figure 2). https://www.oregongeology.org/pubs/tim/p-TIM-Clat-08.htm

Figure 6: Gearhart tsunami inundation map showing L breaching Gearhart Park and crest of dune front at Ocean and Marion avenues, including the Gearhart Park site. LIDAR elevations of 62 feet are also noted within the L zone at the boundary with XL at Pacific Way and at 10th street, indicating the L1 scenario floods to 62 feet at the Park, which is 12 feet above the elevation of the proposed driveway of the Park station. Source: Priest et al. (2013). https://www.oregongeology.org/pubs/tim/p-TIM-Clat-08.htm
LIDAR GIS at 54.200.239.5.

The southern margin, however, appears to be unaffected by temporal clustering, with smaller earthquakes filling each gap between long ruptures with an event of limited strike length. Thus we suspect that the next event would most likely be in southern Cascadia. The general pattern of at least one smaller event between the larger events holds true for 17 of the 19 northern margin intervals, suggesting a 90-percent chance of the next event being a southern-margin earthquake.

Figure 7: https://pubs.er.usgs.gov/publication/pp1661F Page 133 of Goldfinger et al. (2011).

No.	Geographic area	C400 initial peak arrival time (h)	C400 initial peak arrival elev. (m)	C400 largest peak arrival time (h)	C400 largest peak arrival elev. (m)
56	Makah Tribe	1.43	0.3	4.15	1.6
57	Quileute Tribe	1.25	0.5	3.71	1.2
58	Quinault Tribe	1.22	0.4	5.78	1.5
5	Grays Harbor	1.19	0.7	5.84	1.6
7	Long Beach	1.01	0.6	3.54	2.5
9	Columbia River	0.90	0.3	4.97	1.3
11	Seaside	0.91	0.9	3.84	2.9
13	Cannon Beach	0.84	0.8	3.58	2.2
15	Manzanita	0.76	1.0	2.31	2.2
17	Rockaway	0.70	0.9	2.28	2.3
19	Tillamook Bay	0.76	0.5	2.26	1.2
21	Netarts Bay	0.68	1.3	2.25	2.6
23	Pacific City	0.56	1.2	2.84	2.6
25	Lincoln City	0.53	1.9	2.72	2.1
27	Depoe Bay	0.53	3.0	0.53	3.0
29	Newport	0.57	3.9	0.57	3.9
31	Waldport	0.66	7.4	0.66	7.4
33	Yachats	0.62	6.1	0.62	6.1
35	Florence	0.51	4.5	0.51	4.5
37	Winchester Bay	0.38	5.0	0.38	5.0
39	Coos Bay	0.34	5.8	0.34	5.8
41	Bandon	0.33	4.8	0.33	4.8
43	Cape Blanco	0.27	4.4	0.27	4.4
45	Port Orford	0.27	4.4	0.27	4.4

Figure 8: Predicted maximum height of tsunamis at the 10-m isobath from southern-margin earthquake event (Priest et al., 2014, p. 862). Note in the Seaside-Gearhart area a southern margin (partial rupture) event would produce a maximum tsunami height of 2.9 m or 9.5 feet. https://link.springer.com/article/10.1007/s11069-014-1041-7

Horning Geosciences

808 26th Avenue, Seaside, OR 97138
Ph./FAX: (503)738-3738
Email: horning@pacifier.com

April 22, 2019

Chad Sweet, City Administrator
City of Gearhart
PO Box 2510
Gearhart, OR 97138

RE: Siting the New Fire Station- Response to Recent Criticisms of Gearhart's Selection of the L-1 Tsunami Hazard Scenario

Dear Chad:

Important for choosing a design tsunami scenario for Gearhart is anticipating how high the tsunami flood waters will be. Multiple choices exist. They are based on extensive modeling by the State of Oregon as well as field investigations of tsunami sand deposits by university researchers.

The XXL-1 scenario, which totally floods all of Gearhart and Clatsop Plains, was not chosen, in part because of the futility of dealing with such a catastrophic scenario, but also because it has a very low probability of occurring (once every 10,000 years, or about once in 20 earthquakes).

With encouragement of the Department of Geology and Mineral Industries (DOGAMI), Gearhart has chosen the L-1 scenario. It encompasses 95 percent of the possible flood scenarios.

The M-1 scenario also was not chosen, because it encompasses only 79 percent of the modeled wave scenarios, and exposes the city to fatal consequences if a larger wave (the L-1) were to strike. Lives at risk are proportional to the numbers of buildings flooded for each scenario, shown in the following table.

Tsunami Scenario	Height at Beach	Height at City Hall*	Buildings Flooded
M-1	40 ft	30 ft	832
L-1	60 ft	40 ft	1406

- existing fire station floor is 28 ft

Although the M-1 scenario occurs most frequently in DOGAMI simulations, field studies by Curt Peterson (Emeritus Prof. PSU) demonstrate that tsunami waves have been as high as 50 ft in three of the past six quakes. Even higher waves are possible, since later, taller parts of a tsunami surge may not transport sand any farther inland and therefore may fail to leave evidence of their existence. Fifty-foot wave heights are in keeping with the L-1 scenario.

Peterson notes that tsunamis along the middle of the subduction zone (north Oregon coast) have been higher than those at the north and south ends of the subduction zone (Vancouver Island and north California). Thick sediment in the Columbia River submarine fan favors the development of splay faults in central Cascadia and explains why larger tsunamis occur in the vicinity of Clatsop County.

Critics have combined Peterson's wave heights for the last 3000 years from the ends of the subduction zone with those of the central part, making it appear that L-1 waves are extremely rare at Gearhart. This is inappropriate and could lead to choosing to prepare for smaller waves, when larger waves are more likely. Other representations of Peterson's data are not consistent with values tabulated in the article. Explanations have not been given for this discrepancy. Until this happens, it is concluded that the numbers have been changed by accident or not.

Goldfinger (2012) recognizes that earthquakes and tsunamis have occurred in clusters over the last 10,000 years and that we are still in a cluster, which has a mean recurrence period between tsunamis of 330 years. It has been 319 years since the last event in AD 1700. Further field work by Goldfinger (2016) has found that Cascadia tsunamis are more frequent than previously determined and revised the recurrence interval to 340 years, from 410 to 500. While it is not possible to predict when the next quake and tsunami will occur, the average period of time between events is rapidly approaching. It is prudent to make disaster preparations a high priority. Given the severe nature of the consequences, it is reasonable to assume the L-1 Scenario striking within 20 years.

Peterson recommends that "Coastal communities should plan for the maximum paleotsunami run-ups as recorded at the nearest reliable run-up localities." The nearest such site is Cannon Beach, where run-ups of 14 to 16 m (46 to 52 ft) have been determined. This is consistent with the middle of the L-1 wave height scenario. Preparing for this scenario is both reasonable and cautious. The community cannot afford to be wrong.

Thomas S. Horning, CEG E1131
Horning Geosciences

Expires: 7/1/19

References

Goldfinger, C., Nelson, H.C., Morey, A.E., Johnson, J.E., Patton, J.R., Karabanov, E., Guterrez-Pasto, J., Ericksson, A.T., Gracia, E., Dunhill, G., Enkin, R.J., Dallimore, A., and Vallier, T., 2012, Turbidite Event History- Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone; in Kayen, R., editor, Earthquake Hazards of the pacific Northwest Coastal and Marine Regions, USGS Professional Paper 1661-F, 184 p.

Goldfinger, C., Galer, S., Beeson, F., Hamilton, T., Black, B., Romsos, C., Patton, J., Nelson, C.H., Hausmann, R., and Morey, A.; 2016; The importance of site selection, sediment supply, and hydrodynamics: A case study of submarine paleoseismology on the northern Cascadia margin, Washington USA; Marine Geology, 36 p., in press.

Peterson, C.D., Carver, G.A., Clague, J.J., and Cruikshank, K.M., 2015, Maximum-recorded overland run-ups of major nearfield paleotsunamis during the past 3000 years along the Cascadia margin, USA, and Canada; Natural Hazards- Journal of the International Society for the Prevention and Mitigation of Natural Hazards; DOI 10.1007/s11069-015-1690-7; April 1, 2015; 22 p.

Priest, G.R., Goldfinger, C., Wang, K., Witter, R.C., Zhang, Y., and Baptista, A.M.; 2009; Tsunami Hazard Assessment of the Northern Oregon Coast: a multi-deterministic approach tested at Cannon Beach, Clatsop County, Oregon; Special Paper 41; State of Oregon Department of Geology and Mineral Industries; 81 pages, plus appendices.

Priest, G.R., Stimely, L.L., Madin, I.P., and Watzig, R.J, 2015, Local Tsunami Evacuation Analysis of Seasdie and Gearhart, Clatsop County, Oregon; Open File Report O-15-02; Oregon Department of Geology and Mineral Industries; 36 p.

Tsunami Inundation Map, Clat 08, (2013); Tsunami Inundation Maps for Seaside and Gearhart, Plate 1.

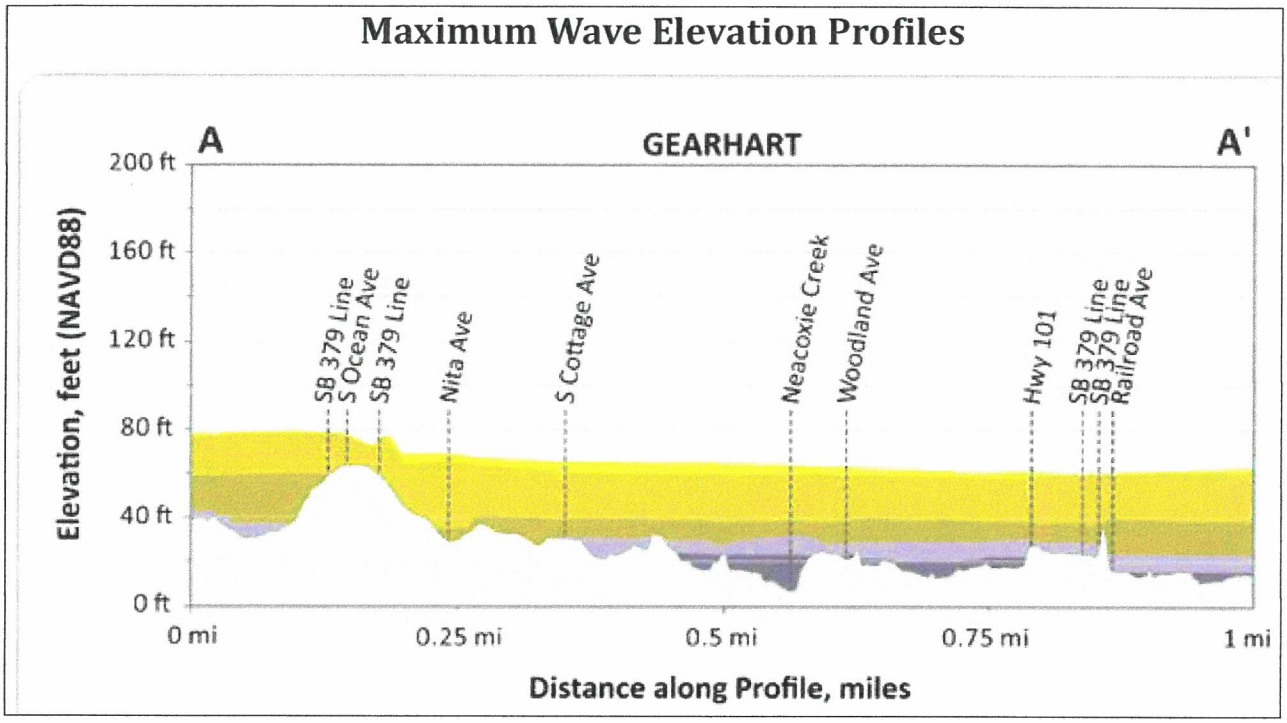

Figure 1: Modeled tsunami inundation of Gearhart, as shown for a profile that runs east-west at E Street. Wave run-up scenarios are color-coded. Dark purple- Small. Light purple- Medium. Dark mustard yellow- Large. Medium yellow- Extra-Large. Light canary yellow- Extra-Extra Large. Note that the Large Scenario (L-1) is approximately 60 ft high on the west side of the western dune ridge, but is only about 40 ft high at Cottage Avenue. Water depth at the present fire station is about 10 ft. From the Tsunami Inundation Map Seaside-Gearhart (2013).

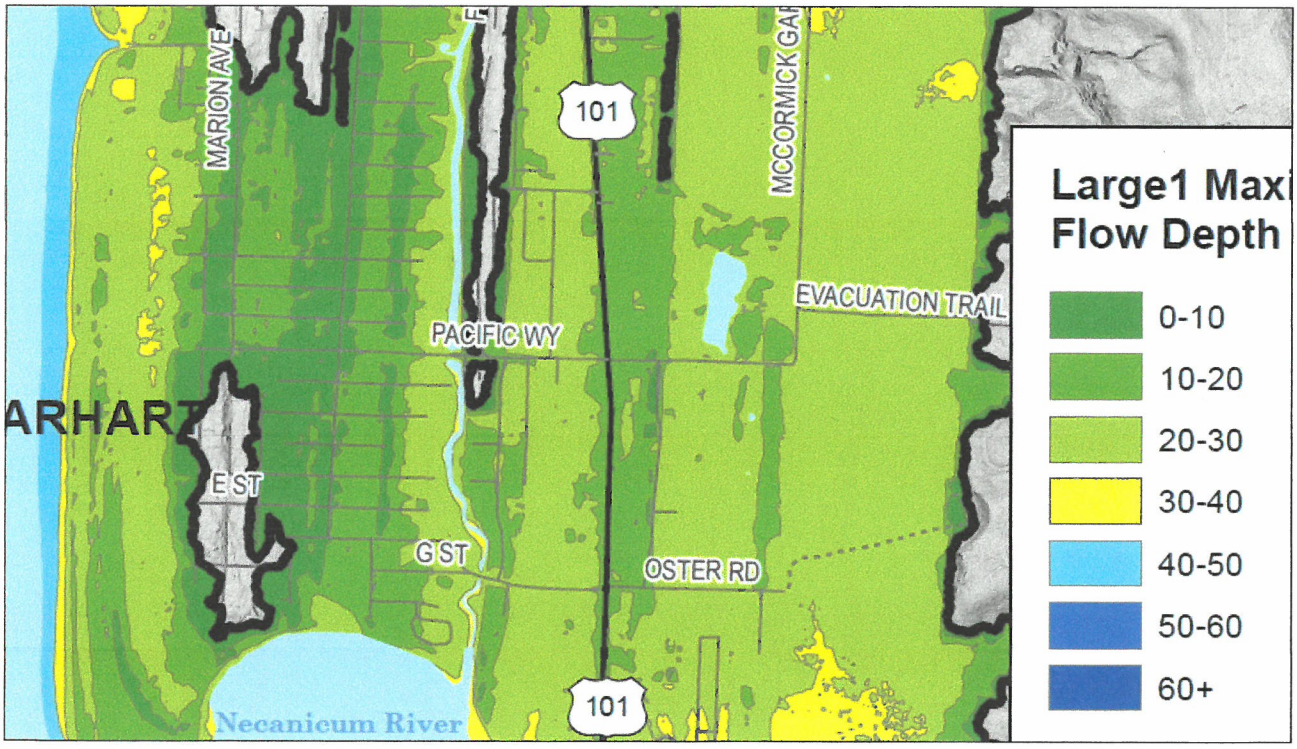

Figure 2: Water flow depth for L-1 Scenario; water depth at present fire station site is about 10 to 15 ft deep; after Priest and others (2015).

	Entire Map Area	City of Gearhart	City of Seaside	Unincorporated Areas
Total Buildings	6,620	1,729	4,611	280
Buildings within Tsunami Zones*				
Small	3,885	310	3,573	2
Medium	5,006	832	4,127	47
Large	5,759	1,406	4,225	128
Extra Large	6,227	1,729	4,343	155
Extra Extra Large	6,287	1,729	4,350	208
Percent of Buildings within Tsunami Zones				
Small	58.7%	17.9%	77.5%	0.7%
Medium	75.6%	48.1%	89.5%	16.8%
Large	87.0%	81.3%	91.6%	45.7%
Extra Large	94.1%	100.0%	94.2%	55.4%
Extra Extra Large	95.0%	100.0%	94.3%	74.3%

Figure 3: Buildings expected to be flooded and/or washed away from tsunamis of various sizes. For the L-1 Scenario, 81 percent of the buildings in Gearhart would be flooded; after the Tsunami Inundation Map Seaside-Gearhart (2013).

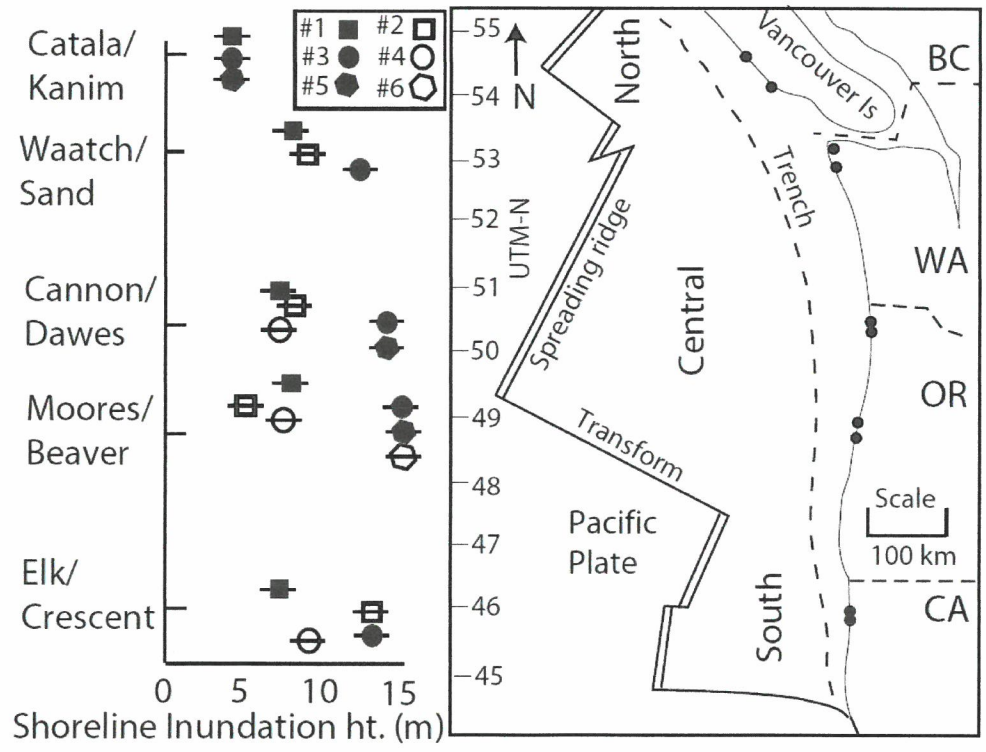

Fig. 6 Estimated shoreline inundation heights (±2 m NAVD88) for major nearfield paleotsunamis along the Cascadia margin over the past 3000 years. Ages of Cascadia rupture events and associated nearfield paleotsunamis are as follows: #1–0.3 ka; #2–1.1 ka; #3–1.3 ka; #4–1.7 ka; #5–2.6 ka; #6–2.8 ka (Tables 1, 2)

Figure 4: Heights for Cascadia tsunamis for the past 3000 years; after Peterson and others (2015). Note that tsunamis for the Cannon Beach area are as high as 14 to 15 meters (as high as 52 ft) for 50 percent of the time.

Figure 4: Tsunami for the L-1 Scenario is modeled to flood to 40 to 42 ft, or to about the roof of the existing fire station. For the M-1 Scenario, water would flood to about 30 ft, or barely into the station. There is some variation in the water height here, because one source of information (TIM Clat 08) is for flooding at E Street, and another shows water depth for this site as greater than 10 ft and less than 20 ft (Priest and others (2015).

Gmail by Google

Chad Sweet <chadsweet@cityofgearhart.com>

Letter for inclusion in May 2019 City Council packet

1 message

Bonnie Delaney <bludelaney@hotmail.com> Thu, Apr 25, 2019 at 1:19 PM
To: "mayorbrown@cityofgearhart.com" <mayorbrown@cityofgearhart.com>, Chad Sweet <citymgr@ci.gearhart.or.us>
Cc: "gailcomo@cityofgearhart.com" <gailcomo@cityofgearhart.com>

I submit this correspondence for the record, to be included in the City Council packet prepared for the May, 2019 Gearhart City Council Meeting.

April 24, 2019

To Mayor Matt Brown and Gearhart City Counselors:

As a member of the Sand Dune Vegetation Committee, I was pleased to see a letter and staff report provided by Denise E. Lofman, Director, Columbia River Estuary Taskforce (CREST), in the April 2019 City Council packet. This communication confirms the benefits of leaving properly mulched landscape debris in place.

While the Dune Committee did propose removal of dead wood and trimmings so this material would not add to the already troubling fire fuel load in the dunes, we *did not discuss* mulching the woody debris. This was clearly an oversight and should not be used as an excuse to complicate the work and add to the expense of all those working to comply in good faith with the new ordinance.

As the CREST report confirms, woody mulch can help:

- retain soil moisture
- control weed regeneration
- control soil temperature
- assist with disease control

Abatement of State-identified noxious weeds will be an on-going challenge. Stewards of the land can use all the help they can get. Private donors and City budget planners should not be forced to divert funds to unnecessary removal tasks.

In addition to the benefits noted by CREST, allowing in-place mulching should also reduce the amount of vehicular traffic needed for debris removal. Limiting vehicles in the dunes was a topic addressed with enthusiasm by a number of Dune Committee members. They should be pleased to note per the CREST report that spreading mulched debris has many benefits and no discernible harms.

With this in mind, Section 5 of the Pruning, Trimming and Removal of Vegetation and Trees guidelines found under the Documents, Reports, and Presentations tab on the City website can easily be interpreted to allow mulching and spreading as an accepted way to "properly remove" debris from the dunes. No change to the code is necessary.

I look forward to the publication of the "Best Practices" pamphlet Counselor Smith and the committee suggested be made available to home owners and contractors seeking to do permitted

work in the dunes. Proper mulching and spreading techniques should be included in this document.

Sincerely,

Jack Delaney
PO Box 2187, Gearhart, OR 97138
Surfside Condominium #217

Gmail by Google

Krysti Ficker <krysti@cityofgearhart.com>

Fwd: Pickleball correspondence

1 message

Chad Sweet <snkdad@gmail.com> Sun, Apr 28, 2019 at 9:09 AM
To: Krysti Ficker <krysti@cityofgearhart.com>

---------- Forwarded message ---------
From:**Randy Frank** <randdfrank@outlook.com>
Date: Sun, Apr 28, 2019, 7:19 AM
Subject: RE: Pickleball
To: Chad Sweet <snkdad@gmail.com>, chadsweet@cityofgearhart.com <chadsweet@cityofgearhart.com>

OK thanks for the email update and yes please add this to council correspondence and if it helps I grew up in Gearhart and attended 6th grade there! Back in the days of the chain link " nets " we would organize work days to clean the courts in the spring as the pine needles would accumulate on the courts, especially the west side. We once removed 22 wheelbarrow loads off the courts and would relocate them to the east side slope of the property. There was a problem with puddling which would require at least one of the players to show 45 min early to squeegee the water off the playing surface so it could dry before play. We were also rather excited when the Basketball courts were removed from inside the courts and relocated outside on the south side adjacent to the back board wall, not to mention when the city replaced the metal nets with REAL ones. We currently have people from Astoria, Seaside, Arch Cape, Tolovana Park and Gearhart who enjoy these courts and were extremely pleased when they were rebuilt over the water tank. These courts are uniquely part of the history of Gearhart and we would hate to see them repurposed. I am sure it's still true that your lodging properties advertise the fact that your park has tennis courts and we encounter many of those people using the courts, many of which come down and utilize the courts multiple times per year.

Please note also that the use of the hard whiffle style balls used in Pickleball cause the surface to wear significantly faster than with the fuzzy tennis ball.

Randy Frank

From: Chad Sweet <snkdad@gmail.com>
Sent: Wednesday, April 24, 2019 10:46 AM
To: Randy Frank <randdfrank@outlook.com>
Subject: Re: Pickleball

Thanks for reaching out. Would you like me to add this email to the council's correspondence?

Also, the best email for me is chadsweet@cityofgearhart.com as I don't check my personal email very often.

Chad

On Mon, Apr 22, 2019 at 4:49 PM Randy Frank <randdfrank@outlook.com> wrote:

> Hello Chad I hope things are well with you. This will rank down at the bottom of your important list…
>
> I have been approached by a few different people since I returned from the desert (where I played a lot of pickleball) to see if I would join in a petition to convert one of the beautiful Gearhart tennis courts to pickleball courts. While I am in favor of having pickleball courts I am NOT in favor of doing it at the expense of existing tennis courts. I have already begun " floating " the idea of building pickleball courts in Seaside as we will need to relocate the two courts at the H.S.

which are now next to 101. We have a couple of options as to where but of course that is down the road a bit but I just wanted to let you know my personal thoughts regarding this latest movement.

Thanks,

Randy Frank