

Sistem vodostajnih mernih stanica

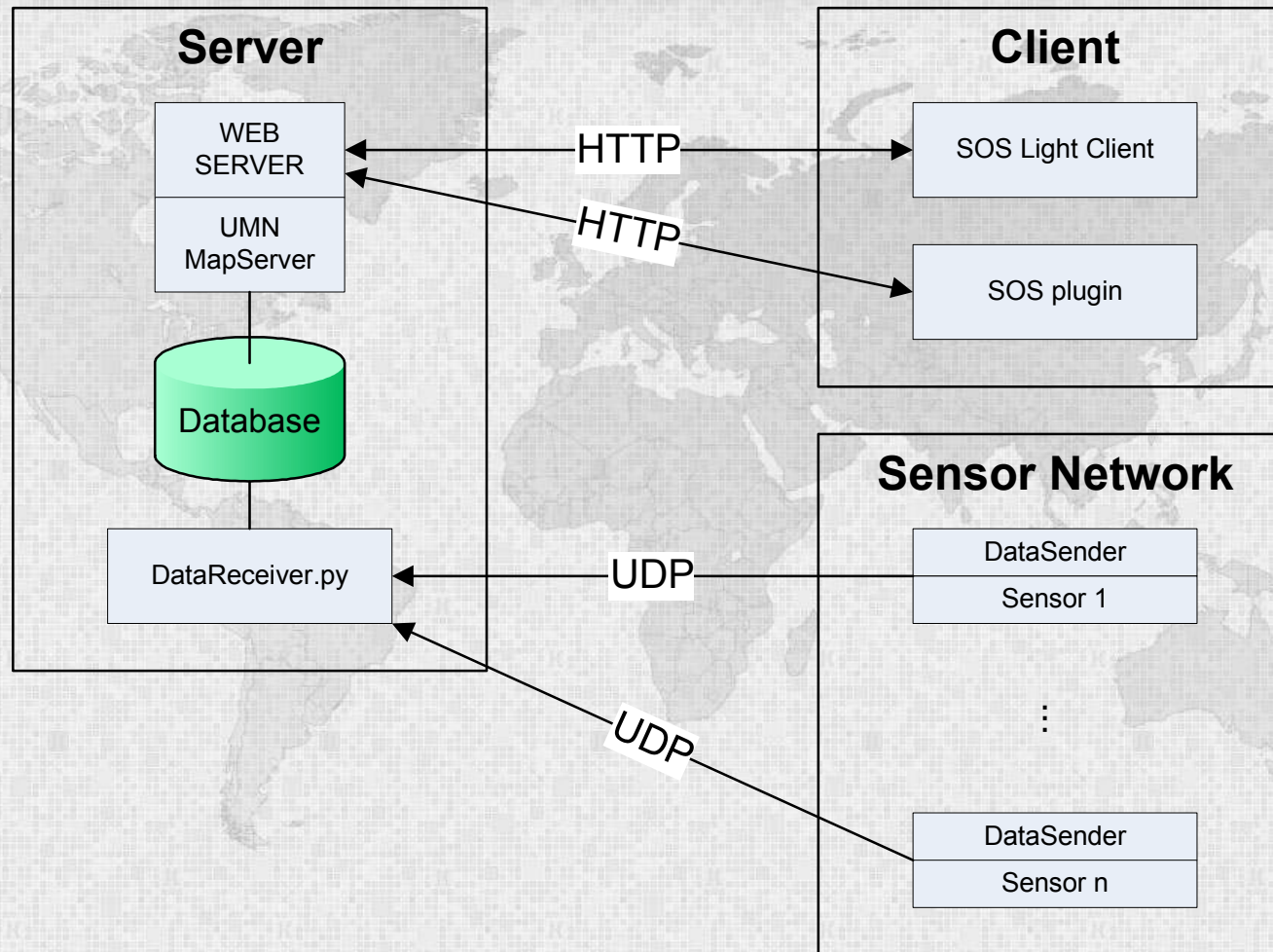
FTN Novi Sad, departman za
građevinarstvo i geodeziju, katedra za
hidrotehniku i geodeziju



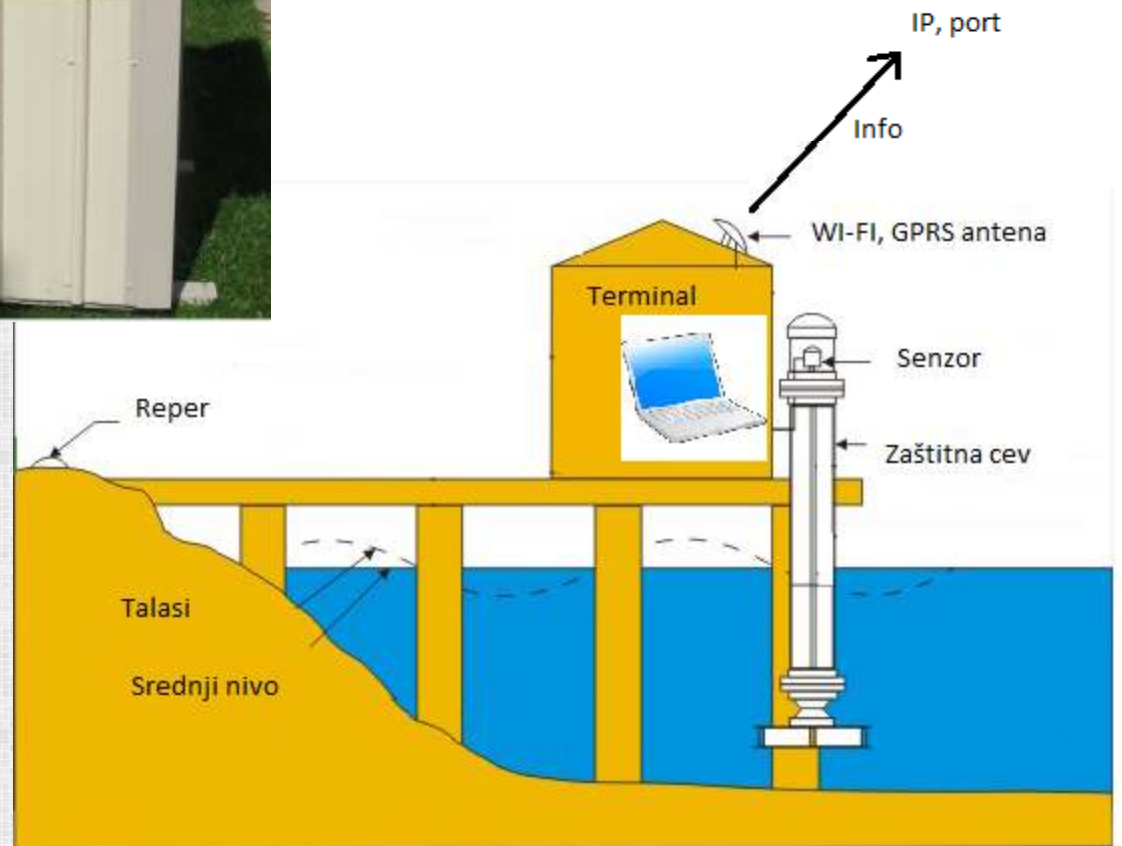
Sistemske zahteve

- Merenja do 10 puta u sekundi
- Pristup 24/7
- Tačnost od 1mm
- Raspon merenja i do 6m
- Slanje rezultata na udaljeni server preko UDP protokola u realnom vremenu
- Skladištenje u bazi podataka
- Podrška za OGC SOS servis na serveru
- Pristup preko web interfejsa neograničenom broju korisnika (PC, Android,...)
- Low-cost

Arhitektura sistema



Merna stanica

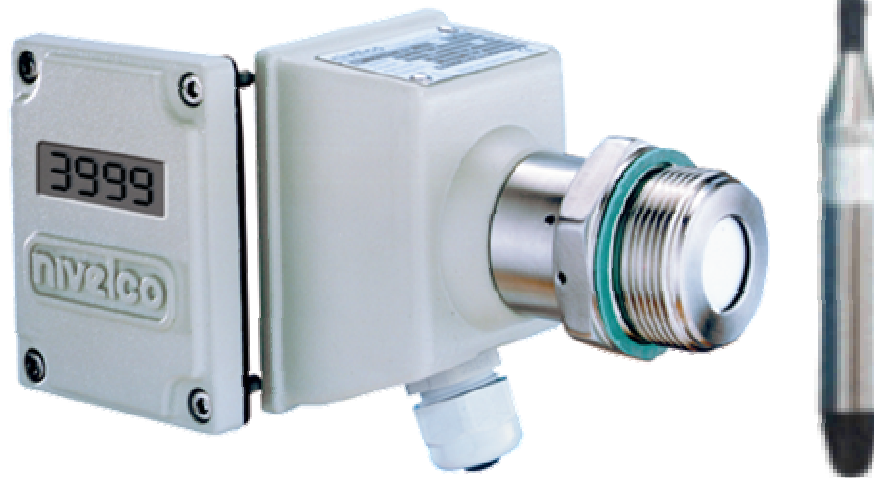


Metode merenja

- Hidrostatski senzori,
- Senzori na principu promene otpornosti, kapacitivnosti ili indukovanosti, tačnost bolja od 1cm,
- Ultrazvučni, infracrveni ili senzori radio talasa,
- Senzori na principu plovka.

Hidrostatski senzor

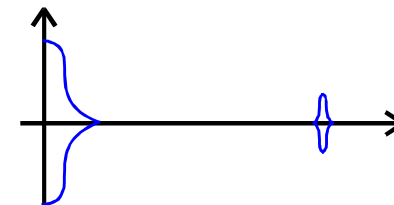
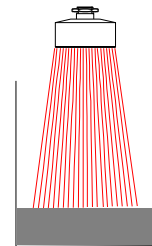
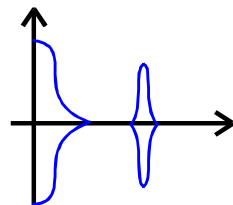
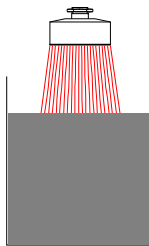
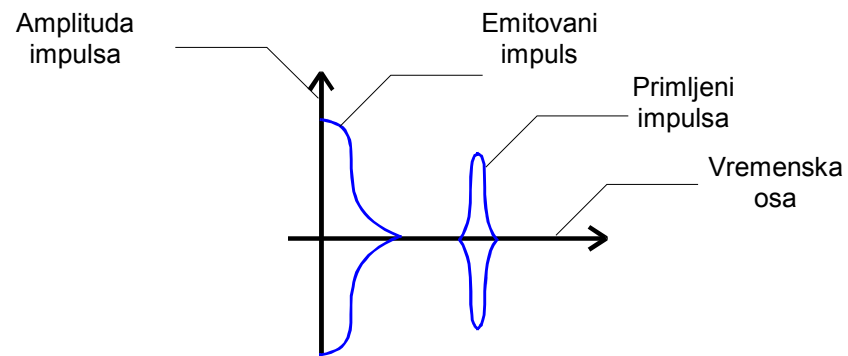
Princip promene hidrostatičkog pritiska



RLC



Ultrazvučni senzori



Princip merenja inklinometrom

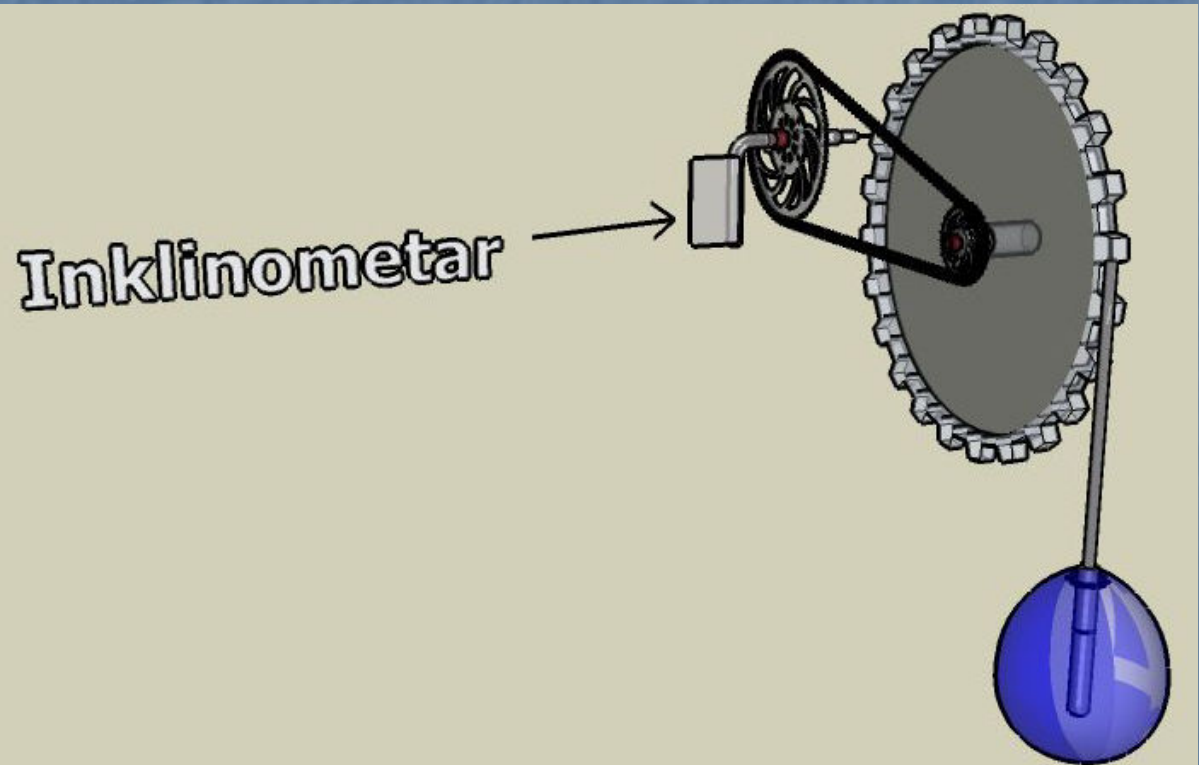
Konvertovanje nivoa u nagib

$$H = a_0 + a_1 * U$$

H – apsolutna/relativna kota vode

U – nagib

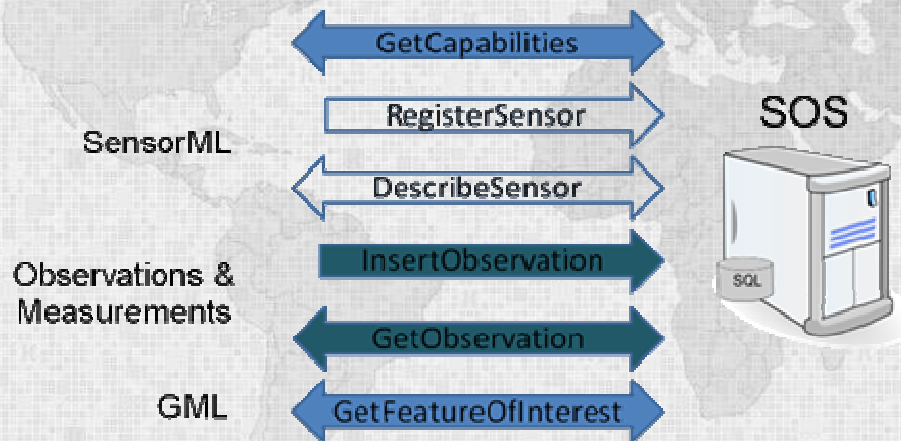
a_0, a_1 – koeficijenti kalibracije



OGC Sensor Observation Service & Sensor Alert Service

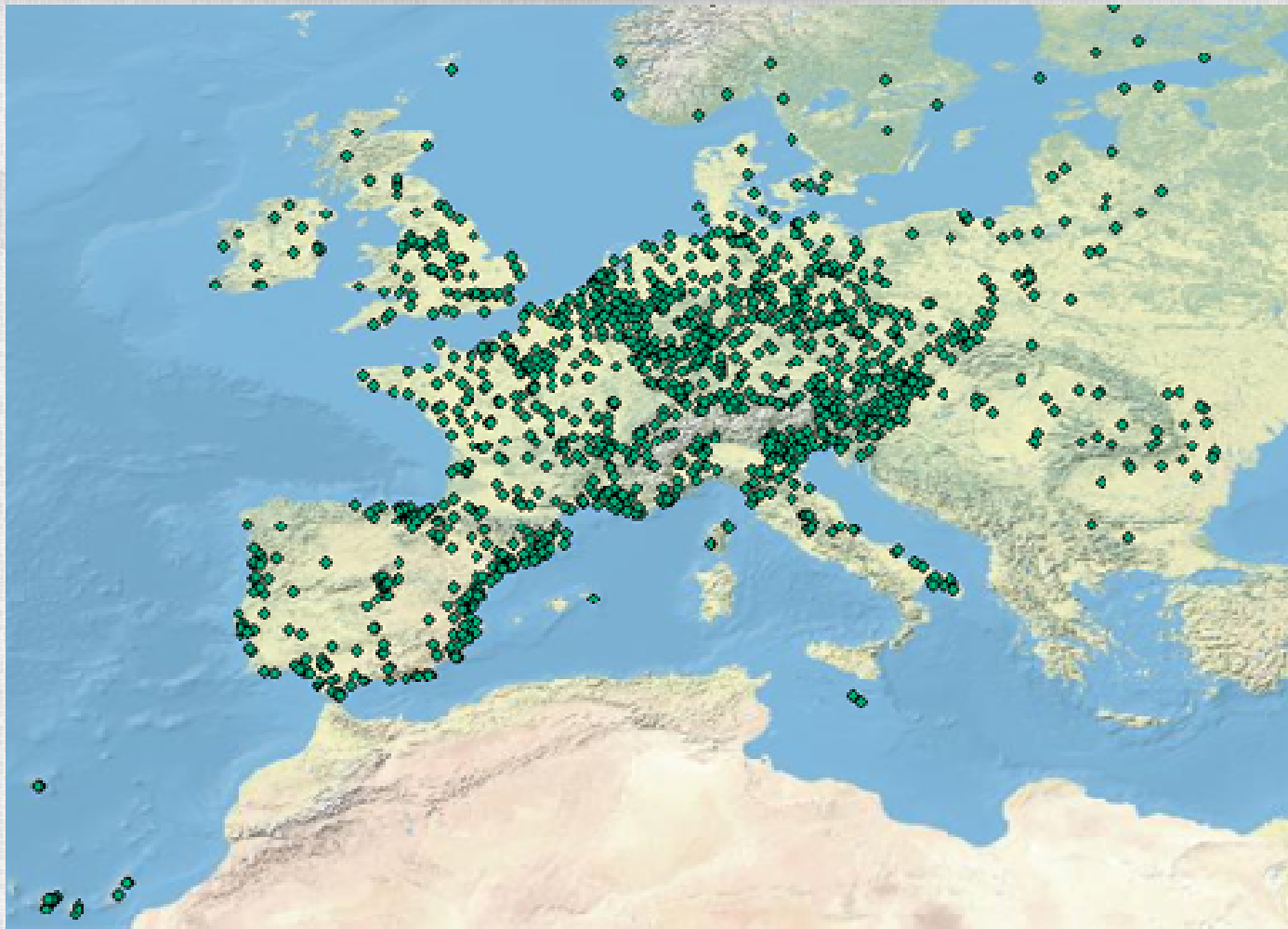
Pristup sistemu od više senzora – SOS

- Informacije o dostupnim sensorima – **GetCapabilities**
- Informacije o konkretnom senzoru – **DescribeSensor**
- Rezultati merenja – **GetObservation**



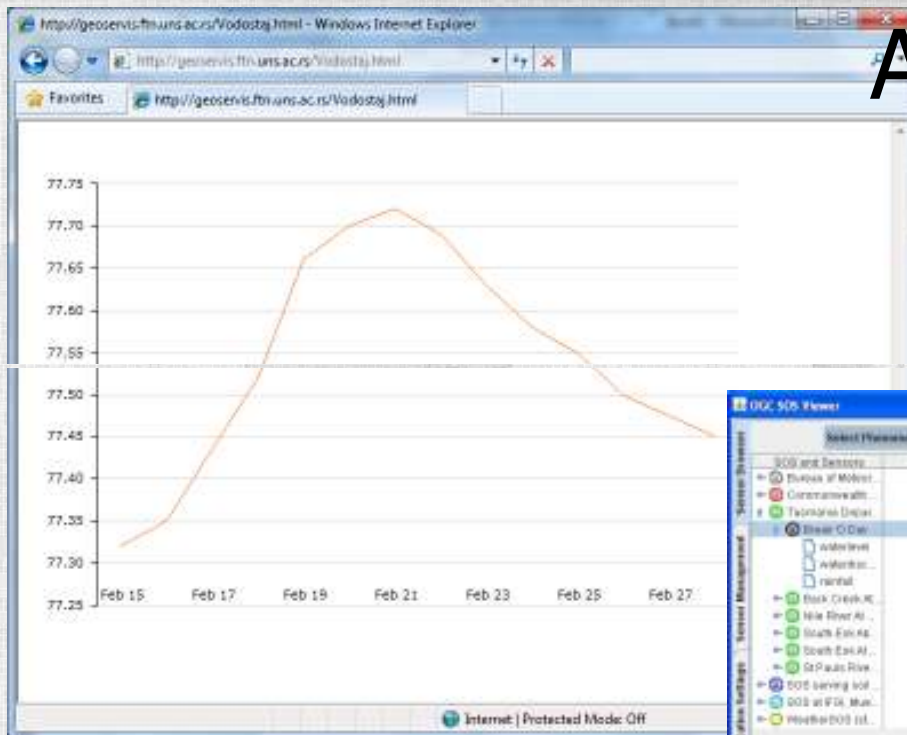
Slanje upozorenje prema zadatim kriterijumima – SAS

Sistem OGC SOS senzora

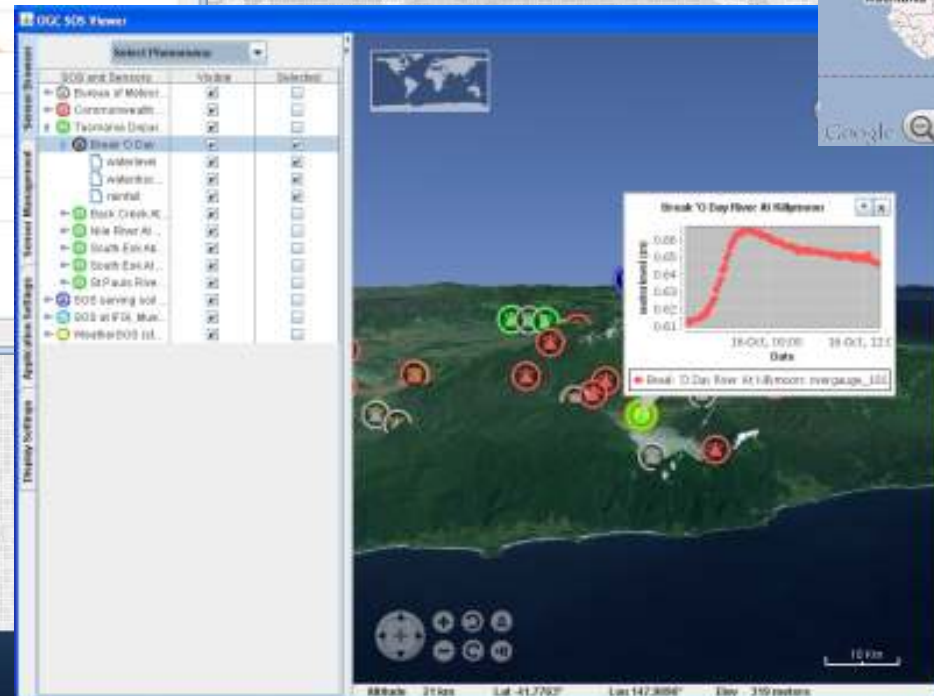


Korisnički interfejs javni/privatni pristup

ArcGIS, uDig SOS plugin

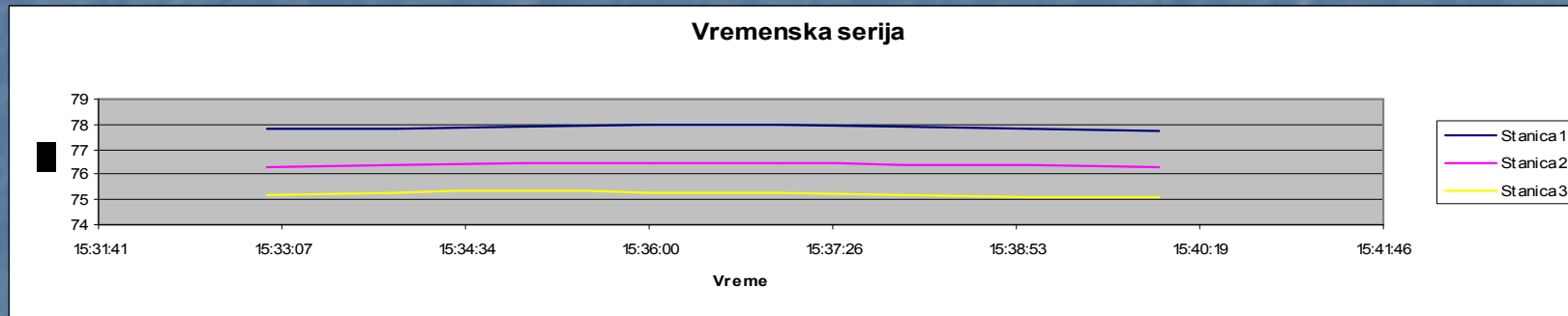


web browser

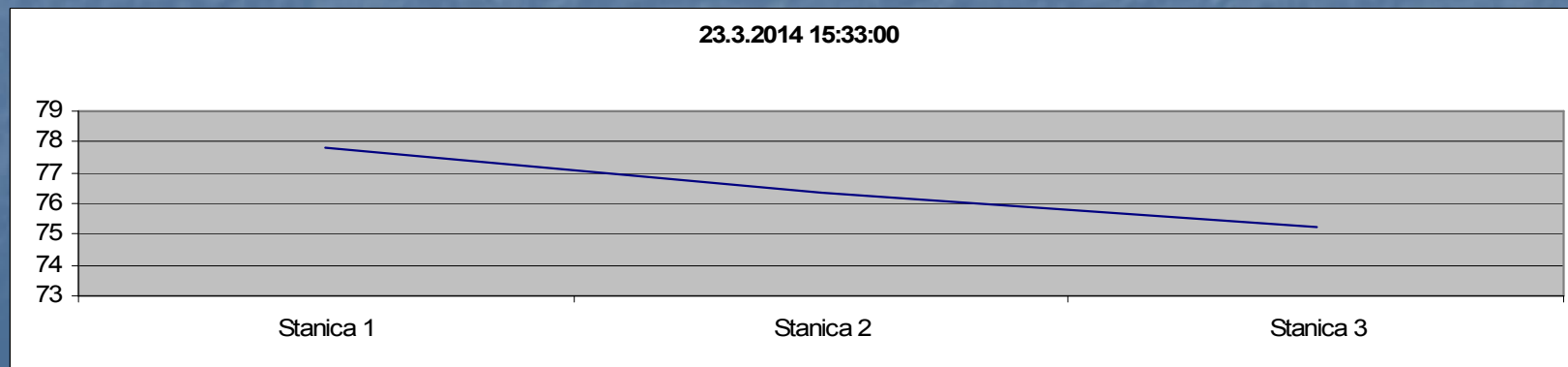


Prikaz

- Vremenske serije



- Profil u realnom vremenu



Primena

- Merenje vodostaja na rekama, kanalima i bunarima
- Upravljanje rizicima
- Sistem ranog upozorenja
- Prognoza

