

Broward County Beach Demonstration Project

Public Perception Phase:
Research Findings Report

MARS Research, Inc.
December 2004

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I. Executive Summary

Executive Summary

Overall, Concept Appealing & Interesting

- Respondents across audience (Beach Professionals, Tourism Representatives, and Broward County Residents) clearly recognize the importance of tourism and beaches to Broward County.
 - Respondents also share perceptions that erosion is a significant issue for Broward County beaches.
 - ❖ While the general public acknowledges the importance of addressing beach erosion, Beach Professionals and Tourism Representatives are especially concerned.
- Overall, findings indicate that Broward County Beach Demonstration Project (using pulverized recycled glass to re-nourish Broward’s beaches) is generally appealing, interesting, and relevant to the public.
 - Quantitative results in the “moderate” range reflect the fact, that while respondents like this concept, they voice questions, concerns, and the desire for more information.
- Before lending full support or determining full feasibility, respondents say they need more information about the Project.

Executive Summary

Perceived Benefits & Concerns

BROWARD COUNTY Beach Demonstration Project	
<i>Key Benefits</i>	<i>Key Concerns</i>
<ul style="list-style-type: none">▪ Viable solution to problem of diminishing sources of sand	<ul style="list-style-type: none">▪ Lack of sufficient data and information about the Project
<ul style="list-style-type: none">▪ Feasible approach for treating beach erosion and re-nourishing Broward's beaches	<ul style="list-style-type: none">▪ Safety of sand-glass mixture on beach
<ul style="list-style-type: none">▪ True "closed loop"— Positive application of waste material, recycled glass, to treat erosion	<ul style="list-style-type: none">▪ Effect on environment and wildlife
	<ul style="list-style-type: none">▪ Reactions of beachgoers (residents and tourists) to using glass on the beach
	<ul style="list-style-type: none">▪ Cost of mixture and implementation

Executive Summary

Some Differences By Audience

- Compared with the Tourism Representatives and Broward County residents, Beach Professionals generally express lower levels of appeal for the concept.
 - They are still receptive to the idea, but tend to express more questions and greater skepticism.
 - Findings suggest that Beach Professionals, overall, regard the adoption of this Project to be an uphill challenge.
 - ❖ They are especially concerned about the technical performance of the sand-glass mixture and navigating through the permitting process.
- While Tourism Representatives voice similar concerns to Beach Professionals, their concerns tend to be overshadowed by the perceived benefits of the Project.
 - Finding a viable solution to erosion on Broward's beaches is inexorably linked to the health of the tourism industry and their own livelihoods.
 - The number one objective of Tourism Representatives is to ascertain that Broward County beaches continue to exist and draw tourists. They believe that the Project would help achieve this objective.
- Findings also indicate some differences in receptivity according to key demographic and psychographic characteristics among Broward County residents. Respondents with the following characteristics tend to find the concept more appealing, interesting, and relevant (these characteristics will be discussed in detail in Section V C.)
 - Older in age (especially 60+)
 - Do not have children living at home
 - Live in close residential proximity to the beach (less than 10 miles)
 - Visit the beach frequently (At least once/month)
 - Have lived for long periods of time in Broward County (especially 20+ years)
 - Deem beach erosion to be a very important issue
 - Possess prior familiarity with the Beach Demonstration Project

Executive Summary

Recommendations: Implications

- All in all, findings suggest that the Broward County Beach Demonstration Project is feasible and should move forward. However, in order to be sure, respondents must have key concerns and questions addressed.
- It is thus essential to implement an educational program that will provide the information and evidence sought by the public. In framing an educational program, the following are key concerns to address:
 - Safety of using sand-glass mixture on the beach
 - Effect on the environment and wildlife
 - Cost of mixture and implementation
 - Impact of using mixture upon the public's perceptions of Broward County beaches
- While the above issues are relevant to all three public audiences, is it also important to consider some specific audience needs:
 - Beach Professionals are especially interested in learning about the geotechnical performance and the environmental compatibilities of the sand-glass mixture on the beach.
 - Tourism Representatives will need to understand how the sand-glass mixture affects the aesthetics of the beach as well as the public's (both residents and tourists') perceptions of the beach.
 - Broward County residents should ideally hear about how this Project will benefit their County in terms of beach erosion and positive applications of recycling.
 - ❖ Addressing issues of cost is also likely a good idea in educating the residential public.
 - ❖ Younger residents, families with children, and those who live farther away from the beach indicate greater concerns than other types of residents and should be especially targeted in the educational program.

Executive Summary

Recommendations: Ideal Next Steps

- To garner this desired data and information, the Project should test the sand-glass mixture on the beach as planned.
- This testing should not only examine the actual geotechnical performance and environmental compatibility of the sand-glass mixture on the test patches, but should be used to gauge public perceptions to the actual product on the beach.
 - Findings from this research study show that respondents' perceptions of the concept improve once they tangibly interact with the sand-glass mixture.
 - The structure of this testing should be in the form of beach intercepts with both local residents and tourists to solicit feedback about the look, feel, and acceptability of the sand-glass mixture in its natural environment.
- Findings clearly underscore the need to inform and educate the general public about this Project. Yet, in terms of communicating about the Project to tourists, findings suggest that “less is more.”
 - Most think that tourists will not know the difference between natural sand and the sand-glass mixture.
- Communications about the Project should ideally emphasize the following messages:
 - Environmentally responsible
 - Eco-sound; eco-tourism
 - Economically feasible; potentially cheaper than current re-nourishment programs
 - Broward County has beautiful, re-nourished beaches
 - “Win-win” project, dual benefits of re-nourishing Broward’s beaches while finding a positive application for recycled glass, currently a waste material
 - Benefits Broward County at large
 - Healthy beaches promote healthy economy
 - Project will help to beautify and maintain beaches for residents they represent
 - Provides recycling solution for the County
- Once educational concepts and messages have been developed, they should be tested with the public before implementation. The most effective way to do so is via concept/message testing focus groups with Broward County residents.



II. Background & Objectives

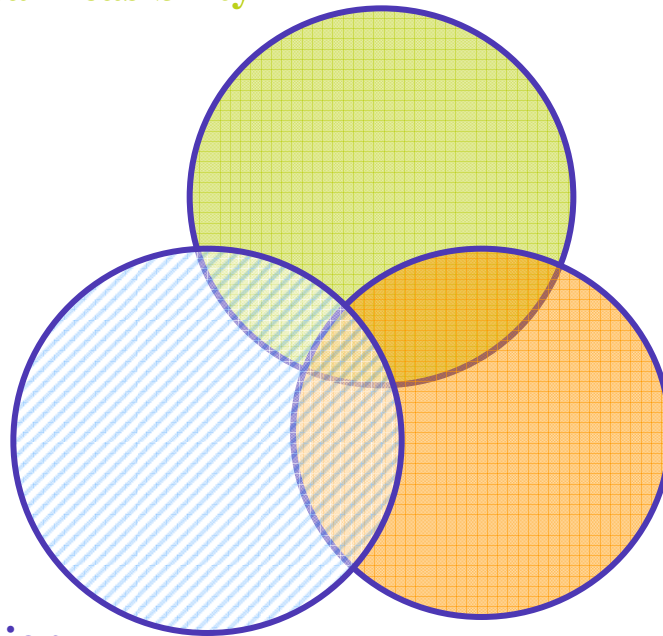
Background

- The Broward County Beach Demonstration Project is a multi-phased study designed to determine the feasibility of using recycled glass for beach nourishment and erosion control along Broward's beaches. The Phases include:
 - Geotechnical Feasibility
 - Environmental Compatibility
 - Public Perception
- MARS Research (MARS) was commissioned to conduct the Public Perception Phase of this study. This Phase comprises two main components: targeted focus groups and a public opinion telephone survey.

Public Perception Phase: Part of Larger Whole

Beach Demonstration Project Success = Sum of Three Phases

Technical Feasibility



Public Perception

Environmental Compatibility

Objectives

- The overall objective of this research study is to assess public perceptions of the Broward County Beach Demonstration Project on the part of three key audiences:
 - Beach Professionals
 - Tourism Representatives
 - Broward County Residents
- More specific objectives include:
 - Gauge appeal of Project concept
 - Identify key perceived benefits and concerns
 - Evaluate public support for and acceptance of program
 - Provide recommendations to inform future directions and communications



III. Methodology

Combined Qual./Quant. Research

- To achieve these objectives, MARS conducted a combined qualitative and quantitative research plan.
 - *Qualitative*: Two focus groups with targeted public audiences
 - ❖ Beach Professionals
 - ❖ Tourism Representatives
 - *Quantitative*: Random phone survey with Broward County residents

Methodology

Focus Group: Beach Professionals

- The focus group with Beach Professionals was conducted on September 30, 2004 at the Marco Island Marriott Resort in Marco Island, FL.
- The focus group included 9 participants who were all attending the FSBPA Conference and indicated a strong level of interest in topics surrounding beach erosion and nourishment. (See Appendix D for characterization of participants.)
- During the focus group, participants were presented with concept statements (See Appendix B) about the Project as well as samples of the sand-glass mixture for examination and discussion.
- The focus group lasted approximately 2 hours and was audio and videotaped.

Focus Group: Tourism Representatives

- The focus group with Tourism Representatives was conducted on October 18, 2004 at MARS Research in Coral Springs, FL.
- It included 8 participants who all indicated familiarity with topics surrounding beach erosion and nourishment. (See Appendix D for characterization of participants.)
- As with the Beach Professionals focus group, participants were presented with concept statements (see Appendix B) about the Project and samples of the sand-glass mixture for examination and discussion.
- The focus group lasted 2 hours and was also audio and videotaped.

Phone Survey: Broward County Residents

- A random telephone study was conducted from November 8 -12, 2004 with Broward County residents.
- The survey included a total sample of 402 respondents who were recruited from a sample list of Broward County zip codes. Respondents had to be:
 - Current Broward County residents
 - 18 years of age or older
- The respondents reflected a mix of:
 - Gender
 - Household income
 - Family status
 - Level of completed education
- The margin of error for a sample of 402 is +/- 5% at the 95% confidence level.

Public Perception Sample in Sum

RESEARCH		SCOPE
<i>Qualitative</i>	Focus Group With Beach Professionals	n = 9
	Focus Group With Tourism Representatives	n = 8
<i>Quantitative</i>	Random Phone Survey with Broward County Residents	n = 402



IV. Overview of Research Findings

A blue-tinted photograph of a vast ocean under a cloudy sky. The text "A. Context" is centered in the middle of the image.

A. Context

Tourism & Beaches Vital to Broward County

- Respondents across audiences clearly recognize the importance of tourism and beaches to Broward County.
 - 96% of residents* agree that tourism is vital to the economy.
 - 95% acknowledge that Broward's beaches are an important part of the economy.

"We are a tourist destination, plain and simple." – Beach Professional

"When you say Fort Lauderdale, you think beaches. That's the basis of our economy." – Tourism Representative

* In this report, when percentages are used, they reflect the viewpoint of Broward County residents from the phone survey.

High Awareness of Erosion Problem

- Respondents share perceptions that erosion is a significant issue for Broward County beaches.
 - 95% agree that beach erosion is an important issue.
 - 91% feel that the government should spend money to protect the beaches from erosion.
- While the general public acknowledges the importance of addressing beach erosion, Beach Professionals and Tourism Representatives are especially concerned.

*“Sand is dwindling. We need to look at other sources.”
– Beach Professional*

“We sell beaches. Erosion is a huge problem. We have to find a solution toward maintaining our beaches.” – Tourism Representative

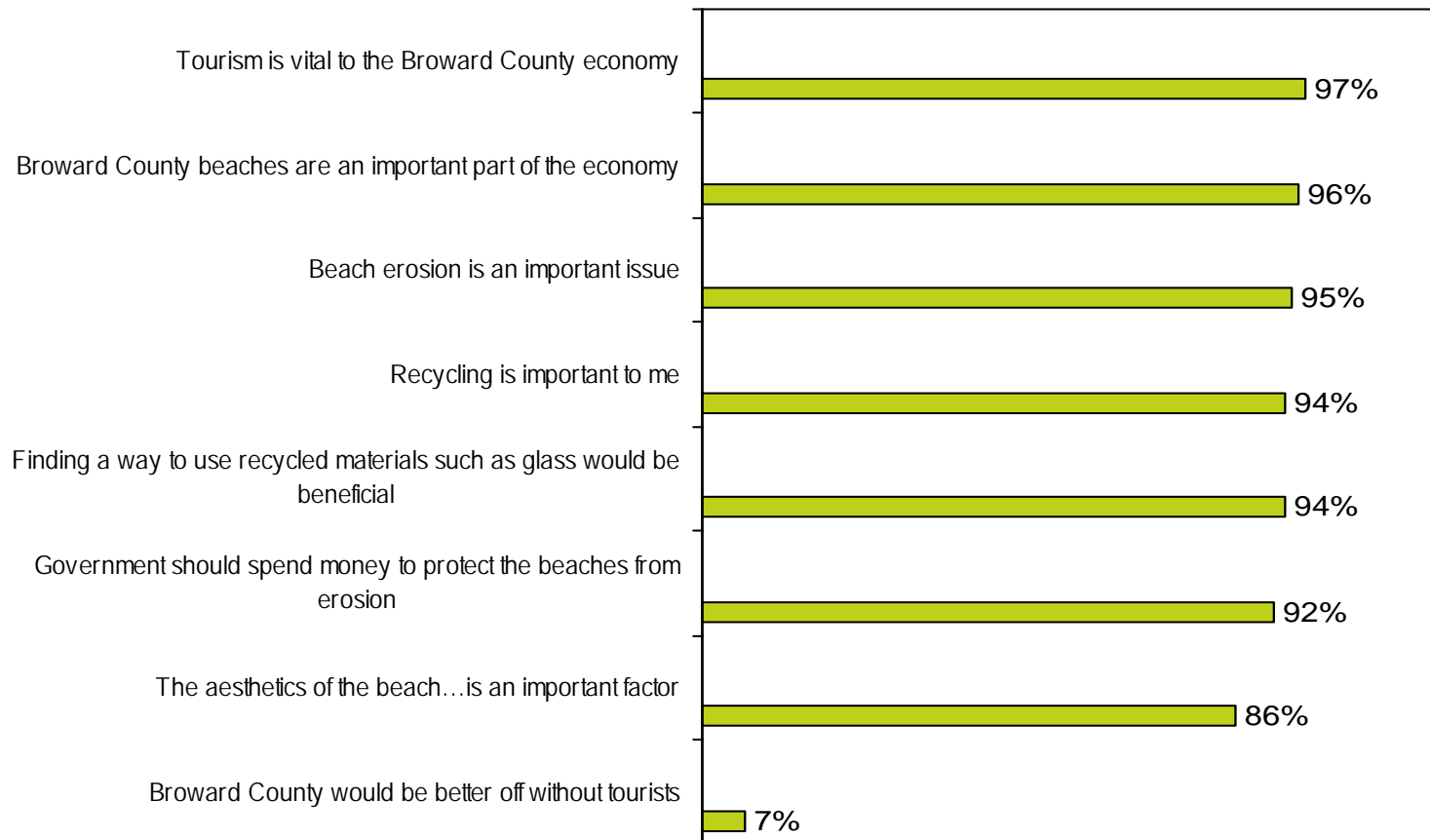
Recycling is Also Important to Public

- Findings also show that the public is interested in and concerned about recycling.
 - 94% agree that recycling is important to them.
 - 95% say that “finding a way to use recycled materials such as glass would be beneficial.”

“Recycling is positive hot button...” – Beach Professional

Tourism, Beaches, and Recycling are Very Important to the Public

% OF RESPONDENTS WHO AGREE (COMPLETELY/SOMEWHAT) WITH EACH STATEMENT





B. Reactions to Concept of Using
Recycled Glass for Beach Nourishment

Concept is Generally Appealing

- Overall, respondents share common overall reactions to the concept of using pulverized recycled glass to re-nourish Broward County beaches.
- Most find the concept interesting, appealing, and relevant.
 - 81% are interested in the concept.
 - ❖ 52% somewhat interested; 29% very interested.
 - 72% find the concept appealing.
 - ❖ 48% find the concept somewhat appealing. 24% very appealing.
 - 72% think the concept is relevant.
 - ❖ 49% somewhat relevant; 26% very relevant.

“It’s a good solution for maintaining our beaches.” – Beach Professional

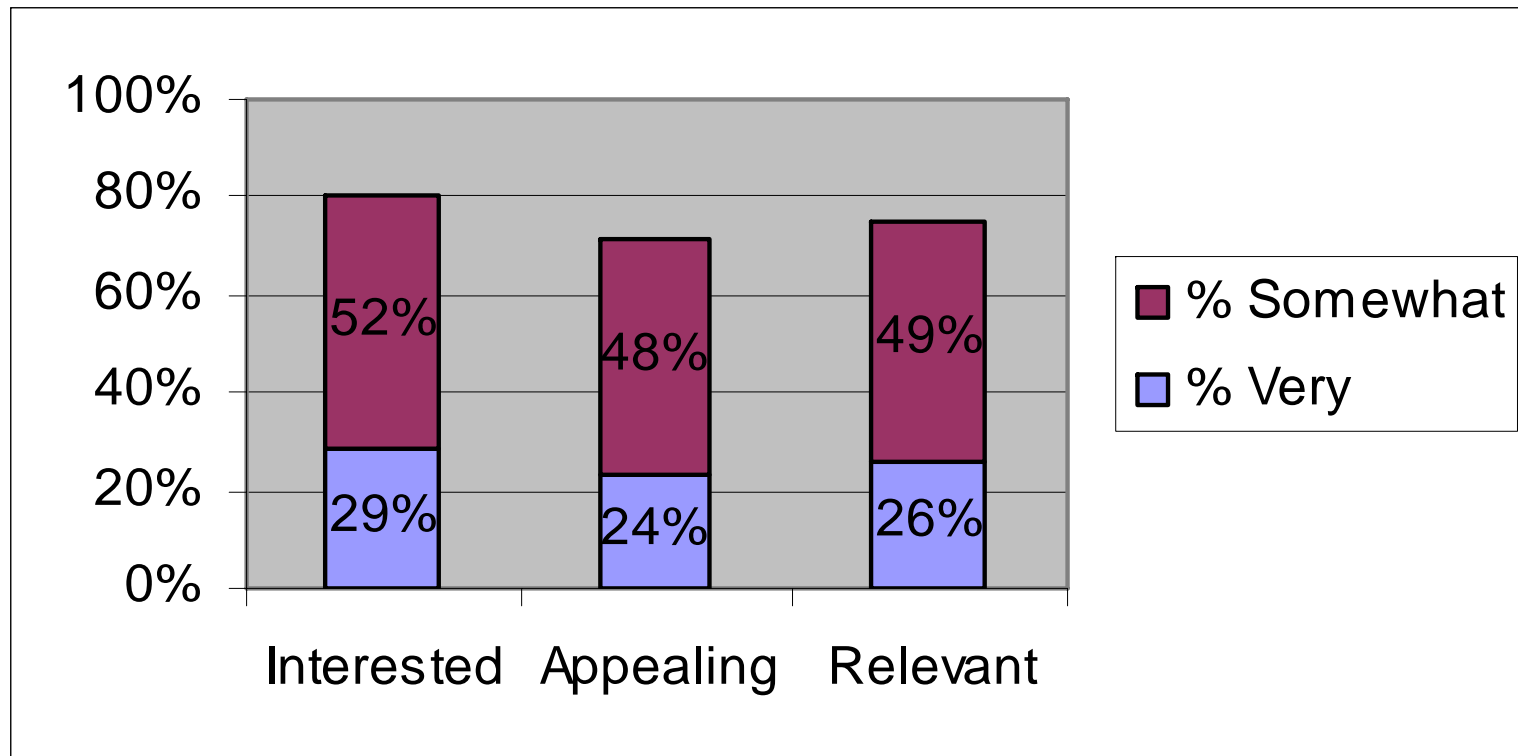
“Timely. Hard to find alternative sources of sand.”

– Tourism Representative

“Treating erosion by getting rid of a extra glass is very innovative...”

– Broward County Resident

Moderate Ratings of Concept Overall



Appeal is Tempered By Questions

- Quantitative findings show that the majority of respondents assign moderate ratings in terms of overall concept interest, appeal, and relevancy.
 - These moderate ratings reflect the fact, that while respondents like this concept, they voice questions, concerns, and the desire for more information.
 - Before lending full support or determining full feasibility, respondents say they need more information about the Project.

*“Certainly worth considering further, but right now I have insufficient information.”
– Beach Professional*

“I have an enormous list of questions that need to be answered before I can get behind this.” – Tourism Representative.

“(Before assigning an appeal rating to the concept) Where can I check a box that says ‘not enough information?’” – Beach Professional

“I like it, but I don’t know. I’ve got some concerns.” – Broward County Resident

Some Common Questions....

“Will it cut my feet?” – Broward County Resident

*“What will it cost?”
– Tourism Representative*

*“How will it affect the wildlife,
especially the seaturtles?” – Beach Professional*

*“How will it look on the beach?....”
– Broward County Resident*

*“Will tourists be able to build sand castles with
it?”– Tourism Representative*

Beach Professionals Tend to Have More Questions, Skepticism

- Compared with Tourism Representatives and Broward County residents, Beach Professionals generally express lower levels of appeal for the concept.
- They are still receptive to the idea, but tend to express more questions and greater skepticism.
- Findings suggest that Beach Professionals, as a group, regard the adoption of this Project to be an uphill challenge.
 - They are especially concerned about the technical performance of the sand-glass mixture and navigating through the permitting process.

“I see this as an uphill battle.” – Beach Professional

Receptivity Also Differs By Variables Among Broward County Residents

- Findings also indicate some differences in receptivity according to key demographic and psychographic characteristics among Broward County residents.
- Respondents with the following characteristics tend to find the concept more appealing, interesting, and relevant (these characteristics will be discussed in detail in Section V C.)
 - Older in age (post 60 in particular)
 - Do not have children living at home
 - Live in closer residential proximity to the beach (under 10 miles)
 - Visit the beach more frequently (once a month or more)
 - Have lived for longer periods of time in Broward County (20+ years)
 - Deem beach erosion to be a very important issue
 - Possess prior familiarity with the Beach Demonstration Project

Tactile Experience Increases Appeal

- The qualitative findings show that concept receptivity and appeal increase dramatically after participants interact with the actual product sample.
 - Once respondents see samples of the pulverized recycled glass as well as the sand-glass mix, reactions to the concept improve significantly.
 - Respondents are highly impressed with the product's texture and appearance.

*"Wow, they've done a great job with this. It looks much better than I expected."
– Beach Professional*

"Looks and feels like the sand we've got out on the beach now." – Tourism Representative

- Still, respondents' questions and desire for additional information about the Project remain.

"It does look good, but my questions still haven't been answered." – Tourism Representative



C. Perceived Benefits & Concerns

Perceived Benefits & Concerns in Sum

BROWARD COUNTY Beach Demonstration Project	
<i>Key Benefits</i>	<i>Key Concerns</i>
<ul style="list-style-type: none"> ▪ Viable solution to problem of diminishing sources of sand 	<ul style="list-style-type: none"> ▪ Lack of sufficient data and information about the Project
<ul style="list-style-type: none"> ▪ Feasible approach for treating beach erosion and re-nourishing Broward's beaches 	<ul style="list-style-type: none"> ▪ Safety of sand-glass mixture on beach
<ul style="list-style-type: none"> ▪ True "closed loop"— Positive application of waste material, recycled glass, to treat erosion 	<ul style="list-style-type: none"> ▪ Effect on environment and wildlife
	<ul style="list-style-type: none"> ▪ Reactions of beachgoers (residents and tourists) to using glass on the beach
	<ul style="list-style-type: none"> ▪ Cost of mixture and implementation

Key Benefit: Way to Address Erosion

- Across audiences, participants agree that implementation of the Broward County Beach Demonstration Project offers the following key benefits:

- A viable solution to the problem of diminishing sources of sand.

“Sources of sand are being used up. We need a solution and...this is a good direction.” – Beach Professional

- Feasible way to address beach erosion and nourish Broward County’s beaches.

“Sand [to re-nourish our beaches] is in short supply. We need to figure something out...it would certainly make my job a lot easier if I could walk out there everyday of the week and still know I’m going to have the beach.” – Tourism Representative

“Sounds like a way to keep our beaches beautiful.” – Broward County Resident

Key Benefit: True “Closed Loop”

- The positive application of using recycled glass, now an overabundant waste material, to treat erosion is perceived to be a major benefit.

*“It’s like a win/win. You get rid of a waste material and provide fill for beach nourishment.”
– Beach Professional*

*“Dual benefit. I like that the project also provides a recycling solution for the County.”
– Tourism Representative*

- Quantitative results indicate that the “positive application of recycled glass” scores the highest overall percentage (40%) as a potential benefit of the sand-glass mixture.

“Great and productive way to get rid of excessive waste.” – Broward County Resident

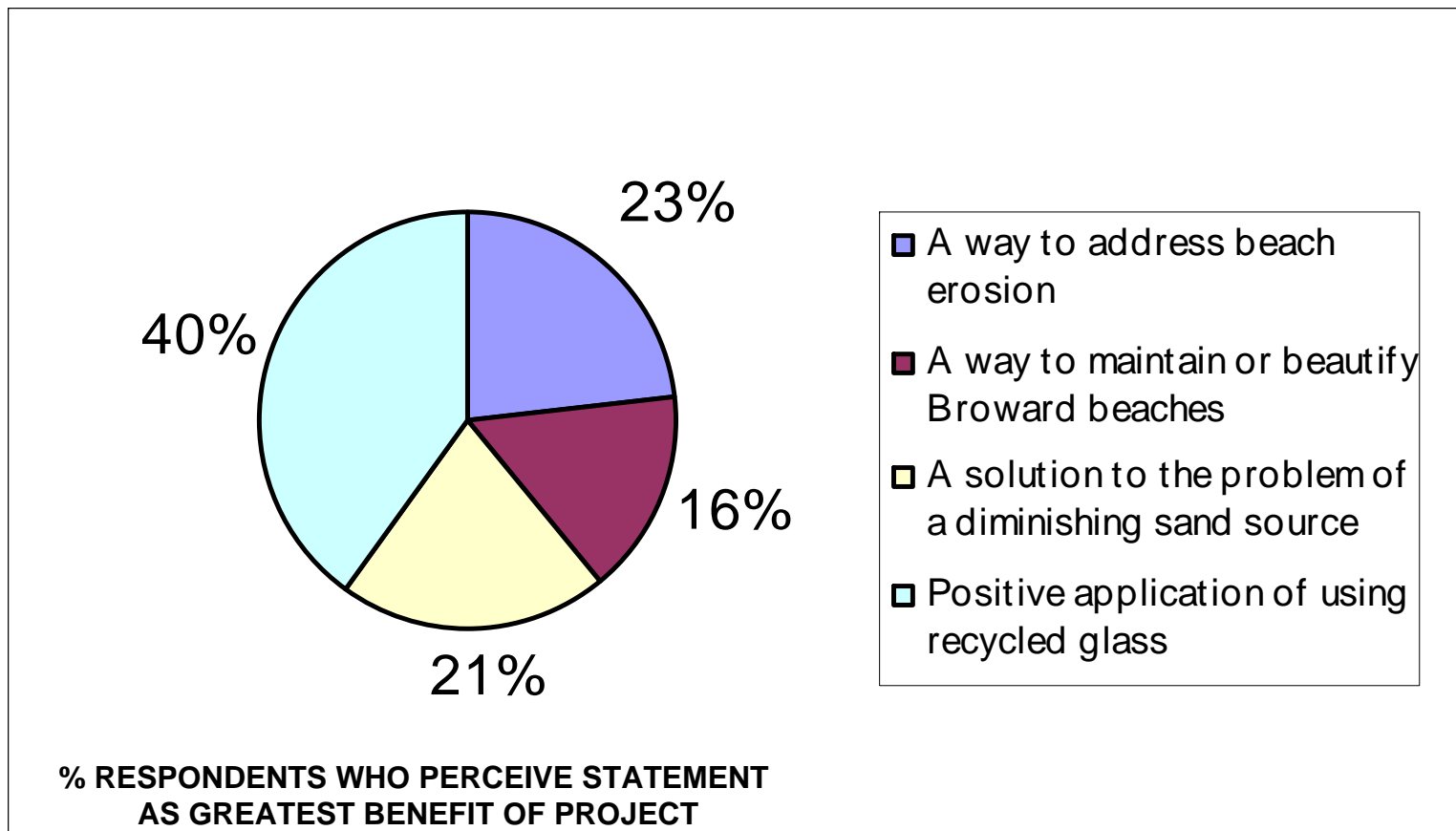
- Findings suggest that this “closed loop” aspect of the program is its greatest selling point to the public.

“They really should emphasize the dual benefits about this program to the people who live here.” – Tourism Representative

*“Anything that can be recycled and then used to help something else is a great idea.”
– Broward County Resident*

Key Benefits at a Glance

- **Positive application of using recycled glass to address erosion ranks as most beneficial aspect of sand-glass mixture.**



Key Concerns Linked to Lack of Info

- As mentioned, the primary concern is the lack of sufficient information and data about the Project in general.

“I just don’t have enough information about the Project or its effects.”

– Beach Professional

“There are so many unknowns...A lack of full understanding.”

– Tourism Representative

“Have there been past studies about this?...I need to know more about the concept.”

– Broward County Resident

Walking on Broken Glass?!

- A significant concern on the part of all three audiences is the safety of the sand-glass mixture on the beach.
- Hearing the word “glass” underscores concerns about the performance of the sand-glass mix on the beach, and especially of public perception.

“You have got to call it something other than ‘pulverized glass.’” – Beach Professional

“Will tourists get glass inside their bathing suits...can it cut them?” – Tourism Representative

- Indeed, the safety of the sand-glass mixture is the number one concern of Broward County residents.

“Will glass get into my eye and cut me?” – Broward County Resident

“Walking on broken glass—doesn’t sound particularly safe.” – Broward County Resident

*“What if my kids pick it up and then get glass in their mouths? Will they get hurt?”
– Broward County Resident*

Some Other Specific Concerns

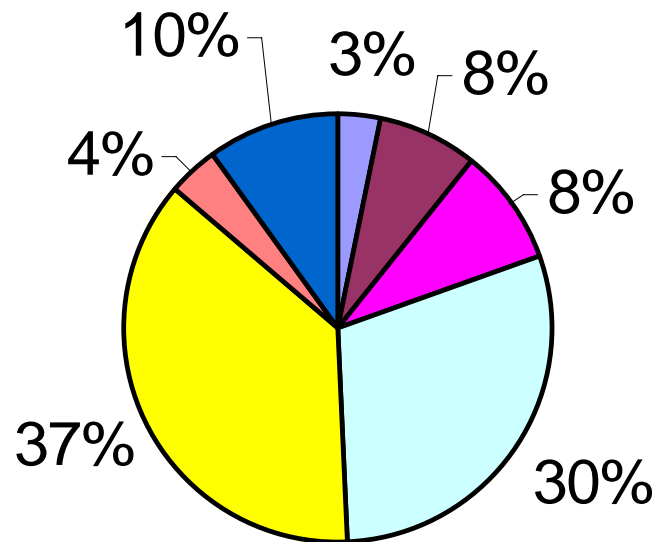
- Other specific concerns include:
 - Effect on environment
“What are the environmental effects of glass on the beach?” – Beach Professional
 - Public perception of using recycled glass on Broward’s beaches
*“How is it going to feel on the feet of tourists? Will they be okay with it?”
– Tourism Representative*

“I’d be concerned that tourists wouldn’t come anymore if they knew we had glass on our beaches.” – Broward County Resident
 - Cost
*“Is it going to be cheaper than what we currently pay to [re-nourish the beach]?”
– Tourism Representative*

*“Where are they going to find the money to do this...out of our taxes?”
– Broward County Resident*
- Beach Professionals and Tourism Representatives seek more technical information about the performance and properties of the sand-glass mixture on the beach (as will be delineated in the following Section V.)

Key Concerns at a Glance

- **Safety of mixture and effects on the environment seen as greatest concerns of sand-glass mixture.**



- They way the glass/sand mixture looks
- The way the glass/sand mixture feels
- The cost of mixing & laying the glass/sand mixture
- The effects on the environment & wildlife
- The safety of the glass/sand mixture
- The cleanliness of the glass/sand mixture
- Perception of tourists and general public

% RESPONDENTS WHO PERCEIVE STATEMENT AS GREATEST CONCERN OF PROJECT



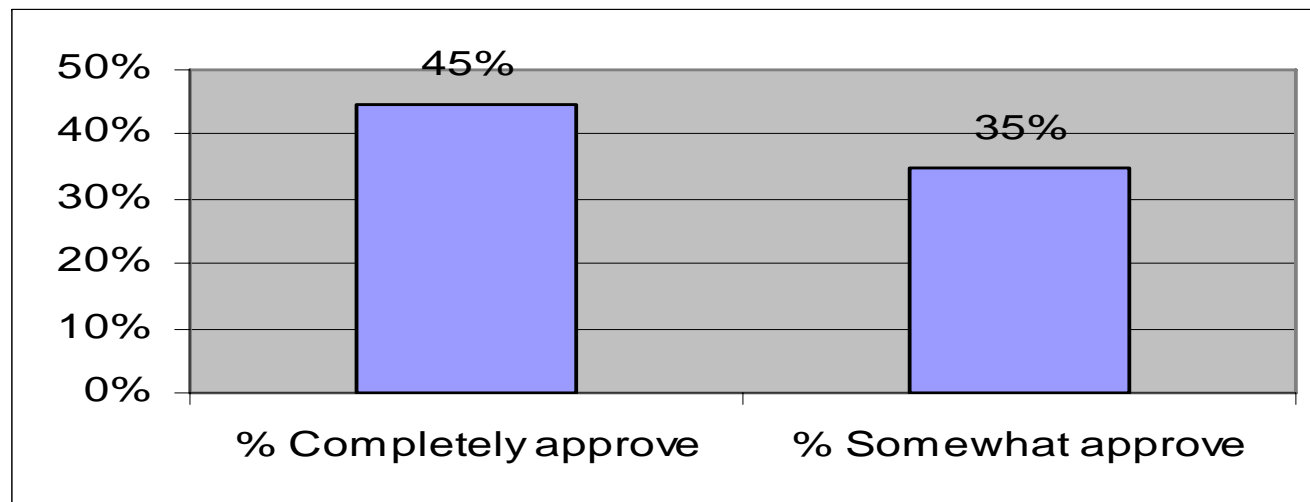
D. Intent to Support

Most Approve of Concept

- Overall, concept approval runs high with nearly 8 in 10 approving.
 - 45% completely approve of the concept.
 - 34% somewhat approve.
 - Only 9% disapprove of the concept.
- Qualitative findings suggest that approval ratings would likely be even higher once more information was provided and questions positively addressed.

“If I knew all these questions were not going to a problem, I’d support it.” – Tourism Representative

“I’d like to see the results of testing...on the beach. If it all worked out okay, I think it’s an awesome idea and they should go forward.” – Broward County Resident



What They Don't Know Won't Hurt 'Em

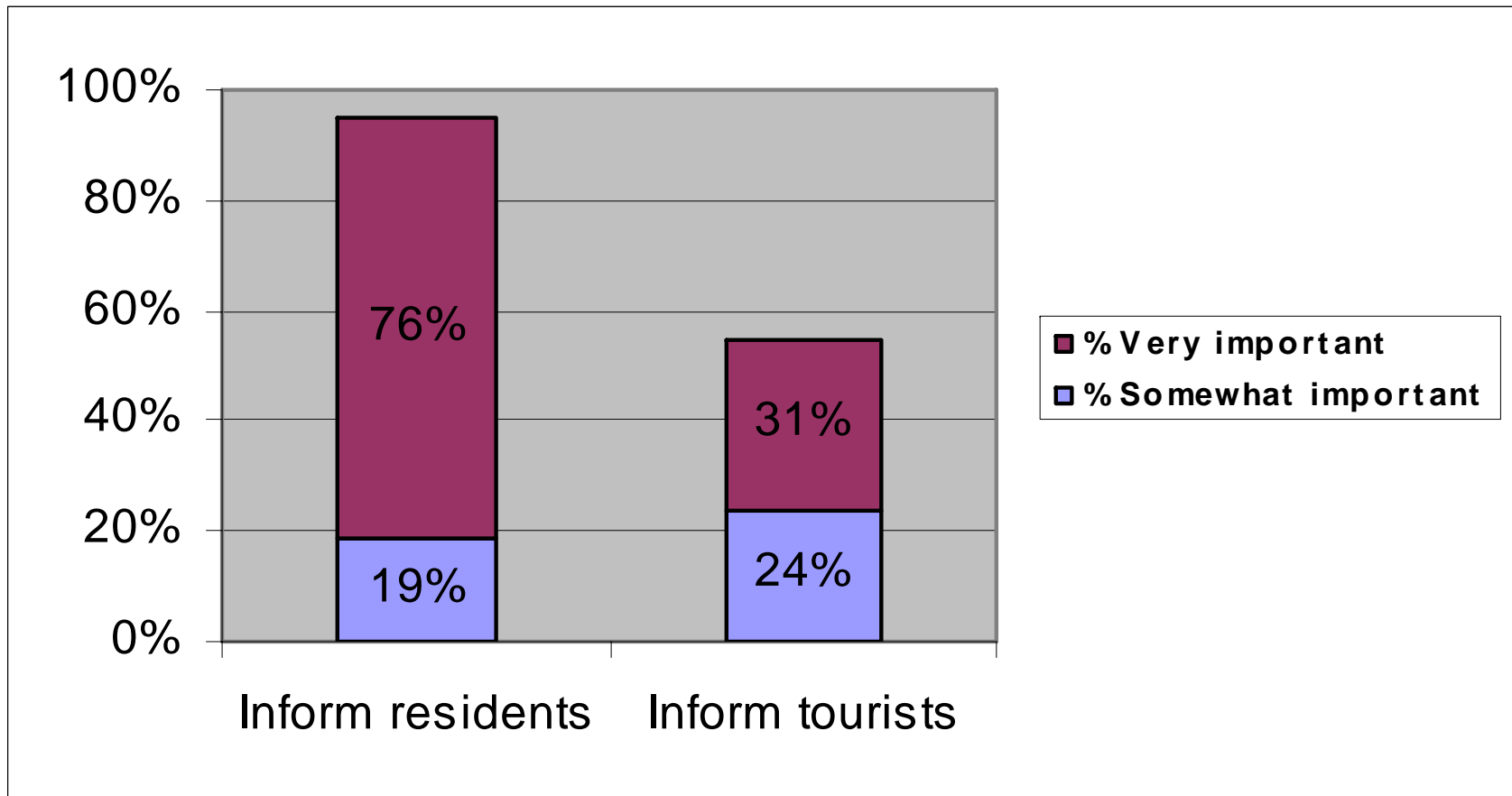
- Respondents, in general, do not deem it necessary to inform tourists about the Project before they visit the area.

"I'd say 99.9% of the public wouldn't know the difference between this and natural sand."

– Tourism Representative

- However, they do think it is important to educate Broward County residents.
 - 95% say it is somewhat or very important to inform residents about the Project.

Focus on Informing Residents, Not Tourists





V. Findings By Audience

A blue-tinted photograph of a vast ocean under a cloudy sky. The text "A. Beach Professionals" is centered in the middle of the image.

A. Beach Professionals

Beach Professionals' First Concern: Impact on Wildlife & Environment

- Concerns about the environmental impact of using pulverized recycled glass to nourish Broward's beaches are paramount for Beach Professionals.

"How is this going to affect the sea turtles and the microscopic animals that live in the sand?" – Beach Professional

"I need to know the long-term effects on the wildlife. It would take years of trial to study how the glass impacts turtle nesting, bird feeding..." – Beach Professional

Leary of Permitting Process Involved

- Beach Professionals also express strong concerns about the permitting process and securing permission from regulatory agencies.

“We’ve all been through it...it takes a lot to satisfy the [permitting] agencies. We have problems even with regular sand.” – Beach Professional

- Findings suggest that, in general, Beach Professionals who have more direct contact or experience with regulatory agencies express higher levels of concern about the Project.

*“I don’t see innovative technologies as part of the process...government agencies work with more traditional processes... and traditional infrastructure.”
– Beach Professional*

Litany of Technical Questions

- Many questions are raised about the geological properties and performance of the sand-glass mixture on the beach.
- Specifically, Beach Professionals want to know that the sand-glass mix will have the same characteristics of natural sand in terms of:
 - Grain size
 - Grain color
 - Grain angularity
 - Weight
 - Engineering functions
 - Wave action
 - Heat conductivity
 - Light absorption
 - Physical durability
 - Interaction with offshore sand, reefs, wildlife

“What are the suspension properties and compaction?” – Beach Professional

“Sand must have sides...” – Beach Professional

“We need to know that it won’t roll off the beach.” – Beach Professional

“What is the effect of wave action on the glass?” – Beach Professional

“How will the temperature change?” – Beach Professional

“Is it physically durable? Would it break down?” – Beach Professional

Support With Skepticism

- All in all, Beach Professionals believe that this Project is somewhat feasible, with feasibility contingent upon receiving more data and information about the performance of the sand-glass mixture on the beach.

“Assuming that all our questions have positive answers, I’d say it is feasible.” – Beach Professional



B. Tourism Representatives

Concerns Outweighed by Need to Provide Beautiful Beaches

- Tourism Representatives are more enthusiastic about the concept than Beach Professionals.
 - While they voice similar concerns to Beach Professionals, their concerns tend to be overshadowed by the potential benefits of the program.
 - Finding a viable solution to erosion on Broward's beaches is inexorably linked to the health of the tourism industry and their own livelihoods.

"You can't have a beach without sand." – Tourism Representative

- The number one objective of Tourism Representatives is to ascertain that the beaches of Broward County continue to exist and draw tourists. They believe the Beach Demonstration Project would help achieve this objective.

"A beach made of glass is better than no beach at all!" – Tourism Representative

"The bottom line is that we sell beaches. That's what our whole tourism industry is about in South Florida. So if we can come up with a solution that is environmentally sound, economically sound, with a better product out there on the beaches, I think this is a brilliant solution..." – Tourism Representative

Seeing is Believing

- Once Tourism Representatives examine the sand-glass mix sample, they are even more receptive to this solution for beach nourishment.
 - They unanimously agree that it looks and feels like natural sand.
 - The fact that it is made up of pulverized recycled glass (given that the product proves “eco-sound” and cost effective) does not matter to most, so long as promotes the retention of beautiful, sandy beaches in Broward County.

“When I first got here, I was very skeptical. I’m very impressed with this (sand-glass mixture)...Looking at it, it doesn’t matter if the sand is made up of tiny crushed shells or pulverized glass. It looks like a duck, feels like a duck, chances are it’s a duck.”
– Tourism Representative

“The only thing tourists don’t want on the beach is rain.” – Tourism Representative

Eco-tourism Provides Appealing Angle

- Tourism Representatives respond with particular enthusiasm to the notion of business working in concert with the environment.

*“It’s like eco-tourism. Making sure the environment is taken care of.”
– Tourism Representative*

- They believe that this Project “humanizes tourism” and helps to ensure the livelihood and future of the thousands of people who work in Broward’s tourism industry.

“No beach, no jobs...gotta think about all of the people employed in the tourism industry down here.” – Tourism Representative

Full Support Once Questions Addressed

- All in all, Tourism Representatives are very excited about this Project. Once their questions are addressed, they eagerly look forward to the Project reaching fruition and being implemented on their beaches.

“When can they get started?” – Tourism Representative

- Findings even indicate a willingness to pay for the sand-glass product or to participate in cost-sharing programs.

“I would be willing to pay for this on my beach...would help assure that I still have a beach for tourists to come visit.” – Tourism Representative

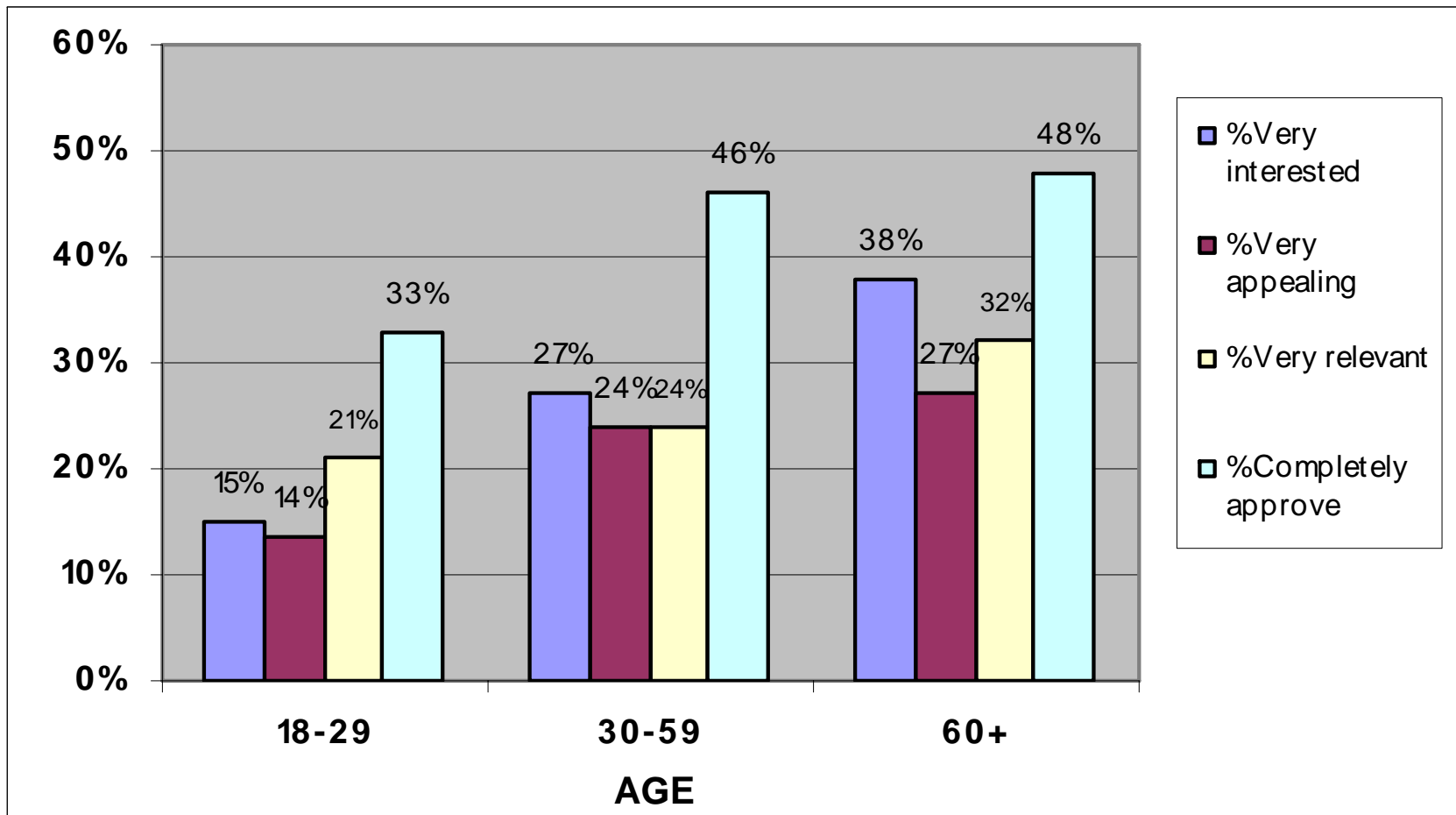


C. Broward County Residents

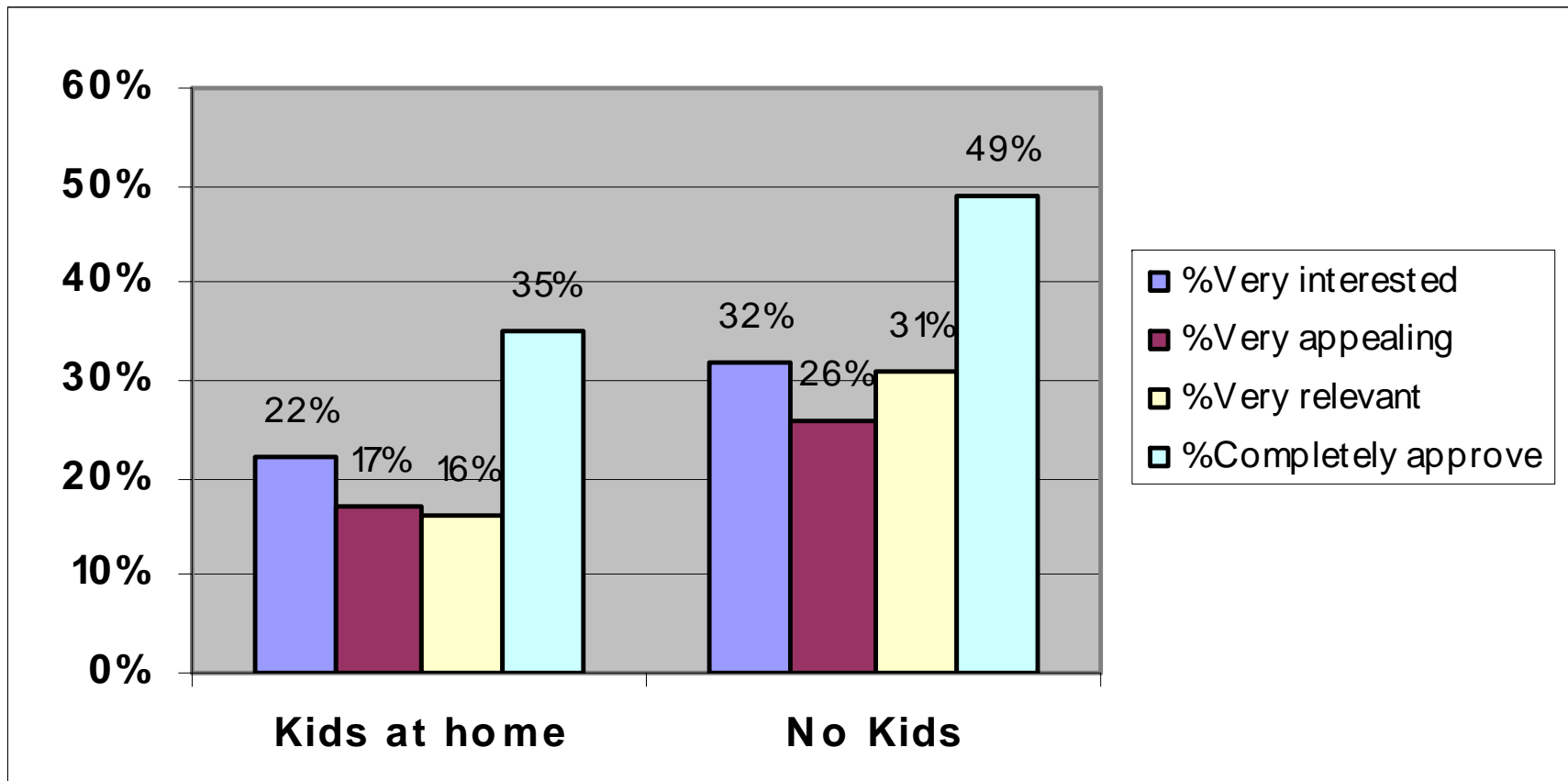
Variables Among Broward County Residents

- The following pages illustrate some differences in concept receptivity according to demographic and psychographic characteristics among Broward County residents.
- In general, respondents who meet the following characteristics tend to state greater interest, appeal, relevance, and/or approval of the concept:
 - Older in age (post 60 in particular)
 - ❖ *Likely explanation:* Also tend to be long-time Broward County residents, have more vested relationship in the community and have seen changes over time, especially in terms of Broward's beaches.
 - Do not have children living at home
 - ❖ *Likely explanation:* Those with kids at home likely have more concerns about the safety of the sand-glass mixture; also tend to be younger, perhaps not as invested or aware of issues in the community.
 - Live in closer residential proximity to the beach (under 10 miles)
 - ❖ *Likely explanation:* Beach is more integral part of their daily lives; live near beach for a reason; likely more concerned with its maintenance, look, and health.
 - Visit the beach more frequently (once a month or more)
 - ❖ *Likely explanation:* Similar to above. Active beach-goers, want to ascertain future sources of sand to enjoy as part of beach-related activities.
 - Have lived for longer periods of time in Broward County (20+ years)
 - ❖ *Likely explanation:* Tend to comprise large percentage of older age respondents. As above, more vested relationship in the community and the future preservation of a primary asset—its beaches.
 - Deem beach erosion to be a very important issue
 - ❖ *Likely explanation:* Clearly interested and concerned with issue of beach erosion. Likely more aware of problem here in Broward County and the need to find a viable solution to diminishing sources of sand.
 - Possess prior familiarity with the Beach Demonstration Project
 - ❖ *Likely explanation:* Interested enough in the issue to have been informed; perhaps possess more answers, information about questions raised by others in the general public.

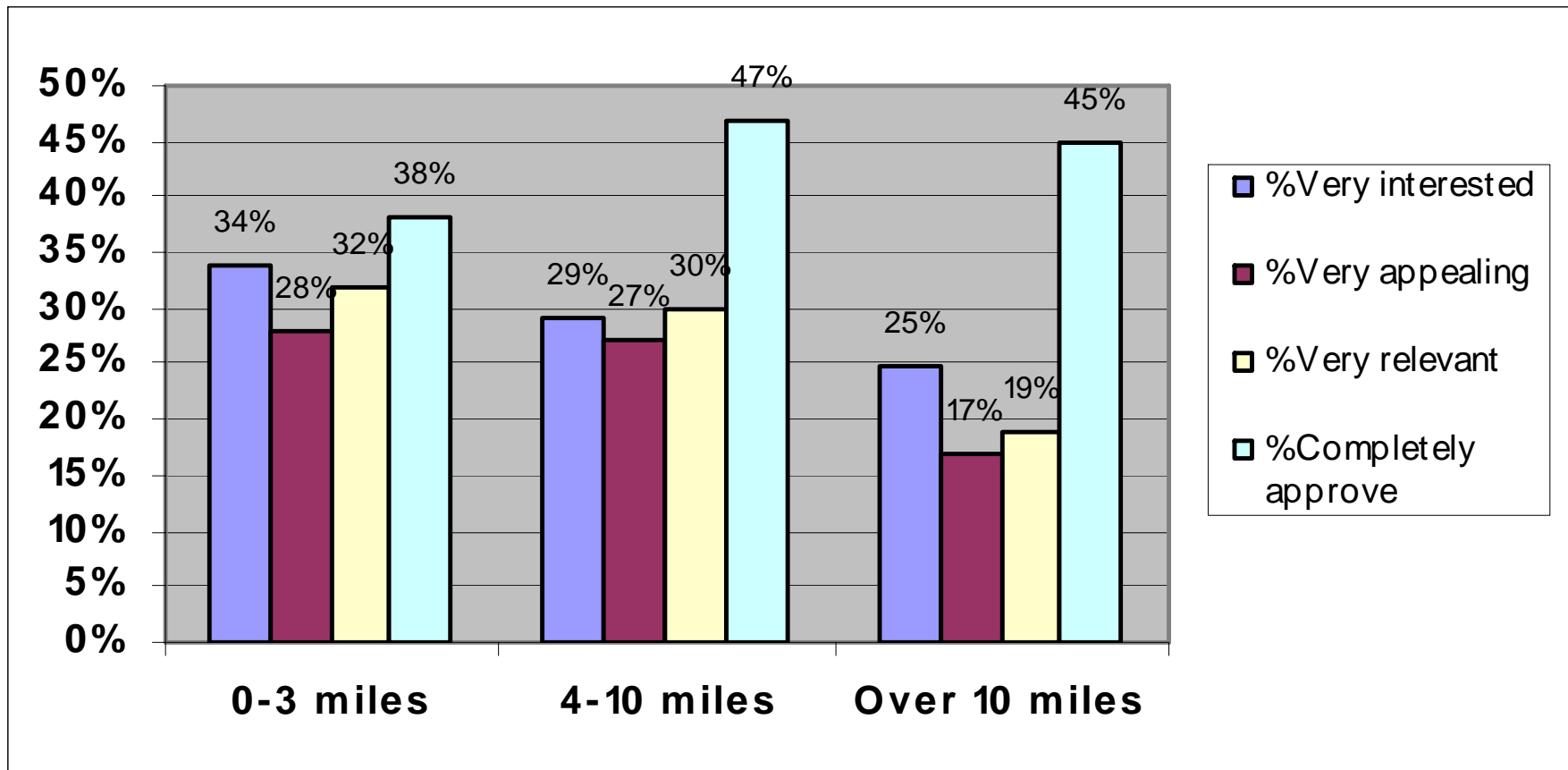
Older Age Correlates With Higher Interest, Appeal, Relevance, Approval



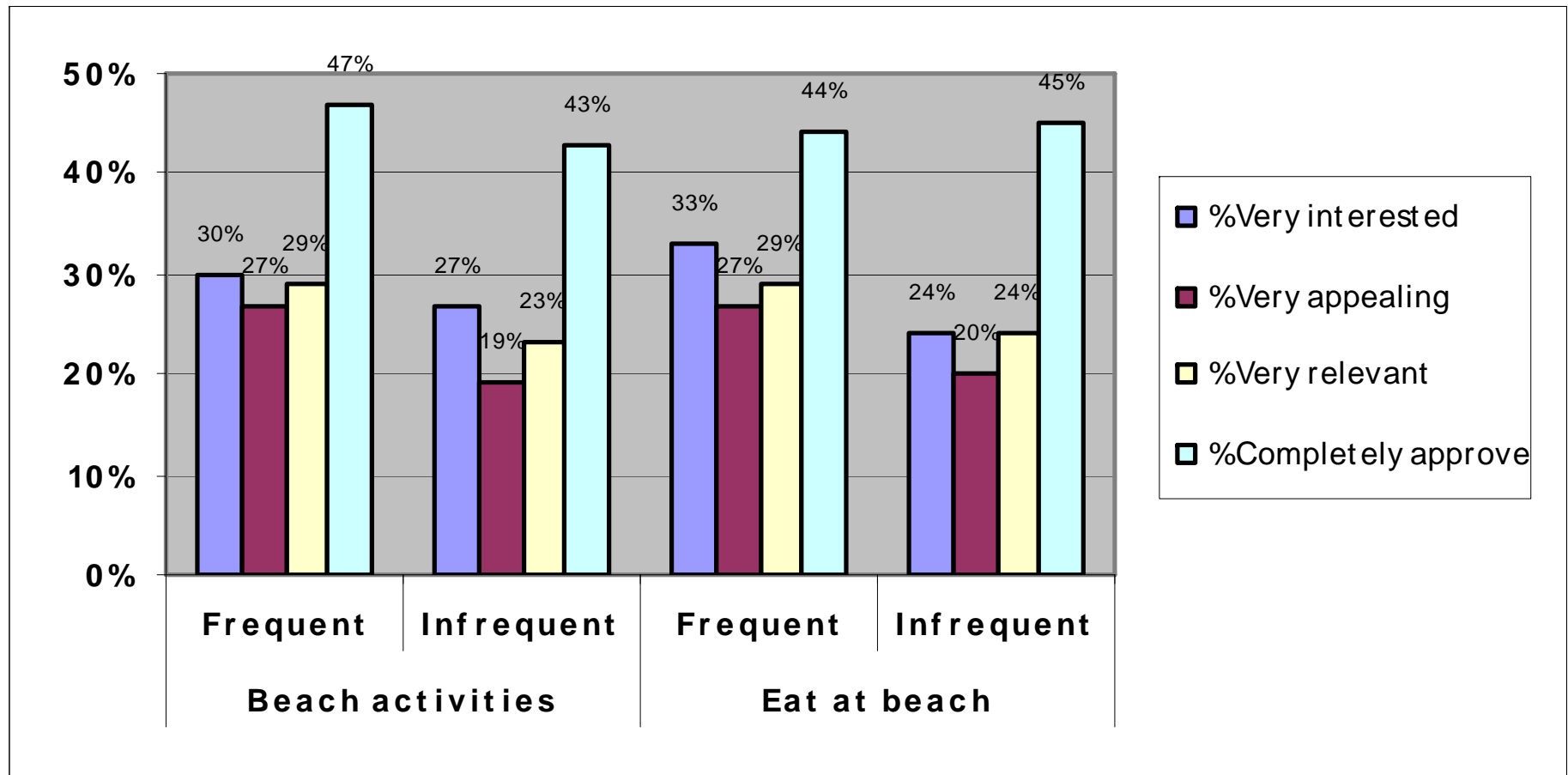
Families With Kids Slightly Lower Ratings



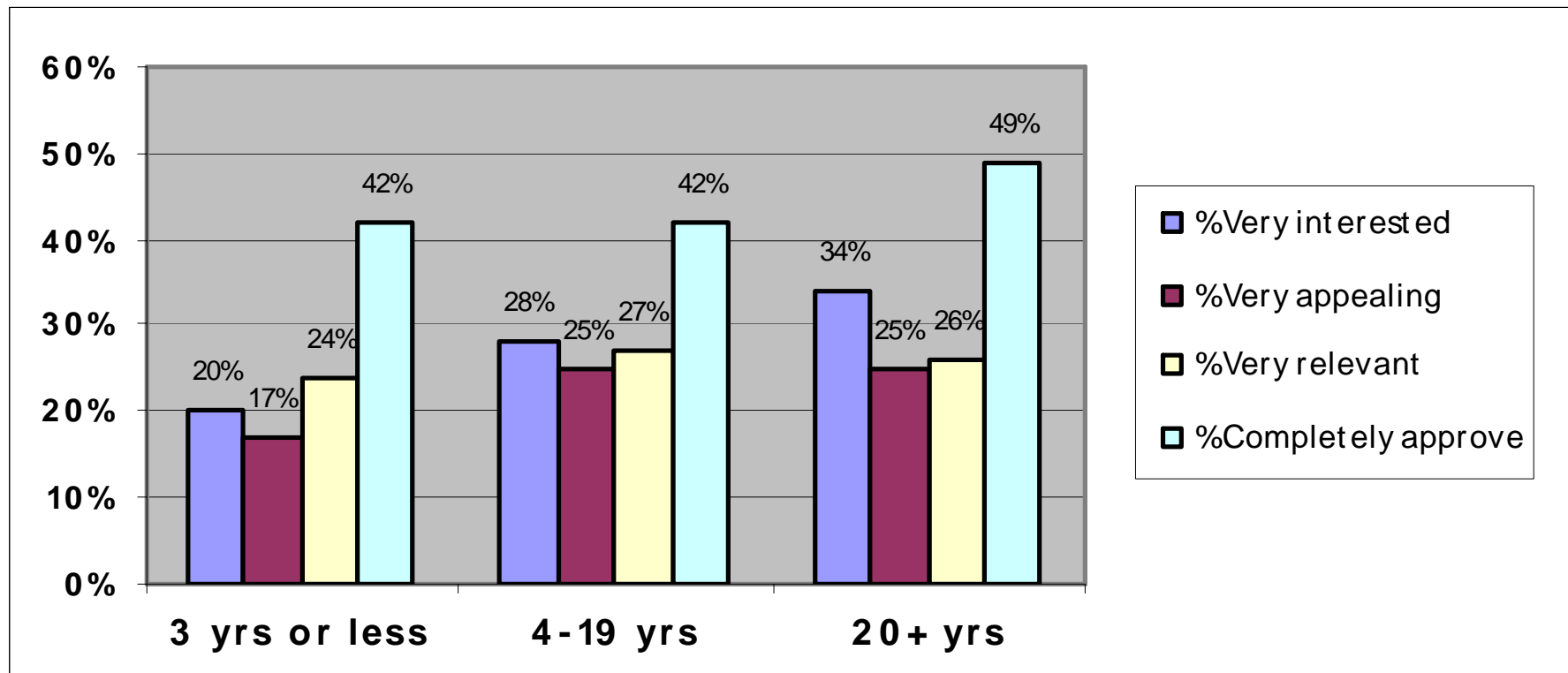
Residential Proximity to Beach Impacts Receptivity to Concept



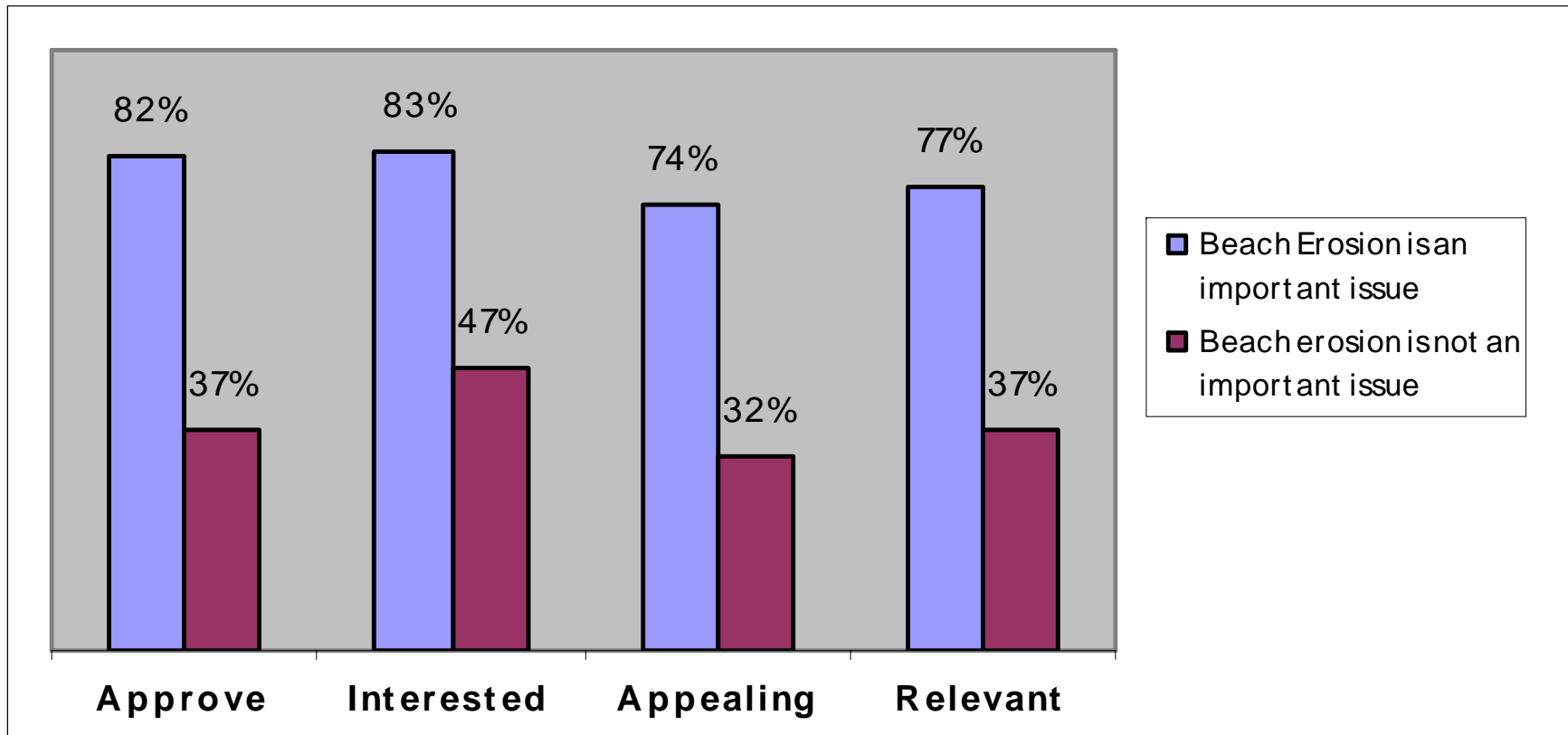
Beach Frequency Also Impacts Receptivity



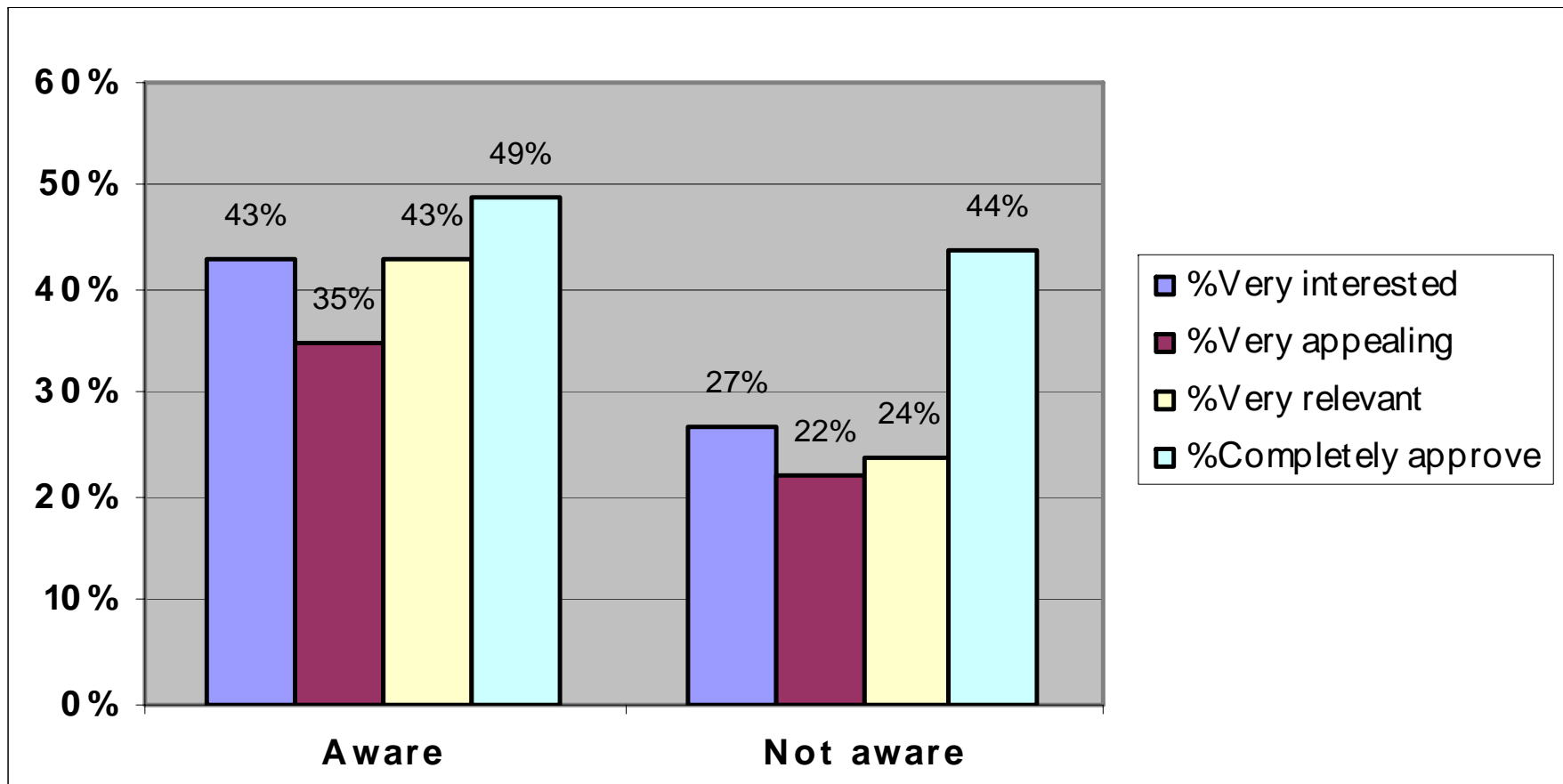
Longer Time as Broward County Resident Increases Interest



Those Who Agree Erosion is Important More Likely to Support Concept



If Prior Familiarity With Project, Higher Ratings for Concept





VI. Summary & Recommendations

Project is On the Right Track!

- Findings from the Public Perception Phase indicate that the Project as a whole is right on track. The questions being raised by all three audiences are ones being addressed in other phases of the Project.
- The public requires more information and hard evidence to prove the biological and geotechnical feasibility of the sand-glass mix product as well as its environmental compatibility on the beach.
- Concerns about public perception, particularly reactions to “glass” on the beach, are also tantamount to the public’s full approval and support of this Project.

Concept is Feasible, Move Forward

- Still, findings indicate that the concept of using recycled glass to re-nourish Broward County beaches is appealing and viable.
- Respondents from all three audiences are interested in the concept and particularly attracted to the positive application of using an overabundant recyclable material for treating beach erosion.
- Most feel that the concept is feasible; however, in order to be sure, they must have key concerns addressed and key questions answered.

But Provide Answers & Evidence

- It seems essential to develop and implement an educational program that will provide the information and evidence sought by the public.
- In framing an educational program, the following are key concerns to address:
 - Safety of using sand-glass mixture on the beach
 - Effect on the environment and wildlife
 - Cost of mixture and implementation
 - Impact upon public perceptions of Broward County's beaches
- While the above issues are relevant to all three public audiences, is it also important to consider some specific audience needs:
 - Beach Professionals are especially interested in learning about the geotechnical performance and the environmental compatibilities of the sand-glass mixture on the beach.
 - Tourism Representatives will need to understand how the sand-glass mixture affects the aesthetics of the beach as well as public perceptions of the beach (from the perspective of both residents and tourists).
 - Broward County residents should ideally hear about how this Project will benefit their County in terms of beach erosion and positive applications of erosion.
 - ❖ Addressing issues of cost is also likely a good idea in educating the residential public.
 - ❖ In addition, younger age residents, women, families with children, and those who live farther away from the beach indicate greater concerns than other types of residents and should be especially targeted in the educational program.

Ideal Next Step: Test Actual Sand-Glass Mixture With Public on the Beach

- The obvious way to provide this desired data and information is to pursue testing on the beach as planned.
- This testing should not only examine the actual geotechnical performance and environmental compatibility of the sand-glass mixture on the test patches, but should be used to gauge public perceptions to the actual product on the beach.
 - Findings from this research study show that respondents' perceptions of the concept improve once they tangibly interact with the sand-glass mixture.
- The structure of this testing should be in the form of beach intercepts with both local residents and tourists to solicit feedback about the look, feel, and acceptability of the sand-glass mixture in its natural environment.

Some Communications to Consider

- Findings clearly underscore the need to inform and educate the general public about this Project.
- However, in terms of communicating about the Project to tourists, findings suggest that “less is more.”
 - Most think that tourists will not know the difference between natural sand and the sand-glass mixture.
- Communications about the project should ideally emphasize the following messages:
 - Environmentally responsible
 - Eco-sound; eco-tourism
 - Economically feasible; potentially cheaper than current re-nourishment programs
 - Broward County has beautiful, re-nourished beaches
 - Win-win project, dual benefits of re-nourishing Broward’s beaches while finding a positive application for recycled glass, currently a waste material
 - Benefits Broward County at large
 - Healthy beaches promote healthy economy
 - Project will help to beautify and maintain beaches for residents they represent
 - Provides recycling solution for the County

Then, Best to Test Messages With Public

- Once educational concepts and messages have been developed, they should be tested with the public before implementation. The most effective way to do so is via concept/message testing focus groups with Broward County residents.

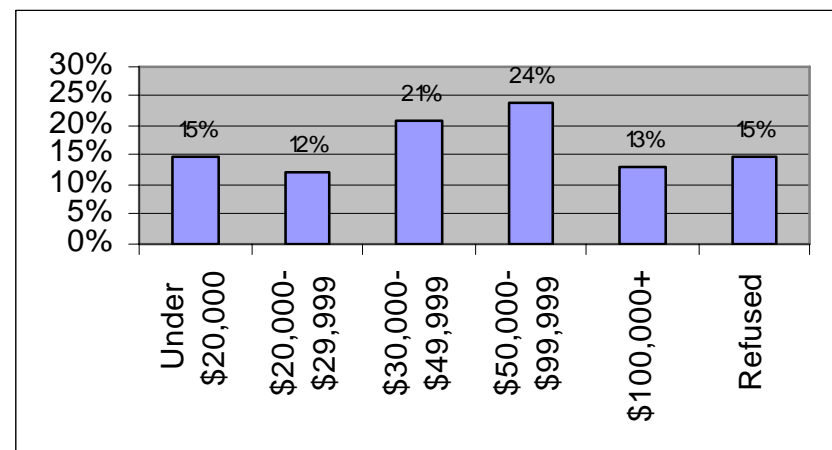
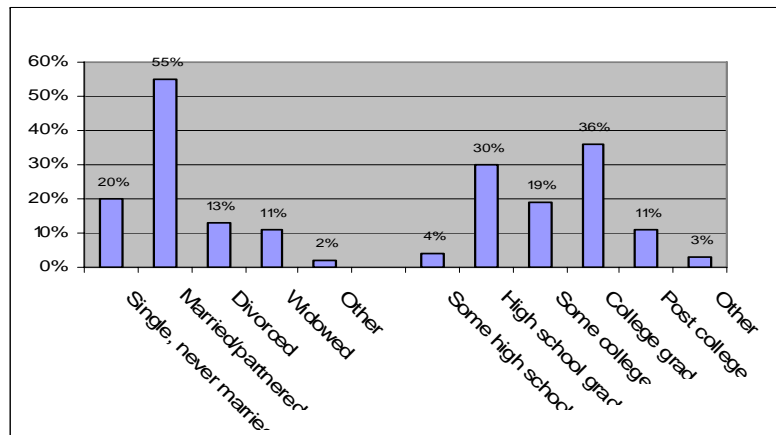
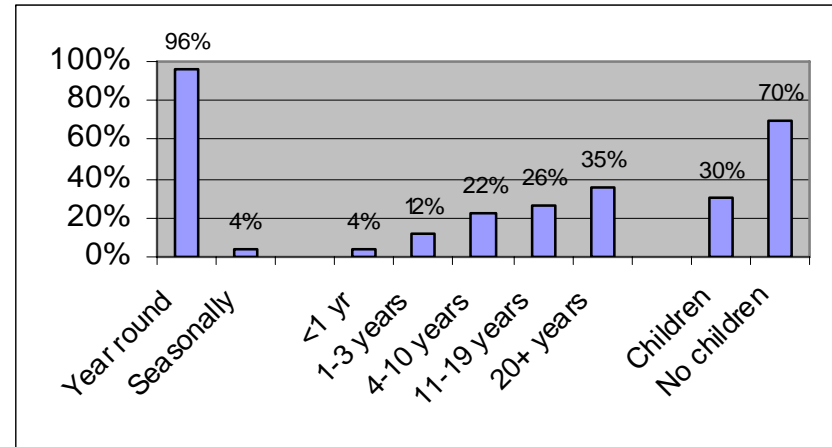
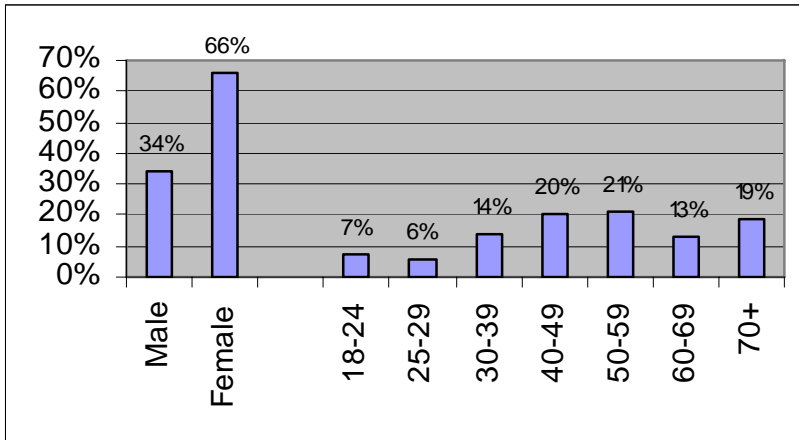
A blue-tinted photograph of a vast ocean under a cloudy sky. The text "VII. Appendices" is centered in white.

VII. Appendices

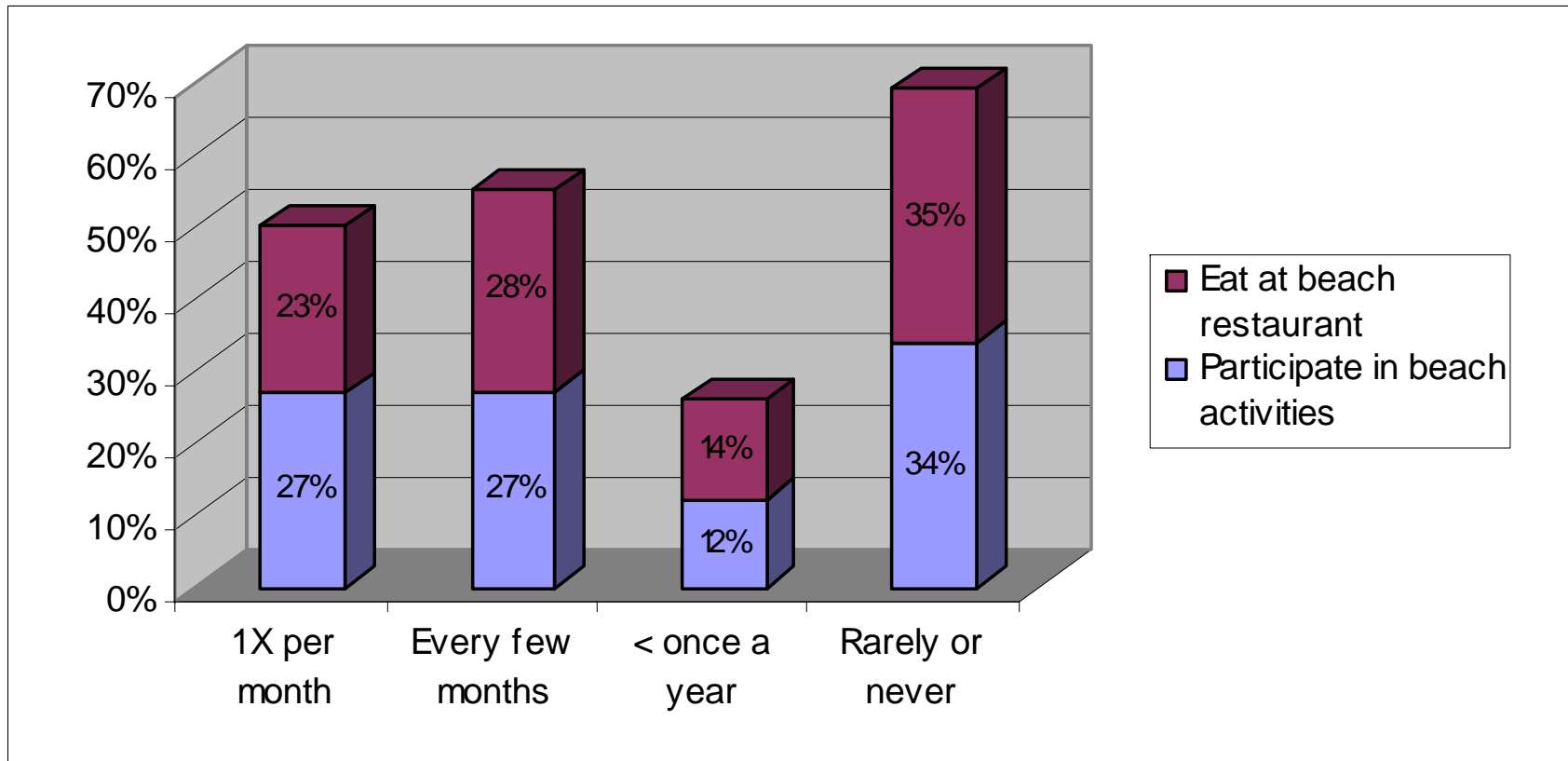
A blue-tinted photograph of a vast ocean under a cloudy sky. The text "A. Additional Charts" is centered in white.

A. Additional Charts

Demographics of Phone Survey



Frequency of Beach Activities





B. Concept Statements

Concept Statement Used in Beach Professionals Focus Group

- Broward County is in the beginning stages of studying the suitability of using pulverized recycled glass for beach nourishment and erosion control projects along Broward's beaches. The study will determine the technical, biological, regulatory and economic potential for using pulverized glass from the County's recycling programs to supplement existing beach nourishment programs.
- Broward County's beaches are currently in a chronic state of erosion and it is estimated that 21 miles of the 24 miles of Broward's beaches are critically eroded.
 - The County's current beach management program is proposing to replace 2.5 million cubic yards of sand over approximately 12 miles of beach.
- Glass is made from silica sand, limestone and soda ash. Quartz sand and glass are both comprised primarily of silicon dioxide, and thus share many basic physical characteristics.
 - Pulverized recycled glass also shares similar chemical, mechanical, engineering performance and geological properties of natural sand.
- The project could lead to the creation of a more sustainable and more cost effective way to utilize glass from the County's recycling programs.
 - The project may also create a more cost effective and more readily available supply of beach-fill material for "hot spot" applications.
 - This program will ascertain the effect of using pulverized glass to augment sand for beach fill on the variety of beach flora and fauna.
 - The beach, dune, and surf zone is host to a wide variety of plants and animals.
 - ❖ Beach and dune vegetation is habitat for a number of small animals.
 - ❖ Endangered and threatened sea turtles nest in the beach.
 - ❖ Shorebirds forage the beach for food, and may nest in the dune vegetation.
 - ❖ Micro- and macroscopic in-fauna in the sand provide food for fish, crabs, and birds.
- It is estimated that under Broward County's current beach nourishment program, the nourishment of the identified beaches could last approximately 10 years.
- However, beach nourishment continues to encounter several challenges, such as:
 - High implementation costs range from \$10 per cubic yard to \$20 per cubic yard of sand.
 - Environmental resistance occurs due to the potential adverse effects of beach nourishment on the near shore hard-bottom and sea turtle nesting areas.
 - Gaining economical access to sufficient quantities of sand.

Concept Statement Used in Tourism Representatives Focus Group

- Broward County is studying the suitability of using a blend of pulverized recycled glass and beach sand to supplement re-nourishment efforts on Broward's beaches.
 - The Broward County Beach Demonstration Project consists of 3 components, including the Public Perception Phase of which you are a part tonight.
- Glass is made from silica sand, limestone, and soda ash; hence pulverized recycled glass also shares similar chemical, mechanical, and geologic properties and engineering performance of natural sand.
 - The pulverized glass and sand mixture looks and feels like natural sand.
- The glass-sand mixture will be used to address beach erosion in Broward County.
- Some studies and uses pointing to the viability of this approach are:
 - An academic study on the use of glass for addressing erosional hotspots indicated possible benefits. (Charles Finkl, Loisa Kerwin. Florida Atlantic University, 1997).
 - An environmental consulting firm, Woodward-Clyde, conducted a feasibility study in 1993 to assess the use of recycled pulverized glass as beach sand. This study identified key issues such as cost, quality control, material supply, and physical and environmental considerations.
 - A hotel in Curacao is placing pulverized glass on the beach in front of the hotel to address erosion issues.
- It is estimated that 21 miles of the 24 miles of Broward's beaches are critically eroded.
- The current Broward County Beach Management Program proposes to place 2.5 million cubic yards of sand over approximately 12 miles of eroded beach, and to address future high erosion areas with more frequent, smaller infusions of compatible beach fill material.
 - Specifically, this current project will address "erosional hotspots", which are localized areas of higher erosion that contribute to an increased rate of erosion on the beaches.
 - Broward County recycles an average 13,000 tons of glass annually through its recycling plant.
- Due to poor market conditions, the cost for handling recycled glass is significant.
- The Broward County Beach Management Program provides a way to make use of this overabundant glass material to supplement sand placement on eroding beaches.

Concept Statement Used in Tourism Representatives Focus Group (cont.)

- The project could lead to the creation of a more sustainable and more cost effective way to utilize glass from the County's recycling programs.
 - It may also provide a cost effective and readily available supply of supplemental beach-fill material for "hot spot" applications.
- Broward County currently attracts 7.2 million visits a year, who spend \$422 million annually in Broward County.
 - They also contribute \$548 million annually to Broward County's economy and create 17,700 full-time equivalent jobs in the County.
 - More than 60% of overnight tourists said that they would not have come to Broward County if there were no beaches, and a further 14.3 percent said they would come less frequently.
 - Broward's beaches protect over \$4 billion in upland property, structures, and infrastructure.
 - As a result of Broward County beaches, local government tax revenues are increased by \$29 million annually, of which the largest beneficiary is the Broward School District, which collects about \$10 million annually.
- Economically accessible supplies of natural sand are dwindling, resulting in increased costs for beach nourishment.
 - Addressing hotspots in the short-term will reduce the long-term costs of beach nourishment. The glass-sand mixture may reduce the costs by increasing the time between beach nourishments.
 - Using recycled glass to supplement sand beach fill may be an economic alternative to acquiring sand from more remote locations.
 - Using recycled glass to supplement erosion control would improve the economics of recycling.

Concept Statement Used in Phone Survey

- Beach erosion along the Broward County coastline is a major concern. It is estimated that 21 of the 24 miles of Broward's beaches are affected.
- The current process of replacing beach sand from offshore sources costs the County an average of \$3.5 million per year.
- Glass is made from sand, and finely crushed glass from our recycling programs could potentially help combat beach erosion problems, as well as create stronger markets for recyclables.
- This glass/sand mixture will look and feel like natural sand.
- The County will study mixtures of sand and crushed glass and tests will determine the look, feel and environmental impacts of the material.



C. Phone Survey Questionnaire

Phone Survey Questionnaire

I am calling from Mars Research, a national public opinion research company, on behalf of Broward County regarding a new county wide program. The survey will take less than 10 minutes and your opinions are vital to the success of the research.

Are you a Broward County resident age 18 years or older?

Yes

No – THANK & TERMINATE

Which category best includes your age?

18 – 24

25 – 29

30 – 39

40 – 49

50 – 59

60 – 69

70+

RECORD GENDER:

Male

Female

How often do you visit the beaches in Broward County and participate in beach activities such as sunning, surfing, shelling or more? Would you say...

1 Once a month or more often

2 Every few months

3 A few times year

4 Less than once a year

5 Rarely or never

How often do you eat at a beachfront restaurant in Broward County?

1 Once a month or more often

2 Every few months

3 A few times year

4 Less than once a year

5 Rarely or never

How far do you live from the beach in Broward County?

1 I live directly on the beach

2 Less than 1 mile

3 1 mile but less than 3 miles

4 3 miles but less than 5 miles

5 5 miles but less than 10 miles

6 10 miles but less than 20 miles

7 20 miles or more



Phone Survey Questionnaire (cont.)

How much do you agree or disagree with the following statements? Please tell me if you completely agree, somewhat agree, neither agree nor disagree, somewhat disagree, or completely disagree with each. Let's start with...

Tourism is vital to the Broward County economy
Broward County beaches are an important part of the economy
Broward County would be better off without tourists
Recycling is important to me
Beach erosion is an important issue
Government should spend money to protect the beaches from erosion
Finding a way to use recycled glass material would be beneficial
The way the beach looks with lots of sand is an important factor of a beach

Broward County is in the process of implementing a beach nourishment program. I am going to read you information about the project and then ask you some specific questions about it. READ CONCEPT

[INSERT CONCEPT HERE]

What is the first thing that comes to mind when you heard this concept? PROBE FOR COMPLETENESS

How appealing is this concept to you? Would you say...

Very appealing
Somewhat appealing
Neither appealing nor unappealing
Somewhat unappealing
Very unappealing

Where you aware of this program before I told you about it today?

Yes
No

Phone Survey Questionnaire (cont.)

I am going to read you list of concerns that residents might have with this sand/glass mixture. After I read the list, please tell me which one concerns you the most. READ EACH & ROTATE

The way the glass/sand mixture looks

The way the glass/sand mixture feels

The cost of mixing and laying the glass/sand mixture

The effects on the environment

How important do you think it would be to make Broward County RESIDENTS aware of this program? Would you say?

Very important

Somewhat important

Neither important nor unimportant

Somewhat unimportant

Very unimportant

How important do you think it would be to make Broward County TOURISTS aware of this program before they visit the area? Would you say?

Very important

Somewhat important

Neither important nor unimportant

Somewhat unimportant

Very unimportant

Phone Survey Questionnaire (cont.)

I have a few final questions for classification purposes only

How long have you been a Broward County resident?

- Less than 1 year
- 1 to 3 years
- 4 to 10 years
- 11 to 20 years
- 20 or more years

Do you have any children living at home under the age of 18?

- Yes
- No

What is your marital status?

- Single never married
- Married or living with a partner
- Divorced
- Widowed
- Other

What was the last grade of school you completed?

- Some high school or less
- High school graduate
- Some college
- College graduate
- Post college work or degree
- Trade school
- Other

Which category best includes your annual household income?

- Under \$15,000
- \$15,000 but less than \$20,000
- \$20,000 but less than \$30,000
- \$30,000 but less than \$50,000
- \$50,000 but less than \$100,000
- \$100,000 or more



D. Types of Focus Group Participants

General Affiliations: Beach Professionals

1. Self-employed engineering consultant
2. Coastal engineer for a Florida County
3. Member of local beach organization
4. Marine biologist in private sector
5. President of coastal technology company
6. Coastal geologist for regulatory agency
7. Natural resource manager for a Florida County
8. Engineering Assistant for a Florida County
9. Navigator planner for a regulatory agency

General Affiliations: Tourism Representatives

1. General manager of local hotel
2. Management level position in local tourism organization
3. Promotions coordinator for local chamber of commerce
4. Sales & marketing for local hotel
5. President of local chamber of commerce
6. General manager of local hotel
7. Owner of local hotel
8. Sales & marketing for local hotel