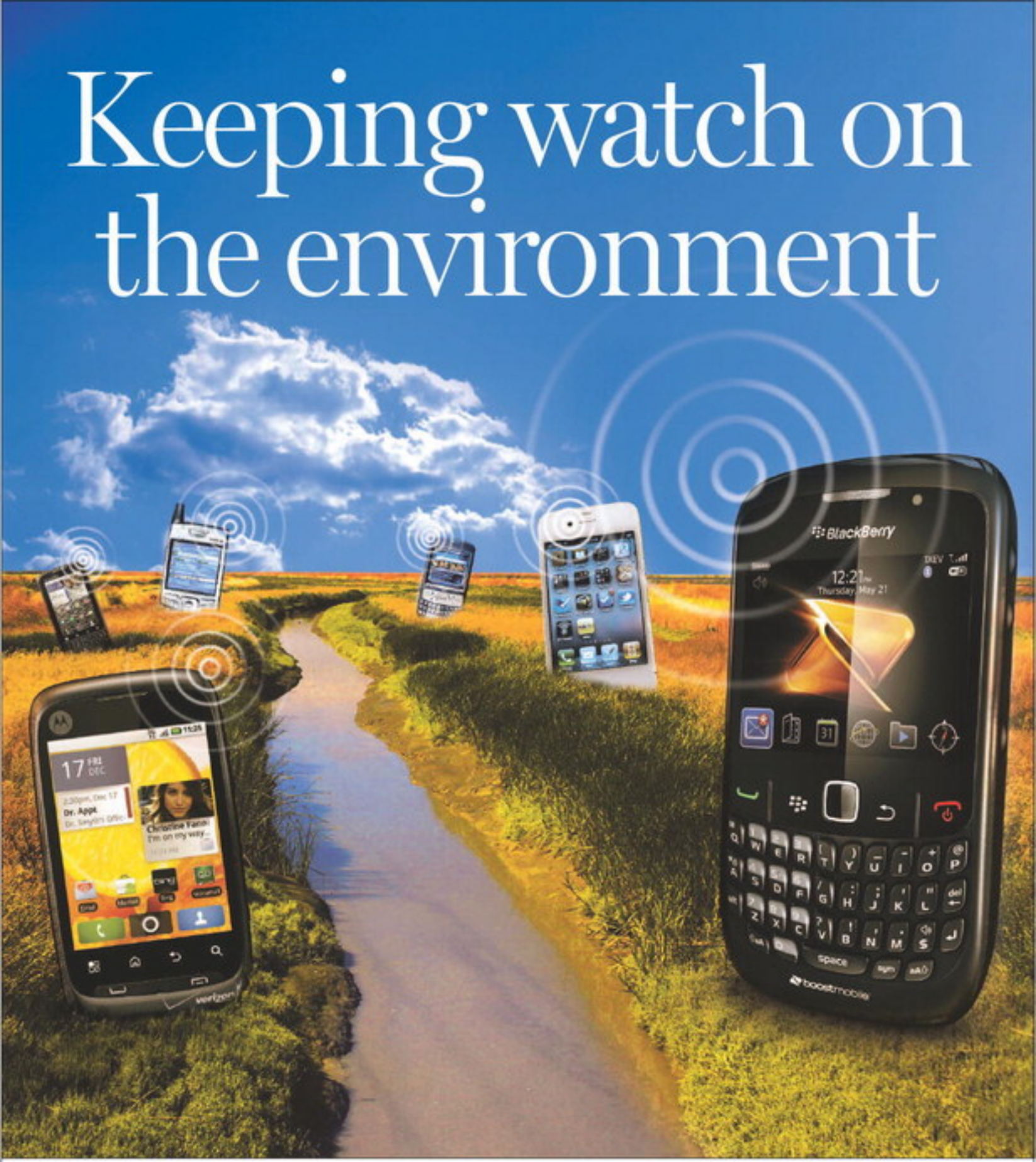
Keeping watch on the environment



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Smartphones used to gather data about San Jose's urban streams

By Brandon Bailey
bbailey@mercurynews.com

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Local environmental officials are hoping an army of volunteer creek watchers will start downloading a new smartphone program sometime in the next few weeks that will help them track water levels, trash and other conditions along San Jose's urban streams.

"It gets a lot more eyes out into the watershed," said James Downing, an environmental services specialist for the city, who recently tested the new Creek Watch application developed by researchers at IBM's Almaden Lab.

IBM computer scientists created the app as a project to study how mobile phones can be used to gather and share information -- a growing field of interest for many corporate and academic researchers. In a reverse of the current craze for "location-based" programs, which deliver personalized information to users' phones based on their whereabouts, the idea is that smartphones can be valuable tools for collecting isolated bits of data and assembling them into a larger picture.

Scientists and environmental activists have used similar apps to monitor the spread of spilled oil in the Gulf of Mexico, measure noise pollution in Paris and report sightings of cassowaries, large flightless birds that live in Australia.

In a slightly different approach, scientists at the Department of Homeland Security say they hope to develop an inexpensive sensor that could turn millions of phones into passive detectors of deadly chemicals, capable of sounding an alarm and notifying

authorities in case of accidental leak or terrorist attack.

Most smartphones are already equipped with several sensing devices, including GPS locators, gyroscopes and digital cameras, which can be used to collect information about their physical surroundings, said Jeff Pierce, who leads the mobile computing research team at IBM's Almaden facility. Pierce and IBM computer scientist Christine Robson developed the "Creek Watch" app with input from Downing and his co-workers.

The app is a downloadable program for iPhones that lets users answer a few questions, snap a photo and submit a standardized report to a website (www.creekwatch.org) that compiles the data into tables and maps, which authorities can use to spot trends or problem areas in need of cleanup. The app uses the phone's GPS system to tie each report to a specific location.

Local officials believe the relative simplicity of the app could help attract volunteers -- such as students or members of scouting groups and service clubs -- for the otherwise daunting task of monitoring miles and miles of streams and water channels.

"It's a relatively easy thing that someone can do for the environment," said Carol Boland,

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a watershed biologist with San Jose's Department of Environmental Services, which deals with environmental regulations governing trash and toxic dumping in the stormwater runoff system.

(JIM GENSHEIMER/MERCURY NEWS ARCHIVES; DAYMOND GASCON/MERCURY NEWS ILLUSTRATION)

Along with harm to water quality, officials say trash in urban creeks can interfere with fish migration and spawning, and also cause flooding if the water flow is blocked.

Downing, who works with Boland, took his 10-year-old along for a recent test of the app. They hit five spots along local creeks in an hour, as his son quickly got the hang of filing a report from each location.

For IBM, the Creek Watch project is part of a broader research effort to explore how people interact with mobile gadgets and how phones might be used as information-gathering tools. A spokeswoman said similar programs could help motorists report potholes to their local road department, or assist scientists in gathering climate measurements.

While the Creek Watch app is not intended to be a commercial product, IBM is one of several tech companies developing new ways to gather and analyze data from sensors scattered across the natural and man-made environment. Hewlett-Packard, for example, is working with oil companies to map petroleum deposits by using a network of highly sensitive motion detectors.

The "near ubiquity" of mobile phones could help create "a wealth of data," according to a report from the consulting firm IMS Research, which added: "The idea of millions of sensors reporting data to a central location for analysis has obvious benefits to a number of industries."

Many experts have suggested that smartphone data could be used by commercial services to provide real-time reports on local traffic or weather to subscribers. But the biggest hurdle, added IMS Research analyst Bill Morelli, is the need for "critical mass," or enough phones equipped with the right sensors or software.

IBM has submitted the Creek Watch program for inclusion in the iPhone App Store, where users can already find Oil Reporter, a similar app developed for volunteers to report sightings of spreading slicks in the Gulf of Mexico. Programmers at software maker Intridea built an iPhone and Android version of Oil Reporter with tools from Mountain View's Appcelerator.

It takes more effort to use "NoiseTube," an app that

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researchers at the Sony Computer Science Lab in Paris created to measure ambient noise with certain Java-enabled phones. Downloading the app from w-ww.noisetube.net requires a few steps, although the sponsors say they hope to develop an iPhone and Android version.

The Department of Homeland Security, meanwhile, is exploring a more passive approach to data collection.

Department officials recently announced they're in preliminary talks with several phone makers about equipping handsets with a tiny sensor similar to the carbon monoxide detectors now sold for home use. Rather than require any action by the user, federal scientists envision a system that would sound an alarm and automatically notify authorities when a toxic substance is present.

For biologist Boland, however, user involvement is an added benefit. She hopes the Creek Watch app will encourage users to "connect at a personal level" with their neighborhood creeks.

"A really big benefit," she added, "would be making people more interested in being a steward of their watershed."

Contact Brandon Bailey at 408-920-5022; follow him at Twitter.com/BrandonBailey.