



WATER @ SGS

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INVESTOR DAYS, 29-30 OCTOBER 2015

WHEN YOU NEED TO BE SURE

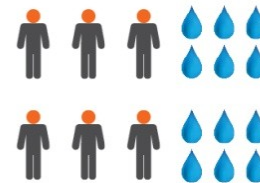




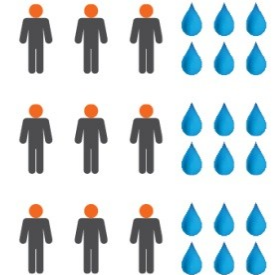


70% OF WATER IS USED FOR AGRICULTURE AND FOOD

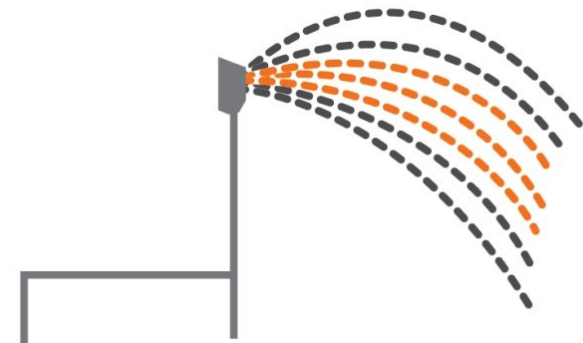
2000



2050



20% OF IRRIGATED LAND CONTRIBUTES TO **40% OF FOOD PRODUCTION**

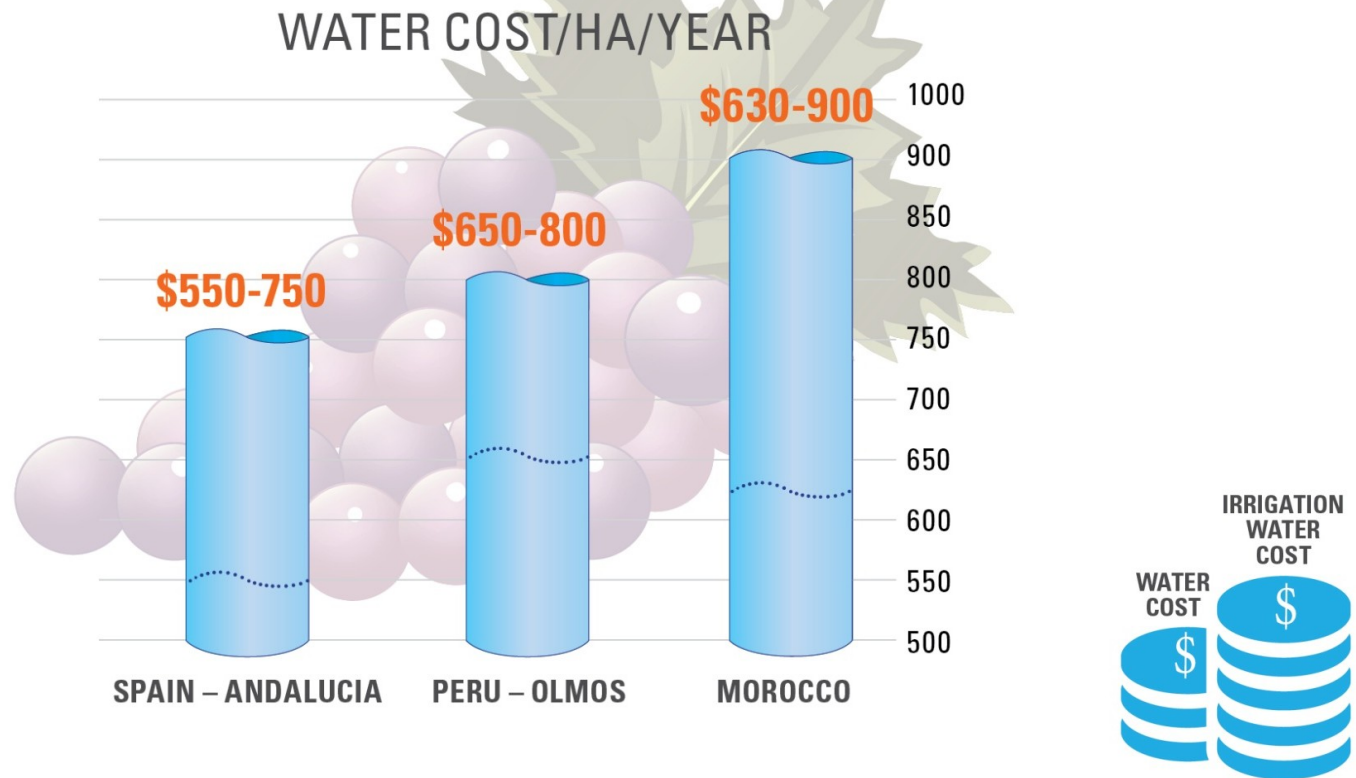


EFFICIENCY OF IRRIGATED AGRICULTURE IS BELOW **40%**

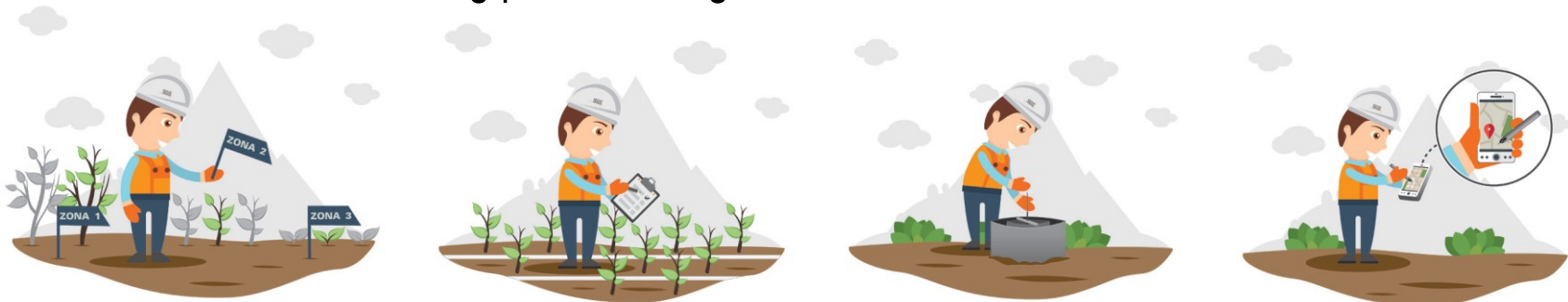
Sources: UN, OECD and FAO

COST OF WATER FOR IRRIGATION EXAMPLES

GRAPES USE IN AVERAGE 9000m³/ha/year



- Provide farmers, agronomists and agricultural investors with full support for water management.
- Help understand the following in terms of irrigation:
 - what to do?
 - when to do it?
 - and once it is done, how to implement continuous monitoring?
- Offer a full range of services from the development of the baseline and pre-operational phase to very detailed information on irrigation scheduling/precision irrigation.



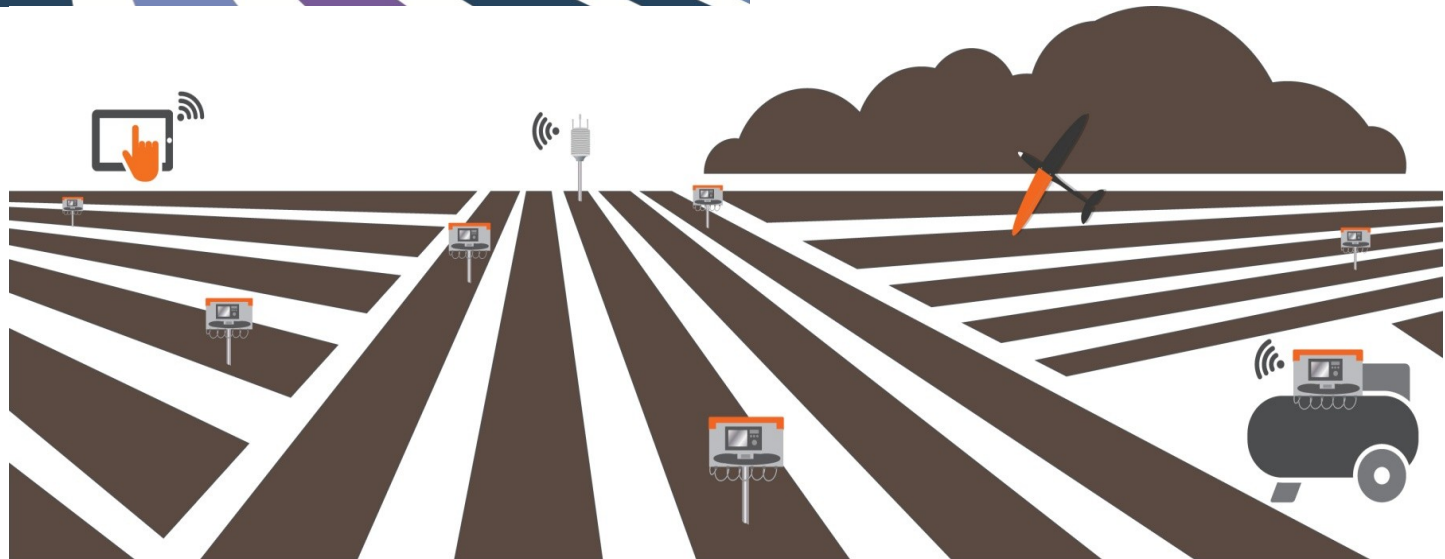


PROCESS

- Field data (soil characteristics/mgmt zones + soil moisture measurements)
- Weather (actual + forecast)
- Recommendations for irrigation
- Potential automation

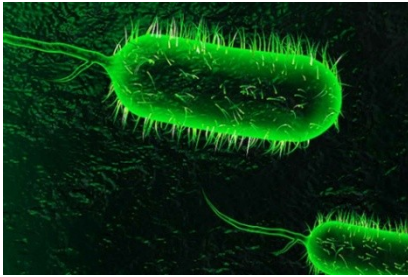
INGREDIENTS

- Soil science
- Sensors
- Data analytics
- Client interface



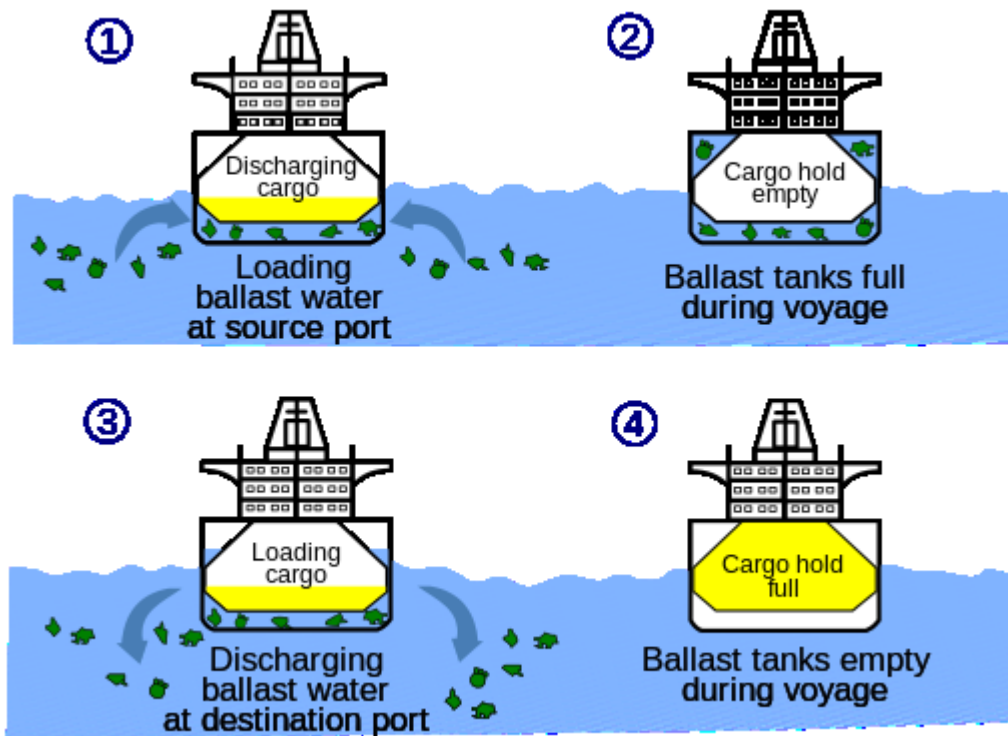
BALLAST WATER SERVICES





- “1 million infected, 10000 deaths”
Vibrio Cholera 1991 Peru Outbreak
- The Zebra Mussel
- Northern Pacific SeaStar
- North American Comb Jellyfish
- Chinese Mitten Crab

INVASIVE SPECIES SPREAD VIA
BALLAST WATER

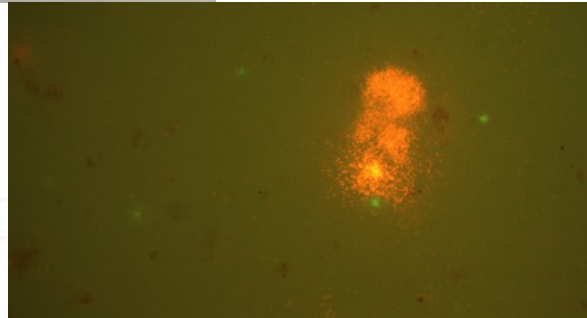
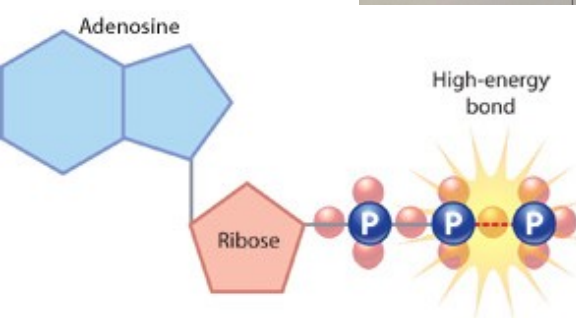


■ WHY INNOVATE

- 1% of the world's oceans are transported by ships each year
- Over 10000 species make the same voyage via ballast water

■ IMO BALLAST CONVENTION

- 1) Aim to stop the spread of invasive species
- 2) Adopted in 2004 requires 35% of registered global tonnage to enforce – 32.9% (Sept 15)
- 3) USA economic loss \$138b/year
- 4) On board treatment system – chlorination, UV & chemical
- 5) Lack of technology to monitor efficiency & compliance

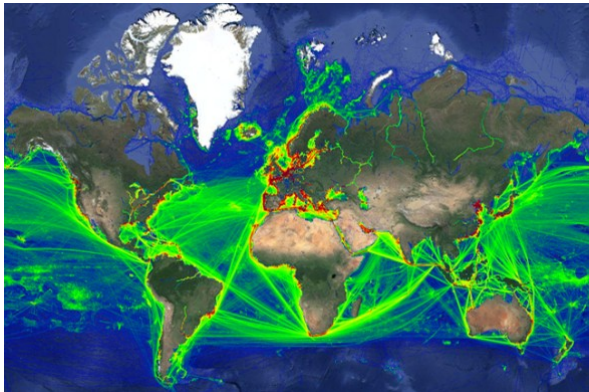


■ A global need

- Commissioned by the German authority
- Validated through Singapore Ports

■ SGS development

- On board sampler
- Portable laboratories
- Rapid test methods
 - Microscopic examination (Plankton)
 - ATP (Adenosine Tri-Phosphate)
 - FISH (Fluorescent In-Situ Hybridization)
- On shore lab – verification via traditional methods



Marine services

- Ballast Water Testing and Sampling meeting VGP & IMO requirements
- Stack (Engine Exhaust) Emission Measurements
- Scrubber Wash Water Testing and Sampling
- Potable Water Testing
- MARPOL V (Tank Wash Water)
- Calibration of Monitoring Devices
- E-Data Management & Energy Efficiency
- Bunker and Lube testing



SGS