APPARENT PREFERENCES OF BEACH USERS AT VIRGINIA BEACH RESORT ZONE

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ABSTRACT

After compiling an appropriate list of beach criteria from established award programs and experts, the research landscape architect observed the Virginia Beach Resort Zone for areas of intense beach user activity. The resulting analysis of these "hot-spots" indicated that urban resort beach users visiting the recreational beach during high-use times tended to gravitate toward locations on the resort beach which were close to three needs: public parking, public restrooms, and inexpensive refreshments. This pattern shows the apparent preferences of many beach users for certain amenities.

Dedication: Thank the LORD for life and health to complete the research. Thank you, Ken and Andrea, for your support throughout the process.

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INTRODUCTION

Urban resort beach zones, like the Virginia Beach Resort, are dynamic landscapes with large numbers of people potentially-affected by design choices at such locales. An understanding of this landscape may help lead to more effective design for the urban resort beach, generally.

Some coastal managers have suggested there may be potential to preserve our most fragile coastal resources by making sure intentionally-hardened beaches meet the needs of the masses (Roig, 2005). This process of hardening simply relates to the provision of design, planning and engineering interventions on the landscape that increase its resiliency for the intended use. In better-serving the many people who seek traditional "sun, sand and surf" vacation experiences, hardened sites may ensure that more remote, pristine areas remain less-used (effectively, protected).

The question asked in the current research was, "Why are there clusters of human occupation in the patterns seen as 'hot spots' at resort beaches like Virginia Beach Resort Zone?" Hot-spots, or areas of high-density occupation by beach users, were thought to be clues to revealing criteria that might cause people to cluster. In other words, what factors influenced people to move into certain locations, favoring those places over other, equally-available locations during a "typical" high-visitation day?

If a research Landscape Architect can ascertain which criteria are most desirable for people visiting these type places, then others planning or managing similar urban beaches will have the advantage of knowing which attributes are favored during visits. What, exactly, has been considered desirable at a popular resort beach, like Virginia Beach Resort Zone? In understanding what criteria create "hot-spots," the researcher may possibly reveal critical landscape features that strengthen the value of hardened urban beaches. How have researchers in other professions answered similar coastal space planning questions?

REVIEW OF LITERATURE

In the research of beaches, the use of visitor surveys has been very popular. Research in 2009 (Roca et.al.) surveyed beach users in Spain, and revealed, in part, that people at recreational beaches tend to be very positive about their experiences, sometimes giving survey responses that reflect a high degree of satisfaction with their environment. Another study (Bujosa, et. al., 2011) gathered feedback from beach visitors concerning their choice of site by conducting "intercept surveys." However, the researchers examined where users

actually were, as well as the survey respondents' stated preferences, to reveal inconsistencies in responses and actual behavior.

Recognition of the fact that people have preferences, when asked, that may differ from their actual behavior agrees with this current research effort to simply observe where people situated themselves on a popular resort beach. Rather than conduct a survey with questions for beach users, this landscape architecture research relies on actual human behavior at a resort beach. By looking for crowds of beach users, one might reasonably conclude that some tangible factors were present in those "hot-spot" areas that were not found elsewhere.

This research approach has historical merit for landscape study in urban settings: simple, direct observation, similar to William Whyte's now-famous study of "places to sit." Whyte (1980) researched the patterns of city office workers as they occupied urban plazas. The simplicity of his technique was that he looked for patterns of people, and made note of environmental factors present in the urban design that might have influenced the pattern. Landscape architects consider environmental elements, or tangible factors, as potential influencers for human behavior.

Tangible factors have been highlighted in several beach rating schemes and award programs over the last twenty years or so. However, in a pilot study in 1999, Morgan criticized all existing beach rating lists as limited, in terms of beach aspects considered. Therefore, it made sense for the current research, from a generalist perspective of landscape architecture, to consider as broad a range of criteria as possible.

In order to establish possible factors that might affect location choice by beach users, the landscape architecture researcher examined all criteria that have been considered desirable for beach users by coastal experts from several organizations. A wide range of factors has been considered important by groups like the Blue Wave Campaign, and others. Each group has a goal for their scheme, ranging from cleaner beaches to ecological awareness; while one coastal expert encouraged interest in tourism travel to beaches by giving "ratings" for beaches (Leatherman, 1997).

By surveying some 650 beaches in the United States, between 1989 and 1991, Leatherman (1997) developed a battery of fifty factors to allow quantitative comparison of the various beaches, attempting to design an objective rating system that would facilitate appraisal of the nation's recreational beaches. In order to be relevant, Leatherman considered criteria in his list that influenced beach quality, broadly. As evidence of the applicability of his system, he presented profiles of the best and worst beaches in the US, showing how high

rating scores on his criteria list corresponded to a top-ranking beach, and low scores corresponded to one of the lowest-ranking.

One of the most comprehensive reviews of beach criteria was research conducted by Cagilaba and Rennie, in 2005. A total of seventeen campaigns, award programs and checklists were examined by their research team, along with beach guides, etc. All of these differing parties had developed their own particular scheme over the years, to "grade" beaches based on criteria unique to their individual vision of what constituted a "good beach." In that research, a side-by-side analysis revealed many similarities and some differences.

RESULTS

The criteria lists that were used as the foundation for the current research are given in the Appendix; these beach experts and coastal management organizations were deemed reliable, objective sources of desirable beach criteria. Because they had overlapping and redundant criteria, it was decided by this researcher, that it would be best to compile the lists into one comprehensive score card in order to give the most complete picture of the beach.

The resulting "Beach Score Card" was an intuitive re-structuring of standards already established, using the generalist status of landscape architecture; criteria were considered from an inclusive perspective, and organized into similar topics. One 45-criteria instrument, with nine distinct pages of categories was developed. This arrangement of similar criteria on single sheets, with space on each sheet for comments, gave this landscape architecture researcher the opportunity to consider each criterion, but allowed for ease of grading similar criteria. For instance, on the "access" page, all landscape architecture considerations regarding access to the recreational beach were placed on the same sheet, from parking availability to walkways to competition with other beach users.

Where similarly-phrased criteria were noted from list to list, only one statement was included on the compiled score card. When intent or overall factor was significantly-distinct, it was weighed for applicability to the landscape of the resort beach in question. Criteria that were deemed inappropriate for an urban resort beach were excluded from the final beach score card. Most of the criteria were worded as close as possible to the original.

METHODS

Since the most direct approach for analysis of a beach location was determined to be a simple observation of where beach users were gathering, literally, the "vote made by one's feet," the criteria receiving the "most votes" were those revealed by user density on a typical high-visitation day. Relative density was determined by applying a "view-finder" approach to estimate where the greatest number of users was observed within a standardized field of vision from a common observation-point.

In order to ensure that other factors were not affecting use patterns, the researcher chose a timeframe with typical weather conditions (i.e. extreme weather was not threatening), no special tournaments or concerts, and when other normal conditions of human activity were in play (i.e. political climate). During a site visit in early August, the height of the popular summer beach visitation season for Virginia Beach, in 2010, the zones of most intense daytime human activity and occupancy ("hot-spots") were found to be at or near the following four street entrances: 30^{th}, 27^{th}, 24^{th} and 19^{th}. Use of the "view-finder" was as follows: from the vantage-point of the boardwalk, observation toward the ocean, across the sandy beach was accomplished with a small hand scope, to quickly include or exclude locations for analysis as the observation-point revealed more or fewer people within the field of view.

On the first day of the visit, weather became too cool and rainy early in the day, for most beach users to flock to the resort beach zone in large numbers. Most of the pedestrians on this day seemed to be on their way to souvenir shops, restaurants and "fun houses" located a block in-land, on Atlantic Avenue. Although these "accessory" attractions were recognized as part of the success of Virginia Beach to retain visitors during inclement weather, they were not considered critical to "typical day" clustering in beach "hot-spots."

Day two, the weather was warm and sunny. After arriving near the northern end of the resort zone, the researcher noted very few beach users north of the King Neptune statue. By walking south, the researcher observed beach users, and made entries on several copies of the compiled beach score cards along the way. Once at Rudee Inlet, the southern-most end of the Resort Zone, the researcher returned to the point of entry, re-examining criteria at key points of crowd concentration.

On day three, the researcher verified the general location of "hot spots" by quickly scanning the resort zone again. Areas with the largest crowds of beach users were established on days two and three: typical summer days with warm temperatures, abundant sunshine and no special daytime events that would encourage crowds to gather, like music concerts.

The filled-in score cards from the observation days were further supplemented by additional research afterward to complete parts of the score cards that could not be ascertained by on-location observations. For instance, information about water quality was obtained from the Environmental Protection Agency, but was not readily-available from sources at the resort beach during the visit.

DISCUSSION

In this study, there were several obvious factors: many people were here because it is a free public beach in close proximity to an urban center; there was ease of movement in and out; and many people enjoy "the out-of-doors." What was not so obvious, at first glance, was *why* people were moving to certain places within this large expanse that seemed to be fairly uniform?

Potential opportunity to place one's beach towel or chair was almost unlimited. Yes, there were some predictable "clusters" of hotel patrons in front of "their" accommodations ocean-side. But, the remaining beach visitors most likely had actual reasons for their behavior once factors contained in the "hot-spot" locations of beach user activity were analyzed using the compiled score cards.

Comparison of the score cards was accomplished over a period of time, as information was collected. After all criteria had been "graded," the three-mile-long resort beach zone was analyzed for similarities and differences along its linear context. Criteria that were "all the same" were considered non-selective in determining a "hot-spot;" criteria that varied were suspected of contributing to favoring or avoidance of certain areas. Some attributes in the beach environment directed people away from areas, like the giant inflatable hippo slide present during this researcher's visit, which effectively blocked the view, as it occupied a major portion of the beach. Except for visitors interested in paying for this "diversion," the area near it was sparsely-occupied (beach users kept moving past this location).

The criteria that were equally-present (clearly the same for the entire 3-mile zone) during this study included: sand quality, width of beach, ease of access, lifeguard presence, general safety, cleanliness, freedom from pests, and proximity to rinse-off stations. While it seemed apparent that these elements were likely appreciated by beach visitors, they did not help reveal why a "hot-spot" had developed.

After analysis of the "Beach Score Cards," the criteria that that coincided with "hot-spot" location were identified as access to three needs: long-term public parking, traditional plumbed public restrooms and amenities that provided

inexpensive refreshments. Where these three criteria overlapped in the beach landscape, there were the largest crowds of beach visitors, or "hot-spots." Please refer to the map prepared by the author, "Virginia Beach Resort Zone Map of 'Hot Spot' Context," on page 17.

On the following pages (pp.7-15), the completed beach score cards have been summarized for the four identified "hot-spots." In order to easily see which criteria would have earned Virginia Beach Resort Zone high marks in the rating schemes, the criteria considered "positive" observed conditions by the original awarding organizations have been highlighted in green.

BEACH SCORE CARD

ACCESS
Location of Hot-spots: 30th 27th 24th 19th Streets

1. Easy, safe beach **access** provided for all, including the disabled where possible.

Adequate Basically the same for the entire resort zone; steps and ramps at each block, with wooden walkways (walk-overs) at several entry points, across the sand. Mobile vendor beach wheelchair rental.

Safe Yes; plus, grade-level access from some hotel rooms; i.e. at 28th St.

2. Adequate access and **parking** facilities, with suitable access for disabled people where possible. Where parking on the beach is allowed, the area should be safe and clearly marked and defined. (not permitted at this resort beach)

Adequate Somewhat inadequate for peak daytime use; at 24th St. metered parking was 3 blocks away (hotel patron only, otherwise).

Safe Street-side parking somewhat dangerous; at 19th St., parking lot is two blocks inland.

3. **Well-kept grounds**/promenades or natural environment. Benches, walkways and lighting are well-maintained, and in-keeping with overall "feel" of beach.

Well-kept grounds Plazas/lawns popular; variable beach frontage well-kept.

Well-kept promenades Walkways heavily-used; bedding mulch walked-over at 28th St.

	benches	**walkways**	**lighting**
Maintenance	good	good	good
In-keeping	good	good themed	good

4. **Competition** from non-swimming beach-goers, like fishermen, boaters, is rare.

Fishermen restricted to pier only. Cigarette smoking is not prohibited. Tour boats stay safely away from shore. Corps of Engineers maintenance vessel approached shore close enough to startle some visitors near pier.

CLEANLINESS

5. **Trash**, litter and glass at beginning of day = none.

Margins very little

Beach none; some litter beneath pier mid-afternoon

Water none

6. Water is **clear** (not turbid), with slight aquablue color.

Somewhat turbid from intense wave action. Mostly slight aquablue color, except at 24th St. where there was slight lime green shift.

7. **Water quality** meets or exceeds EPA standard for bathing; easily-recognizable system of communicating "safe water quality."

Meets EPA standard Yes

Communication system No; difficult to locate knowledgeable persons; quite difficult to negotiate to proper website.

8. The beach has in place a system for prompt **public warning** if the certified beach has, or is expected to, become grossly polluted or unsafe.

Red flags were flying to indicate dangerous wave/current conditions.

9. **Smell** is that of fresh, salty air; not dead fish, etc.

Good, except slight "fishy" smell downwind of pier (24th St.).

10. **No algae** or other **vegetation** materials accumulating and decaying on the beach.

Not observed, except near and downwind of pier, where a small amount of seaweed appeared on sand near breaker zone.

11. **No** evidence of accumulation of jellyfish or other **decaying animal life**.

Not observed.

SAND

12. Beach material is fine, soft **sand**, on exposed beach and bottom of bathing area.

Exposed beach Nourished/renourished materials include some very fine particles which become airborne when dry & windy. Entire length of resort beach zone is groomed daily during summer season.

Bottom of bathing area Similar material.

13. Beach **width** at low tide is at least 200 feet.

Excellent width.

14. Color of sand: gray, black, brown, light tan, white/pink

15. Beach **condition**: erosional, stable, or depositional

16. Gently-sloping **bottom** underwater in swimming area.

Somewhat.

17. No tar balls or evidence of **oil** in the water or on the beach.

None observed.

SAFETY

18. **Lifeguard**s or first aid officers on duty during the high-use season, with adequate safety provisions readily available for emergency use.

Lifeguards Yes; well-staffed, abundant and standardized stations, entire zone.

Emergency safety provisions None observed, no signage, assume lifeguard-provided.

19. **Record** of beach **closures**, annually (sliding scale: 0 is best, 6+ is worst).

Record showed no closures due to unsafe water quality this year; but red flags warned of rip current/dangerous surf both days.

20. **Safety** record (deaths): some none

Record shows from1998-2008, 22 deaths by drowning at resort beach area.

21. **Public safety** (pickpockets, crime, etc.): common rare

Website indicates seasonal rise in crime, including theft during high-use. Police presence was visible; resort beach did not "feel" crime-ridden.

22. Local ordinances affecting **animals'** beach access should be clearly displayed and enforced; if animals are allowed, clean-up requirement posted/enforced.

Displayed Yes

Enforced Few dogs observed, no clean-up issues; assume rules are enforced.

COMMUNICATION

23. Laws covering beach use and appropriate **codes of conduct** shall be easily available to the public (including in local tourism centers and civic offices).

Posted at lifeguard stations and entry points to beach; provided in SOME brochures. Website included some regulations. Sign missing at 28th Street.

24. **Map** of area, showing "you are here" along with restrooms, showers and refreshments/concessions, as provided. Parking areas, limits of "safe swimming" and lifeguard stations, as well as first-aid/emergency assistance.

Map No posted sign maps; plentiful hand-held maps widely available.

"You are here" Entry/exit points included block number facing both directions.

Restrooms On some maps (brochures and website).

Showers Not on maps; but were regularly available on boardwalk.

Refreshments/concessions On some maps/brochures/websites.

Parking On most handheld maps & visitor guides, as well as websites.

Safe swimming zone Lifeguarded area defined only.

Lifeguard station "from Rudee Inlet to 41st Street"

First aid/emergency assistance Not specifically referenced; assumed to be available at lifeguard stations.

25. **Signage** or markers to indicate directions to restrooms, emergency help.

Not adequate for restrooms; emergency help is assumed to be lifeguard.

AMENITIES

26. Some **amenities**, like snack bars, chairs, etc. available.

Plenty of restaurants, concessions; plentiful rental opportunities for chairs, umbrellas, etc. Kid's beach playground at two of the "hot-spot" sites.
At 31st Street, there was a McDonald's two blocks inland.
At 27th Street, there was a DQ; two blocks away, 7-11 is heavily-used.
At 24th St., another 7-11 is two blocks away; Walgreens, one block.
At 18th St., Subway & ice cream parlor one block inland.

27. The beach should have either appropriate **litter bins** in adequate numbers, properly secured, regularly maintained and emptied at least daily; or an effective carry-in/carry-out program in place.

Adequate litter bins Yes

Properly secured None with lids; but secure.

Maintained Yes

Emptied as often as necessary Yes

Recycling bins Not generous, but available at in/out access points.

28. Adequate, clean **toilet** facilities within walking distance, including facilities for disabled people.

Adequate Not adequate for very large crowds; adequate for moderate crowds.

Portable toilets only from 17th St. & below.

Clean Not completely clean when very busy; clean during moderate activity.

29. **Shower** facilities available; clean and well-maintained. Persons with disabilities?

Rinse-off stations on boardwalk. Very little privacy for persons needing closer attention.

Clean Yes, some rinse-off stations on boardwalk had sand accumulation.

Well-maintained Yes, some sticky, messy areas in rinse-off spray zone; poor drainage around some stations.

NATURAL ENVIRONMENT CONSERVATION

30. **Vegetation** nearby: trees, sand dunes. Native, non-invasive, preferably.

Managed landscape for the entire resort zone. No sand dunes, little native vegetation.

Ornamental species abundant; some use of "palm" trees is in discord with city planning recommendations.

Artificial palm trees present at ADA-designed Grommet Island.

31. The beach should provide evidence of local **conservation educational materials** and programs for the public. There should be at least one well-defined initiative related to the environmental, health or safety management of the beach.

Materials Not much of this information included in brochures.

Programs Announcement on one sign at point of entry.

One relates to environmental, health or safety management of beach

Announcement was about environmental program.

32. The beach has an ongoing program to evaluate techniques and implement **sustainable approaches** to beach enhancement and nourishment (e.g., vegetation, dune retention and sediment delivery).

25th St: Corps of Engineers sign explains beach nourishment program.

SWIMMING APPEAL

33. No evidence of **sewage** outfall on beach; no "foam" in water.

Evidence on beach None detected.

Evidence in water None detected.

34. Water temperature: hot/cold or warm

Pool-like temperatures ranged from 72 to 77 degrees F.

35. Air temperature, midday: below 60/above 100 or 80-90

Cooler one day: 69 to 83 degrees F.

36. Wind speeds: high low Some variability through day.

Both days included fairly high wind speeds: red flags resulted.

37. Size of **breaking** waves: high/dangerous low/safe

Both days included fairly high breaking waves.

38. Longshore current: strong x weak

Moderately strong longshore current both days.

39. Rip currents: often x never

Rip currents are frequent problems; warnings both days.

40. Tidal range: large (4+m), 3-4m, 2-3m, 1-2m, less than 1m

MISCELLANEOUS

41. Pests (biting flies, tick, mosquitoes): common no problem

A few red ants on boardwalk near benches and trash cans.

42. Misfits (i.e. nuclear power station; offshore dumping): present none

Military bases nearby result in frequent fighter-jet "fly-overs" and various battleships on the horizon. Almost continuous presence of freight ships on the horizon, due to busy ports nearby.

43. Views of **near environment** are clear, unobstructed; not cluttered.

Clear view from entry point out across beach, and up and down boardwalk.

44. Distant **vistas** to ocean unconfined.

Vistas out across ocean unconfined, except for water traffic.

Fishing pier blocks part of view. Inflatable slide --"Hippo" blocks part of view.

45. Noise from traffic, crowds, etc. is "little."

Traffic Tourist boats added a little noise. Military jets were very loud, but "roars" came in brief bursts.

Crowds "Little" -- Peaceful, quiet – not loud. Mostly happy sounds. Occasional whistle from lifeguard to caution swimmers, etc.

CONCLUSIONS

Bottom Line: When assessing beaches, a useful approach for landscape professionals would be to compile lists of criteria, similar to the process used for this research, because this tool at Virginia Beach Resort Zone quickly revealed the most probable causes for the patterns of occupancy seen during typical summer beach day use.

Why it matters: Landscape architects should be able to ascertain the valuable attributes of places to be planned-for. In an urban recreational beach, with easy access to many people, provision of the "product" sought by a large percentage of beach users, a thoughtfully-designed beach like the resort zone may help preserve more pristine areas from overuse.

Nelson, et. al. (2000) caution the use of award scores as the basis to "improve" beaches by additional facility development, as the scenery aspect may be negatively impacted by such infrastructure. Because some coastal managers have placed a great deal of confidence in award systems, it is possible that the general public may not have been well-served. In some cases, implementation of improvements, spurred by managers' interest in bettering the score of "their" beaches may have actually caused a decline in that very resource, from the perspective of actual beach users.

> "It is intellectual arrogance for management to infer that they know what the beach user desires. Any development proposals in terms of improvement to existing amenities or provision of additional facilities at beaches, whether or not these are intended to enable qualification for beach awards, should demand careful consideration of possible impacts on the beach features which currently seem to attract visitors to these sites." -Nelson, et.al., 2000, p. 97

VIRGINIA BEACH RESORT ZONE MAP OF *"HOT SPOT"* CONTEXT

APPENDIX

STANDARDS

Management Practices & Criteria- 2002/2003 **Blue Wave Campaign** (downloaded from web)

RESORT BEACHES

A resort beach is one that has developed its facilities, actively encourages visitors and provides varied recreational opportunities. The beach should be within easy access to commercial development. It would typically include hotels, resorts, restaurants, shops, toilets, public transportation, municipal supervision, first aid facilities, and public phones. Below are the 22 criteria for resort beaches applying for 2002/03 Blue Wave certification.

1. A beach shall use the following EPA recommended water quality guidelines (or "as protective" as EPA guidelines), during the 2002/03 high-use season:

Bacteriological Indicators'	Recommended Guideline*
Enterococci (marine)	
Escherichia coli (fresh water)	1986 EPA Ambient
*as defined by EPA	Water Quality Criteria for Bacteria*

2. There should be at least 5 samples taken over 30-day intervals with equal spacing throughout the high-use season or as long as the Blue Wave flag is flown.

3. Industrial or municipal discharges in compliance with appropriate standards, causing minimal adverse effects on environment, human health or aesthetics.

4. No algae or other vegetation materials accumulating and decaying on the beach.

5. Lifeguards or first aid officers on duty during the high-use season, with adequate safety provisions readily available for emergency use.

6. Records of all emergency incidents should be kept (i.e., saves, fatalities) during the certification season. These records, as well as local emergency plans to cope with pollution incidents, should be available for public inspection upon request, if applicable.

7. Construction work or hazardous derelict structures should be marked or enclosed to prevent ready access by the public, particularly small children.

8. Easy, safe beach access provided for all, including the disabled where possible.

9. Prohibition of unauthorized driving, dumping and camping.

10. Local ordinances affecting animals' beach access should be clearly displayed and enforced.

11. Clearly marked and protected sources of drinking water for public use within walking distance.

12. Working public telephones within walking distance from the beach.

13. Adequate, clean toilet facilities within walking distance, including facilities for disabled people.

14. Adequate access and parking facilities, with suitable access for disabled people where possible. Where parking on the beach is allowed, the area should be safe and clearly marked and defined.

15. The beach should have either appropriate litter bins in adequate numbers, properly secured, regularly maintained and emptied at least daily; or an effective carry-in/carry-out program in place.

16. The beach shall promote peaceful and protective coexistence of sensitive plant/wildlife habitats with recreation (e.g., turtle nesting, zoning for swimmers, surfers, and motorized craft).

17. The beach has evidence that protected sites and rare or protected species have been addressed in partnership with local fish and wildlife services and conservation groups.

18. The beach has in place a system for prompt public warning if the certified beach has, or is expected to, become grossly polluted or unsafe.

19. Laws covering beach use and appropriate codes of conduct shall be easily available to the public (including in local tourism centers and civic offices).

20. The beach should provide an easily identified information point with advice about the nearness of the following public facilities:

- hospital/first aid point
- police
- coast guard
- local authority contact number and address

21. The beach should provide evidence of local conservation educational materials and programs for the public. There should be at least one well-defined initiative related to the environmental, health or safety management of the beach.

22. The beach has an ongoing program to evaluate techniques and implement sustainable approaches to beach enhancement and nourishment (e.g., vegetation, dune retention and sediment delivery).

National Healthy Beaches Campaign (NHBC) Certification reflects a demonstrated commitment to promoting the awareness of environmental and safety issues facing all beaches, while presenting your beach as a desirable travel destination. NHBC is **not** associated with the annual list of America's best beaches, issued by Dr. Stephen P. Leatherman ("Dr. Beach") and membership in NHBC does not serve as criteria for or influence such selections.

Current list of beach attributes for the National Healthy Beaches Campaign
New form: http://www.healthybeaches.org/evaluation_full.htm

Ratings Criteria
The National Healthy Beaches Campaign (NHBC) promotes balance between recreational use of our nation's beaches and maintaining the environmental quality and safety of this prized resource. The NHBC rating is applicable for both Resort/Urban and Rural/Park beaches. The criteria for the latter is slightly less stringent than for resort and urban beaches, as they frequently have less facilities and little or no commercial development.

Resort/Urban and Rural/Parks Beaches

I. WATER QUALITY

Water quality evaluation is one of the most important determining factors for beach certification. Healthy Beaches are required to regularly evaluate their water quality to determine whether the water is safe for bathing purposes. Sampling should be done on a 30-day geometric mean, which is the mean of all

individual samples collected during five or more sampling events representatively taken over a 30-day period. Currently, for five plus sampling events, this is 35/100mm for Enterococci (marine) and for E.Coli 126/100mm. A beach shall use these EPA recommended water quality guidelines (or "as protective" per EPA guidelines) obtained from Government reports during the 2003/04 high-use season. Water quality standards define a measurable relationship between the quantity of the bacterial indicator in the water and the potential risk to human health associated with recreational water usage. E. coli and Enterococci show the strongest relationship with swimming-associated gastrointestinal illness.

*Bacteriological Indicators***
*Enterococci(marine) /100mm
*E. coli(fresh water) /100mm**

**The NHBC will obtain this information from the US EPA. *
www.epa.gov/waterscience/beaches/local/statrept.pdf

Beach Closures (on an annual basis):
0 1 - 2 3 – 4 5 - 6 more than 6

Algae in water and on the beach (rate by severity)
0 (absent) 1 2 3 4 (infested)

Red tide (number of occurences annually)
0 (absent) 1 2 3 4

II. SAND QUALITY

Beach width at low tide
Narrow (<30 ft.) 30-100 ft. 100-200 ft. Very wide (>200 ft.)

Oil and tar balls washed up on the beach (number of occurences annually)
0 1 2 3 4

Seaweed/Jellyfish on the beach (number of occurences annually)
0 1 2 3 4

Domestic animals allowed on the beach (e.g., dogs)
Yes No
If yes, are pooper scoopers used?_____
If yes, is there someone patroling the area to enforce proper clean-up 'pooper scooper' use? _____

Trash, litter, and glass, etc. at the start of the day.
A (rare) B C D (much)
*See note at the end of criteria section.

Is a beach sweeper used (please describe frequency)?_____

Beach material
Fine sand Medium sand Coarse sand Cobbles Rocky/Muddy

Bathing area bottom conditions
Fine sand Medium sand Coarse sand Cobbles Rocky/Muddy

Well-kept grounds/promenades or natural environment
Yes No

III. SAFETY

Is a public warning system in place to promptly alert the public in the event that the beach becomes unsafe (e.g. inclement weather conditions), unsanitary, or unhealthy in any manner?
Yes No

Are recordings kept of emergencies that happen?
Yes No

Rip currents
Never present Occasionally present Frequently present

Any drownings (on an annual basis)?
Yes No
If yes, provide information. _____

Shorebreaks (large waves breaking directly on the beach)
Never present Occasionally present Frequently present

Any major neck injuries or deaths (on an annual basis)?
Yes No
If yes, provide information. _____

Lifeguards (strongly recommended, but not required)
Present Absent
If not, is there adequate safety equipment on the beach?
Yes No

If unguarded, are adequate warnings/enclosures in place regarding potential hazards (e.g., rips, beach construction, etc.)?
Yes No

Mosquito or other pest outbreaks requiring major spraying (i.e., West Nile Virus)
Yes No
If yes, please provide information. _____

Longshore currents (during the bathing season)
Weak Moderate Strong

Beach slope (underwater)
Gently sloping bottom Moderately sloping bottom
Steeply sloping bottom Presence of deep holes or drop offs

Shark attacks (on an annual basis)
None Some
If you answered some, please provide information.
_____

Public safety (e.g., pickpockets, crime)
No problems Occasional incidents A problem area

Is there public information (e.g. local ordinances, laws, safety education) prominently posted with phone numbers and directions to the nearest life/safety services?
Hospital Police Coast Guard Local Authority

Is there a public information center or lifeguard base where information may be shown?
Yes No

Is first aid available on the beach?
Yes No

Are there any storm water overflows or sewage pipes nearby?
Yes No

IV. ENVIRONMENTAL QUALITY & MANAGEMENT

Healthy Beaches should promote peaceful and protective coexistance of sensitive plant/wildlife habitats with human recreation (e.g. turtle nesting; marked zones for swimmers, surfers and motorized craft).

Can you estimate the number of people in the water at peak period?_____

Vegetation nearby (i.e., sea oats, mangroves, trees, dunes)
None Few Many
(These natural environments help prevent erosion and lessen storm damage)

Any exotic or invasive species present?
Yes No
If yes, please list information_____

If sensitive areas exist, for example dunes, are facilities present such as boardwalks?
Yes No

Presence of seawalls, riprap, and concrete/rubble (that replaces natural habitats)
None Few Many

Buildings/urbanism
Pristine/wild A few buildings Many structures, but not offensive
Overdeveloped

Misfits (nuclear power station, offshore dumping)
Yes No
If yes, please describe
information_____

Off-road vehicles (during the beach season)
None present Few present Common

Intensity of beach use
Ample open space Many people Crowded Overcrowded
Can you give a figure for the peak period?_____

Is there a zonation system in place? For example, bathing, surfing, turtle nests, etc.?
Yes No

Has the beach a history of erosion problems?
Yes No
If yes, can you give a figure as to how much per annum?_____

V. SERVICES

The facilities at a Healthy Beach must be kept clean and safe at all times.

Bathroom facilities availability
Present Absent

If present, what is their condition?
Clean, good condition Dirty, unkempt

Are there facilities for people with disabilities?
Yes No

Shower facilities availability
Present Absent

If present, what is their condition?
Clean, good condition Dirty, unkempt

Snack bars/restaurants
Present Absent

Recycling recepticles
Available None available

Parking availability
Parking available Difficult to find parking Cars turned away
If cars turned away, how many days in the year does this occur?_____

Drinking water for public - clearly marked and protected within walking distance from the beach
Yes No

Public telephones - working and within walking distance from beach
Yes No

Beach Access
Good access Limited access Access a problem
Access for people with disabilities (e.g. ramp)
Yes No

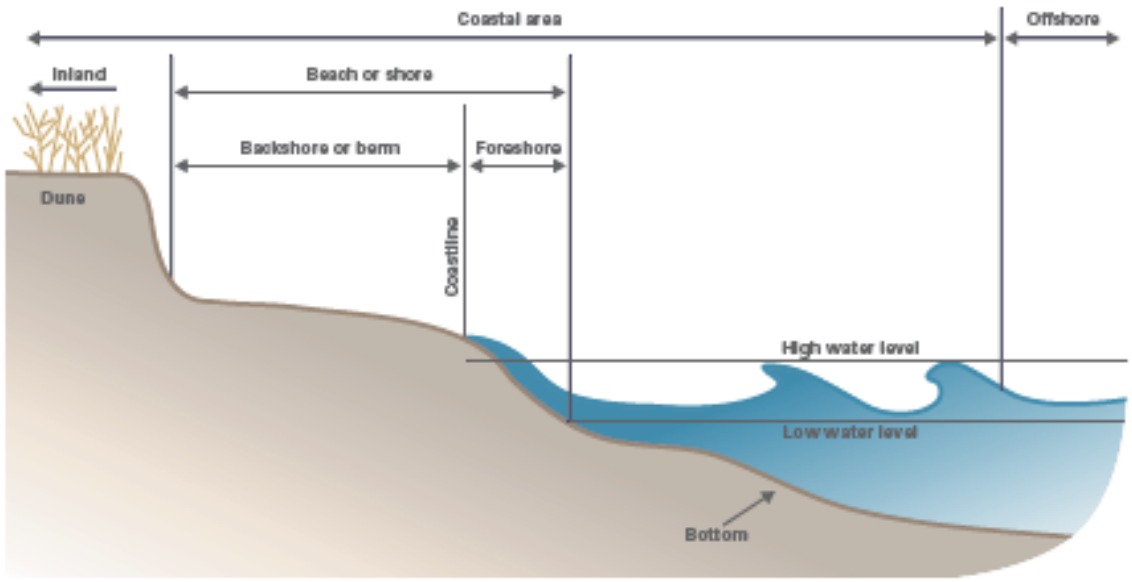
*Litter Categories for grading a beach (in no particular order)

Category	Type	A	B	C	D
1 Sewage Related Debris	General e.g. condom	0	1-5	6-14	>15
	Q tips	0-9	10-49	50-99	>100
2 Large Litter	e.g. grocery cart, chair	0	1-5	6-14	>15
3 General Litter	e.g. cola can, water bottle	0-49	50-499	500-999	>1000
4 Harmful Litter	Broken Glass	0	1-5	6-24	>25
	Other e.g. syringe	0	1-4	5-9	>10
5 Piles of material	e.g. debris, seaweed	0	1-4	5-9	>10
6 Oil		None	Trace	Noticeable	Objectionable
7 Feces		0	1-5	6-24	>25

Reference: EA/NALG, (2000), "Assessment of Aesthetic Quality of Coastal and Bathing Beaches", Monitoring Protocol and Classification Scheme, UK Environmental Agency.

Procedure

1. Find an access point - if possible the main one - to the beach.
2. Select points fifty yards either side of the access point and stretching from the high tide waterline to the backshore.
3. Count the number of litter items within this area for each of the above seven categories.
4. For each row (category), circle the box associated with the counted number.
5. Take the letter grade of the furthermost (to the right) circled box and enter it into the sand quality sectional box.



Dr. Stephen P. Leatherman (aka Dr. Beach), is the founder of NHBC. Dr. Leatherman, Professor and Director of the Laboratory for Coastal Research at Florida International University (FIU), received his Ph.D. in Environmental (Coastal) Sciences from the University of Virginia, and completed his undergraduate degree in Geosciences at North Carolina State University. Prior to joining FIU, Stephen was Professor and Director of the Laboratory for Coastal Research at the University of Maryland; Director of the National Park Research Unit at the University of Massachusetts, Amherst; and Assistant Professor in the Department of Geology at Boston University.

Dr. Leatherman has authored or edited 16 books, including *Sea Level Rise: Causes and Consequences*; *Barrier Island Handbook*; *Overwash Processes*; *Cape Cod: From Glaciers to Beaches*; and *America's Best Beaches*. He has also authored over 200 journal articles and technical reports, including articles in both *Science* and *Nature*.

DR. STEPHEN P. LEATHERMAN'S FIFTY CRITERIA

PHYSICAL FACTORS (relate to the vacation/holiday season)	CATEGORIES 1	2	3	4	5
1. Beach width at low tide	<10 m narrow	10-30 m	30-60 m	60-100 m	>100 m wide
2. Beach material	cobbles	sand/cobbles	coarse sand	-----	fine sand
3. Beach condition or variation	erosional	-----	stable	-----	depositional
4. Sand softness	hard	-----	-----	-----	soft
5. Water temperature	cold/hot	-----	-----	----	warm (70° -80° F)
6. Air temperature (midday)	< 60° F > 100° F	-----	-----	-----	80° -90° F
7. Number of sunny days	few	-----	-----	-----	many
8. Amount of rain	large	-----	-----	-----	little
9. Wind speeds	high	-----	-----	-----	low
10. Size of breaking waves	high/dangerous	-----	-----	-----	low/safe
11. Number of waves/ width of breaker zone	none	1-2	3-4	5	6+
12. Beach slope (underwater)	steeply sloping bottom	---	----	----	gently sloping bottom
13. Longshore current	strong	-----	-----	-----	weak

14. Rip currents	often	-----	-----	-----	never
15. Color of sand	gray	black	brown	light tan	white/pink
16. Tidal range	large (>4 m)	3-4 m	2-3 m	1-2 m	small (<1 m)
17. Beach shape	straight	-----	-----	-----	pocket
18. Bathing area bottom conditions	rocky, cobbles, mud	-----	-----	-----	fine sand
19. Turbidity	turbid	-----	-----	-----	clear
20. Water color	gray	-----	-----	-----	aquablue
21. Floating/suspended human material (sewage, scum)	plentiful	-----	-----	-----	none
22. Algae in water amount	infested	-----	-----	-----	absent
23. Red tide	common	-----	-----	-----	none
24. Smell (eg, seaweed, rotting fish)	bad odors	-----	-----	-----	fresh salty air
25. Wildlife (eg, shore birds)	none	-----	-----	-----	plentiful
26. Pests (biting flies, ticks, mosquitoes)	common	-----	-----	-----	no problem
27. Presence of sewerage/runoff outfall lines on/across the beach	several	-----	-----	-----	none
28. Seaweed/jellyfish on the beach	many	-----	-----	-----	none
29. Trash and litter (paper, plastics, nets, ropes, planks)	common	-----	-----	-----	rare
30. Oil and tar balls	common	-----	-----	-----	none
31. Glass and rubble	common	-----	-----	-----	rare
32. Views and vistas - Local scene	obstructed	-----	-----	-----	unobstructed
33. Views and vistas - Far vista	confined	-----	-----	-----	unconfined
34. Buildings/Urbanism	overdeveloped	-----	-----	-----	pristine/wild
35. Access	limited	-----	-----	-----	good
36. Misfits (nuclear power station, offshore dumping)	present	-----	-----	-----	none

37. Vegetation (nearby). none ----- ----- ----- many
Trees, sand dunes

38. Well-kept grounds/promenades no ----- ----- ----- yes
or natural environment

39. Amenities none ----- ----- ----- some
(showers, chairs, bars, etc)

40. Lifeguards none ----- ----- ----- present

41. Safety record (deaths) some ----- ----- ----- none

42. Domestic animals (eg, dogs) many ----- ----- ----- none

43. Noise (cars, much ----- ----- ----- little
nearby highways, trains)

44. Noise (eg, crowds, radios) much ----- ----- ----- little

45. Presence of seawalls, riprap, large amount ----- ----- ----- none
concrete/rubble

46. Intensity of beach use overcrowded ----- ---- ----- ample open space

47. Off-road vehicles common ----- ----- ----- none

48. Floatables in water common ----- ----- ----- none
(garbage, toilet paper)

49. Public safety common ----- ----- ----- rare
(eg, pickpockets, crime)

50. Competition for free use of beach many ----- ----- ----- few
(eg, fishermen, boaters, water-skiers)

From: http://www.drbeach.org/drbeach/drbeach_50_criteria.htm
The development of this 50-criteria list is the focus of an article in *Journal of Coastal Research* (Leatherman, 1997).

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