

SafeSail – Intelligent Marine Conditions & Decision-Support Platform

SafeSail is a full-stack, AI-assisted mobile application designed to help boat owners, sailors, surfers, and sea-goers make safer and smarter decisions before going out to sea.

The core goal of the system is to transform complex marine and weather data into a clear, actionable recommendation — answering a simple but critical question:

“Is it a good day to go out to sea for my specific vessel type?”

SafeSail combines real-time marine data, atmospheric weather forecasts, vessel-specific safety rules, time-based sea condition insights.

Key Product Capabilities

Intelligent Sea Condition Scoring

Each time window receives a composite sea condition score.

Scores are calculated using:

Wind speed & gusts

Wave height & wave period

Swell height, direction, and period

Rain, pressure, visibility, and temperature

The score is mapped to a clear recommendation:

Not Recommended

Moderate

Recommended

Sea condition scoring is dynamically adjusted by location and vessel type, ensuring that forecasts reflect local marine characteristics and the operational limits of:

Speed boats

Sailboats

Surfboards

Kayaks

Personal watercraft

Time-Based Forecasting UX

SafeSail presents forecasts in two complementary layers:

1. Daily Overview

Morning / Noon / Evening large time blocks

Instant “go / no-go” understanding for the entire day

Highlights the best time window automatically

2. Detailed Intraday Breakdown

3-hour timeframes (e.g. 06–09, 09–12)

Per-timeframe condition score

Detailed wind, wave, and swell values

Visual trend graphs for wind and wave height

Personalized Experience

Users select a preferred beach/location

Users choose a vessel type, which directly affects scoring logic

All recommendations adapt automatically to user preferences

Internationalization & RTL/LTR Support

Full bilingual support for Hebrew and English

Automatic RTL / LTR layout switching based on selected language

Localized text, navigation flow, icons, charts, and alignment

Designed to feel native in both left-to-right and right-to-left environments

This signals:

UX maturity

Global readiness

Attention to detail beyond “just translating strings”

Smart Notifications

Background jobs analyze forecasts daily

Users receive notifications when:

Their preferred beach has ideal conditions

Conditions align with their vessel's optimal ranges

Full Authentication & User Management

SafeSail includes a production-grade authentication system:

User Authentication

Secure login using Firebase Authentication

Token-based authorization between frontend and backend

Protected API access per user

User Profiles

Preferred beach

Vessel type

Notification preferences

Device metadata for push notifications

Admin Dashboard & Internal Tools

SafeSail includes internal admin capabilities, built for maintainability and future scaling:

Admin Dashboard

Manage beaches (coordinates, regions, activation)

Manage vessel types and scoring thresholds

Inspect forecast data per location and timeframe

Review scoring outputs

Backend Architecture

The backend is designed for scalability, clarity, and automation.

Data Ingestion Pipeline

Scheduled cron jobs:

Fetch marine data from StormGlass

Fetch atmospheric data from WeatherAPI

Data is normalized and merged into a unified forecast model

Timeframes and daily blocks are generated automatically

AI-Assisted Scoring System

Scoring is rule-based and explainable

Vessel-specific optimal ranges are defined in structured tables

Deviations are penalized consistently

The system produces deterministic, transparent results

This approach ensures:

Trustworthiness

Predictability

Safety-first decision making

Technology Stack

Frontend

React Native (Expo)

TypeScript

Modern component-based UI

Optimized for outdoor / marine use cases

Charts and visual indicators for quick readability

Backend

Node.js

Firebase Firestore

Firebase Authentication

Cloud Functions / Scheduled Jobs

APIs

StormGlass (marine conditions)

WeatherAPI (atmospheric conditions)

DevOps & Tooling

Expo EAS build system

TestFlight & Google Play Console pipelines

Environment-based configuration

Production logging and monitoring

Why This Project Matters

SafeSail is not just a weather app — it is a decision-support system.

It demonstrates:

Full-stack ownership from UX to data pipelines

Real-world API integration challenges

Scalable backend design

Deterministic AI logic for safety-critical domains

Product thinking beyond “just code”

This project reflects my ability to:

Design and build end-to-end systems

Translate real-world problems into scalable software

Combine UX, backend architecture, data modeling, and automation

Own a product from idea → production → app store review

SafeSail represents how I approach software: clear intent, strong architecture, and real user value.