MED-GOLD

Il concetto di valore delle previsioni climatiche dalla prospettiva dell'utente: l'esperienza del progetto **MED-GOLD**

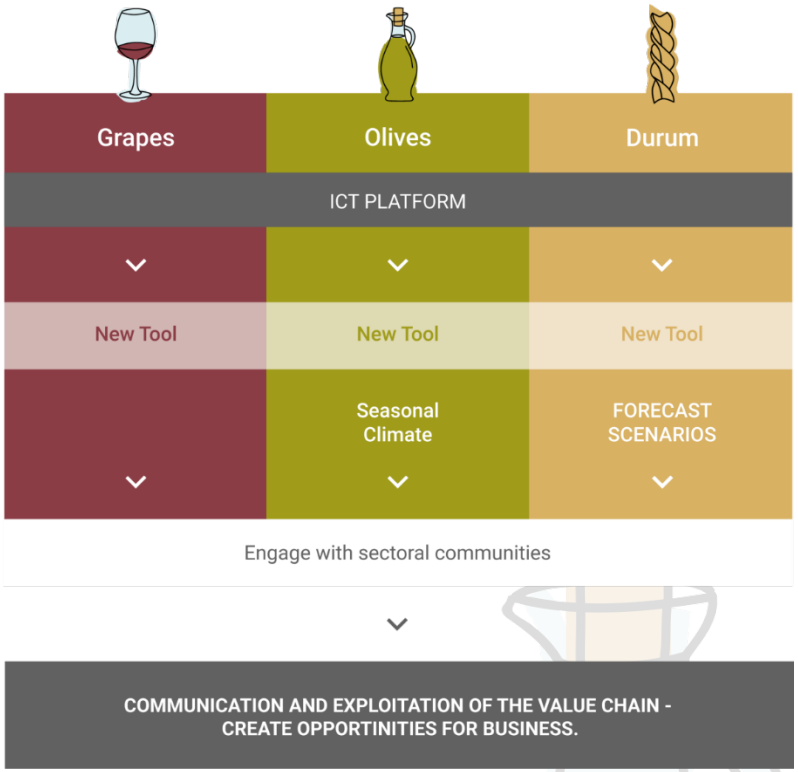
18-06-2019

Prima Conferenza Nazionale sulle Previsioni Meteorologiche e Climatiche

Alessandro Dell'Aquila for the MED-GOLD Team

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776467.

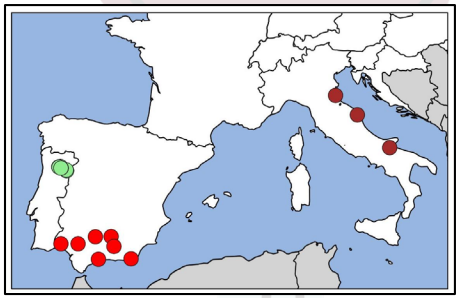
STRATEGY



- CS Climate Science
- AG Agro-ecosystem models
- ST Stakeholders engagement
- TS Technical Solutions
- TR Training activities
- TR Industrial problem-holders

MED-GOLD: Main objectives

- **Involve users** in the design, development, test, and evaluation of the added value of pilot climate services for olive, grape, and durum wheat
- Refine, validate, and upscale **pilot services** with the wider European and global user communities for olive / oil, grape / wine and durum wheat / pasta.
- **Ensure replicability** of climate services for other crops / climates (e.g., coffee) and link with global policy-making
- Implement a comprehensive communication and market plan to **enhance uptake** for MED-GOLD climate services
- Build better informed and connected **end-user communities** for the global olive oil, wine, and pasta food systems and related policy making



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WORKPLAN

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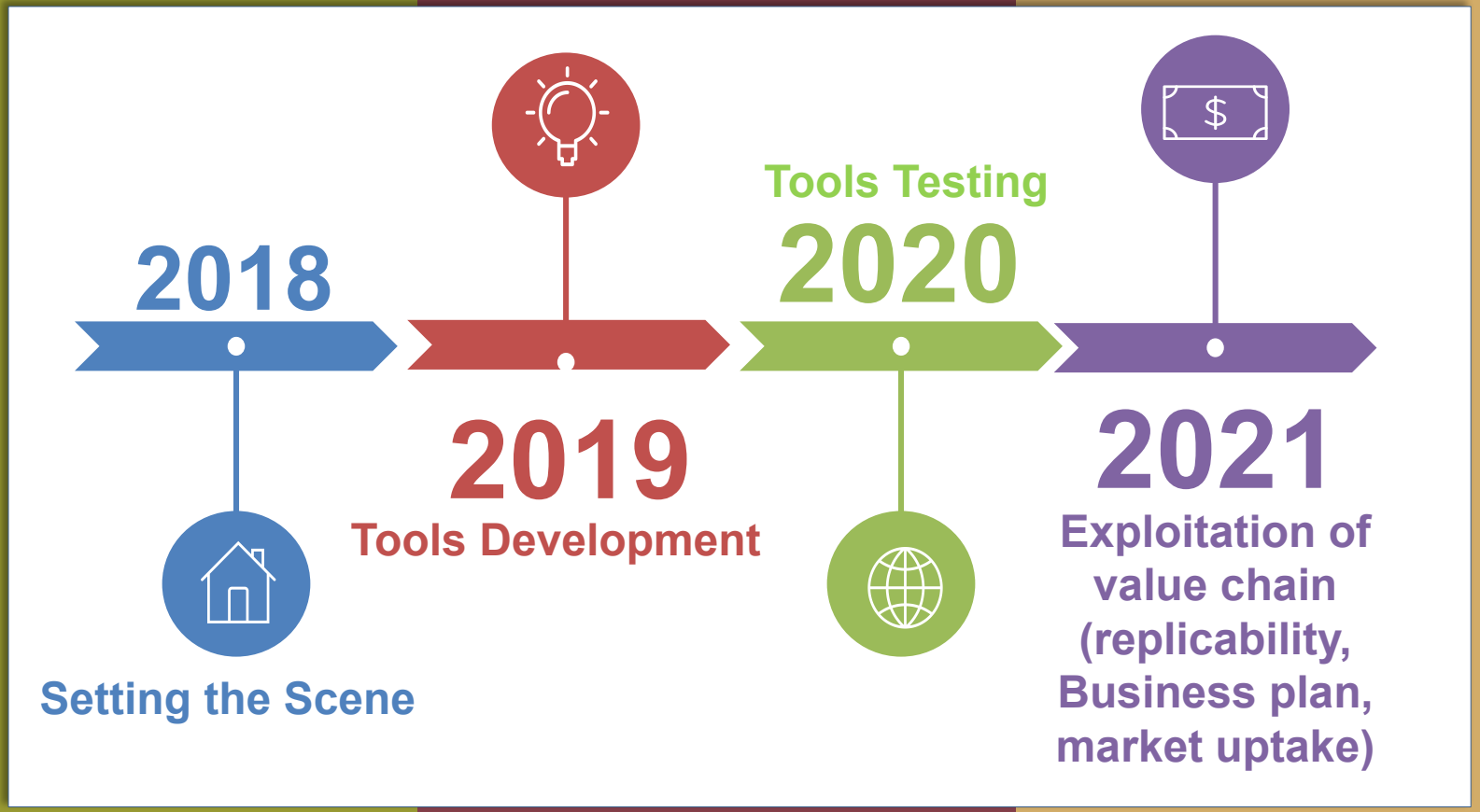

Scoping workshops

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Olives/olive oil

DCOOP Hq.
Antequera, Málaga
SPAIN

June 2018
May 2019

Grapes/Wine

Sogrape Vinhos
Porto
PORTUGAL

May 2018
May 2019

Durum wheat/pasta

HORTA
Ca' Bosco, Ravenna
ITALY

May 2018
April 2019

Talking about climate predictions with users

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Weather forecast

Seasonal probabilistic forecast

Climate projections

Users Requirements

- **When and where is olive fly pest expected in my area during the next season?**
- **Which new pests will I have to fight against during the next ten years?**
- **What will be the productivity under climate change?**

- SOGRAPE is interested in both seasonal predictions and climate change projections.
- Variables of interest: Temperature, precipitation and climatic indices derived from them.
- Region of interest: Douro region.
- Temporal resolution:

Seasonal predictions	Climate projections
weekly will be ideal but monthly will be useful too	monthly will be ideal but trimestral, half-annual or annual will be also fine

- Required level of reliability:

Seasonal predictions	Climate projections
70%	80%

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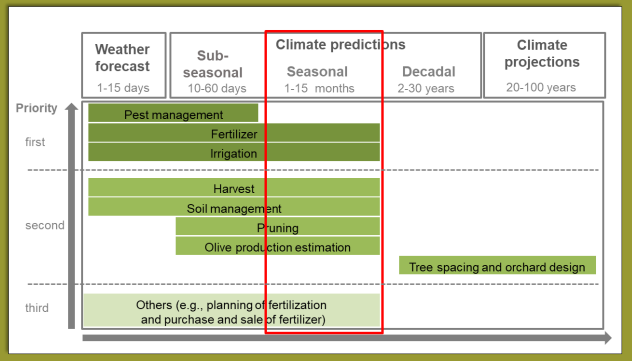
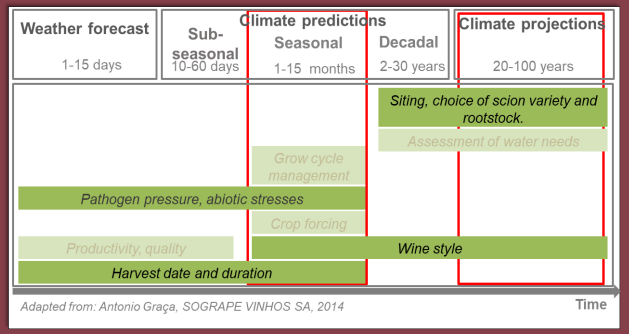
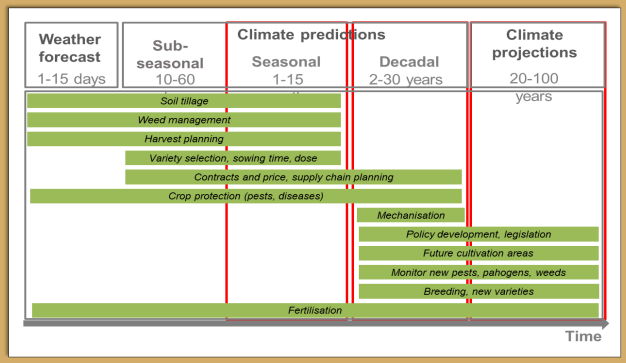
- Field preparation and choice of variety
- Time of sowing
- Fertilization (usally three times)
- Treatement for deseases (usually twice)
- Weed control (usually twice)
- Post-harvesting retrospective for quality and commercial value







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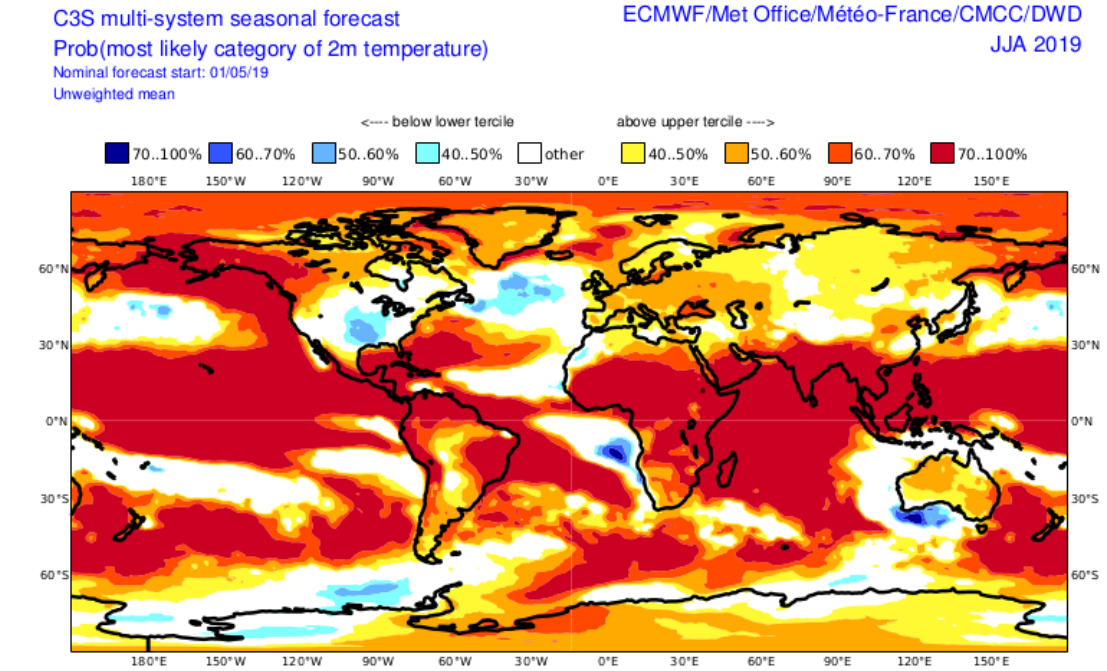
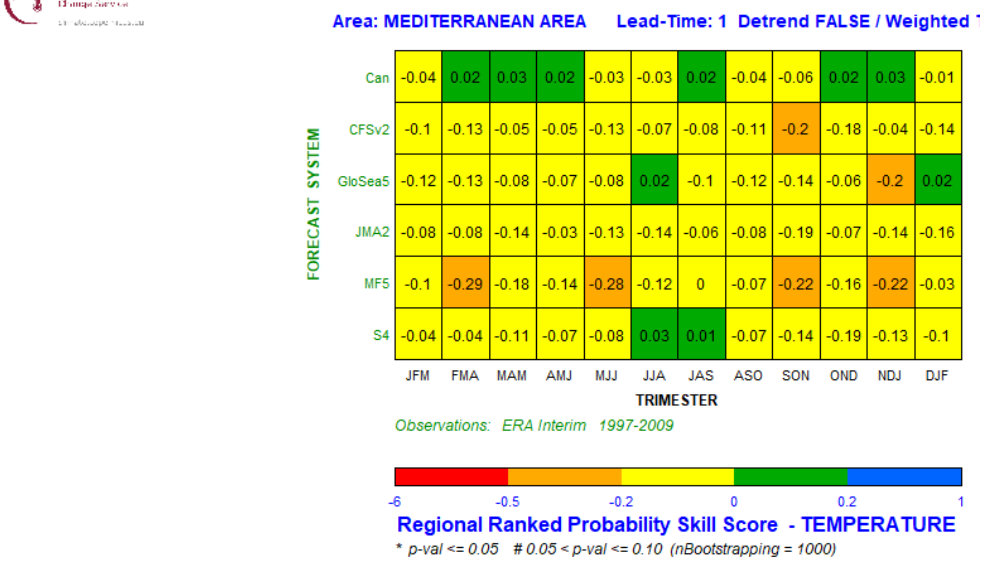
TIPPING ATTITUDES

- Protecting investments
- Avoiding production losses
- Avoiding quality loss
- Improved operational scheduling
- Better labour negotiation
- More efficient input stock management

TRUSTWORTHINESS for providers

- Ranked Probability Score (RPS)
- Continuous Ranked Probability Score (CRPS)
- ....





MedCOF Mediterranean Climate Outlook Forum

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TRUSTWORTHINESS for users

- 50% HIT RATE

Kidding me…!!?!

- 83% HIT RATE

Yesss!

From Antonio Graca, Sogrape Vinhos

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USERS WILL TRUST.....

- Value from
  - Foresight that materializes
  - Information that is easy and quick to assimilate
  - Knowledge that improves their baseline
  - Services that customize to their needs
  - Providers who empower them

From Antonio Graca, Sogrape Vinhos

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When users met providers…

MED-GOLD workshop on the user perspective of seasonal forecasts, Brussels 11/02/2019

The world cannot be understood without numbers. But the world cannot be understood with numbers alone

Hans Rosling

Key conclusions:

- ✓ Terminology is pivotal to the successful co-development of climate services.
- ✓ Such terminology is discussed and **co-developed between users and scientists** to allow a shared understanding of the key concepts relevant **to users' decision-making**. MED-GOLD is currently on a **glossary** that aims to find a common ground
- ✓ Two main classes of tactic decisions:
  - ➢ ***Gradual (i.e. date of harvesting):*** For this type of decision, the supporting information must be in the form of a likely range of the corresponding climate indicator
  - ➢ ***Dichotomic (fertilizer A or B?):*** For this type of decision, the supporting information must be in the form of a likely large anomaly with respect to the normal
- ✓ What was considered ***normal*** in the past is currently changing: the traditional knowledge that used to guide agricultural practices is no longer working under the ***new normal*** situation brought up by climate change.

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When users met providers…

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The world cannot be understood without numbers. But the world cannot be understood with numbers alone

Hans Rosling

JANE & JOHN APPROACH

As example: in green years, real observations for as bioclimatic indicator from weather stations located in the site for which the forecast was made, confirmed the forecasting **in terms of tercile**

Year	SprR
2018	1
2017	1
2016	1
2015	1
2014	1
2013	1
2012	0
2011	1
2010	1
2009	0
2008	0
2007	1
2006	0
2005	0
2004	0
2003	1
2002	1
2001	1
2000	0
1999	0
1998	1
1997	0
1996	1
1995	1
1994	0
	60%

The **hit rate** is the percentage of green years in the total number of years in the series.

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After the workhsop: beta version of the services

After collecting the key requirements, identifying the key decision, starting working on the trust/value

An example of information for a «Gradual» decision (i.e. Sanitary risk for grapes in Douro Valley)

Bio-climatic indicators selected for the wine sector

- SprR
- GST
- SU35
- HarvestR
- WSDI

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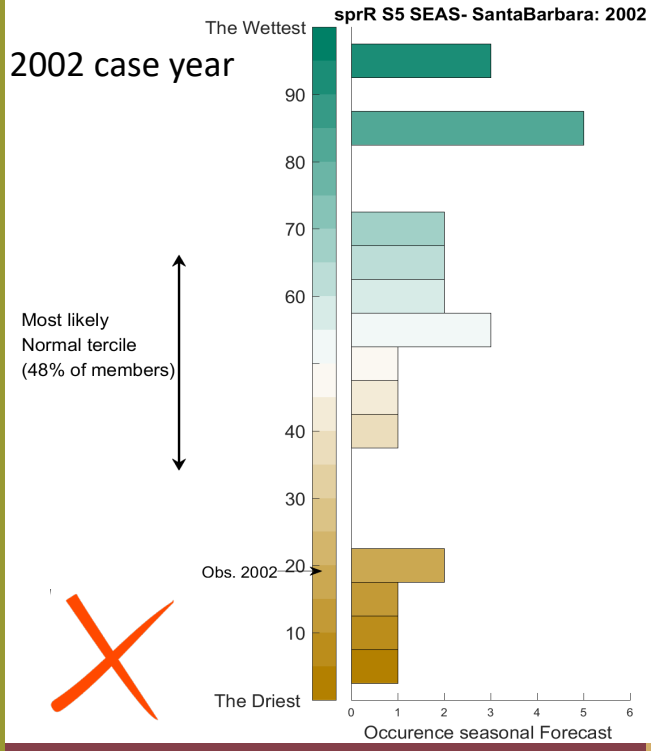
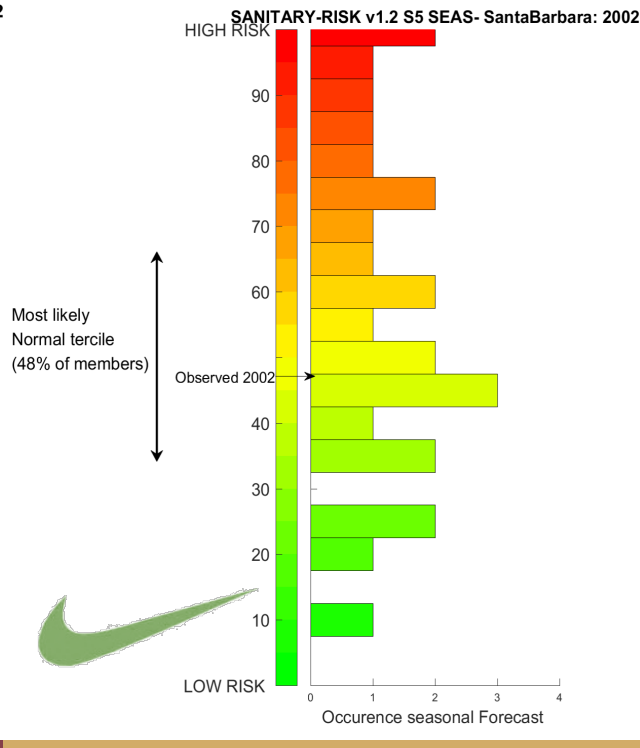
Compound risk index for the wine sector

SANITARY RISK : Main Sources of risks identified:

1.High/low **SprR**
2.High **HarvestR**
3.Low **GST**





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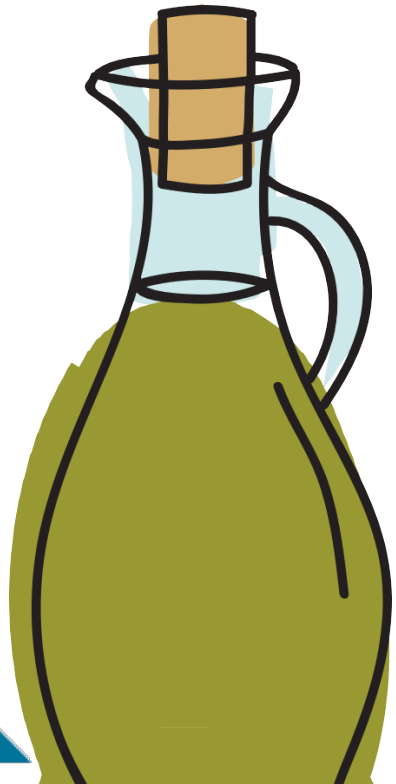
medgold_h2020

Thank you
Ευχαριστίες
Grazie
Gracias
Obrigado
Merci



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1ª CONFERENZA NAZIONALE SULLE PREVISIONI METEOROLOGICHE E CLIMATICHE

Poster session: Nowcasting e previsioni a breve termine

- ***Il sistema modellistico di qualità dell'aria MINNI per la previsione a breve termine delle concentrazioni di inquinanti dannosi per l'uomo.*** *Presenta: Mario ADANI, ENEA, Bologna Autori: Adani Mario (a nome del Laboratorio di qualità dell'aria SSPT-MET-INAT), Guarnieri Guido*
- ***Previsioni ad alta risoluzione della circolazione e dello stato del mare nel sistema di bacini Mediterraneo-Mar Nero*** *Presenta: Roberto IACONO, ENEA, Roma Autori: G. Sannino, A. Bargagli, A. Carillo, R. Iacono, E. Lombardi, E. Napolitano, M. Palma, G. Pisacane, M.V. Struglia*

Poster session: Previsioni decadali e proiezioni di lungo termine

- ***Analisi di simulazioni climatiche regionali in convezione esplicita con il modello RegCM4*** *Presenta: Paolo STOCCHI, ENEA, Bologna Autori: P. Stocchi, E.Pichelli, J., A. Torres and E. Coppola*
- ***Modelli climatici regionali accoppiati: la piattaforma RegESM - Regional Earth System Model per il Mediterraneo*** *Presenta: Maria Vittoria STRUGLIA, ENEA, Roma Autori: Struglia M.V., Anav A., Calmanti S., Carillo A., dell'Aquila A., Pisacane G., Sannino G.*

Poster session: Previsioni a medio termine e sub–stagionali

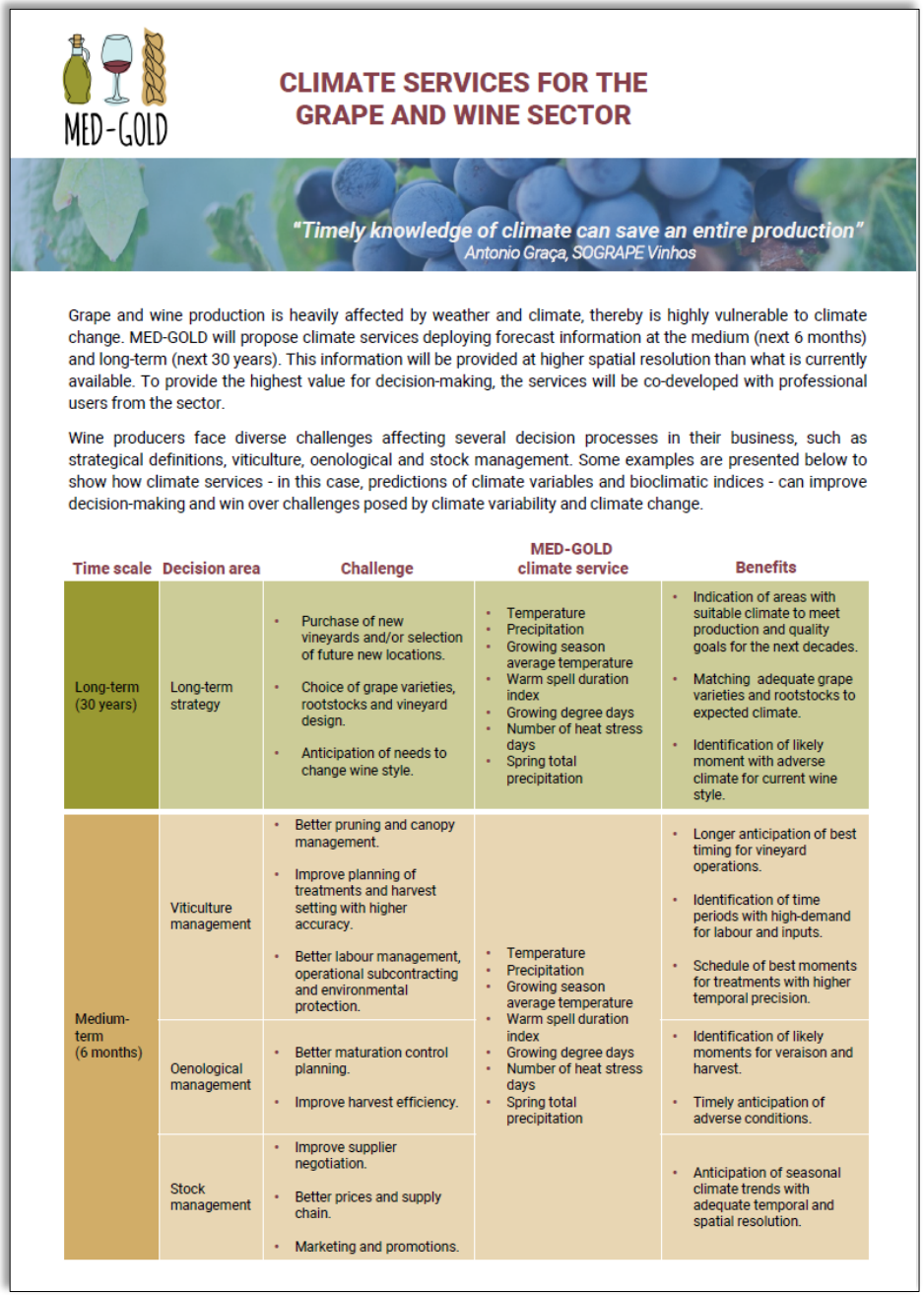
- ***Mappatura del potenziale da energie rinnovabili sul Lesotho mediante il modello WRF*** *Presenta: Massimo D'ISIDORO, ENEA, Bologna Autori: Massimo D'Isidoro, Gino Briganti, Lina Vitali, Gaia Righini, Lorenzo Moretti*

Poster session: Previsioni stagionali e multi–annuali

- ***Miglioramento delle previsioni climatiche con il modello del Sistema Terra EC-Earth: contributo dei processi di land-surface*** *Presenta: Franco CATALANO, ENEA, Roma Autori: Franco Catalano, Andrea Alessandri, Matteo De Felice*

Infosheets

https://www.med-gold.eu/documents-publications/



MED-GOLD

CLIMATE SERVICES FOR THE GRAPE AND WINE SECTOR

"Timely knowledge of climate can save an entire production"
Antonio Graça, SOGRAPE Vinhos

Grape and wine production is heavily affected by weather and climate, thereby is highly vulnerable to climate change. MED-GOLD will propose climate services deploying forecast information at the medium (next 6 months) and long-term (next 30 years). This information will be provided at higher spatial resolution than what is currently available. To provide the highest value for decision-making, the services will be co-developed with professional users from the sector.

Wine producers face diverse challenges affecting several decision processes in their business, such as strategical definitions, viticulture, oenological and stock management. Some examples are presented below to show how climate services - in this case, predictions of climate variables and bioclimatic indices - can improve decision-making and win over challenges posed by climate variability and climate change.

Time scale	Decision area	Challenge	MED-GOLD climate service	Benefits
Long-term (30 years)	Long-term strategy	• Purchase of new vineyards and/or selection of future new locations. • Choice of grape varieties, rootstocks and vineyard design. • Anticipation of needs to change wine style.	• Temperature • Precipitation • Growing season average temperature • Warm spell duration index • Growing degree days • Number of heat stress days • Spring total precipitation	• Indication of areas with suitable climate to meet production and quality goals for the next decades. • Matching adequate grape varieties and rootstocks to expected climate. • Identification of likely moment with adverse climate for current wine style.
Medium-term (6 months)	Viticulture management	• Better pruning and canopy management. • Improve planning of treatments and harvest setting with higher accuracy. • Better labour management, operational subcontracting and environmental protection.	• Temperature • Precipitation • Growing season average temperature • Warm spell duration index • Growing degree days • Number of heat stress days • Spring total precipitation	• Longer anticipation of best timing for vineyard operations. • Identification of time periods with high-demand for labour and inputs. • Schedule of best moments for treatments with higher temporal precision.
	Oenological management	• Better maturation control planning. • Improve harvest efficiency.		• Identification of likely moments for veraison and harvest. • Timely anticipation of adverse conditions.
	Stock management	• Improve supplier negotiation. • Better prices and supply chain. • Marketing and promotions.		• Anticipation of seasonal climate trends with adequate temporal and spatial resolution.

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Grape/wine

MED-GOLD will formulate the best seasonal probabilistic predictions of extreme and biological climate indices at Mediterranean and site specific spatial scales, so as to allow for efficient pest and operational management strategies.

The climate service will support farmers in addressing issues like:

- **How many protection treatments are expected for the upcoming season?**
- **What variety / rootstock / clone will I need in my area for the next 30 years?**

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Olive/olive oil: key requirements

- The majority of agronomist point out as main decisions in olive crops: Phytosanitary treatment (all year), fertilization (March to October) and irrigation.
- the climatic parameter most important for agronomiscs are: precipitation, temperature and wind
- The most critical period are Spring in this season it carry out many agronomic labors. However, during all year is necessary different forecast that can improve the making decision.

- TIME SCALE: monthly /seasonal

- Climate Indexes
  - *Total precipitation*
  - *Number of days with minimum temperature below -3 ºC in winter, in spring or for the whole year*
  - *Number of days with maximum temperature above 30 ºC in spring*
  - *Number of days with maximum temperature above 40 ºC in summer*
  - *Number of days with maximum temperature below -8 ºC in winter*
  - *Mean summer maximum temperature*

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Durum wheat/pasta

MED-GOLD will combine different approaches to provide both seasonal forecasts and decadal predictions for durum wheat yield, risks of pests and diseases, as well as farmer-oriented decision process to define and apply better agro-management plans, such as:

- **Can optimal plan for fertilisation be developed?**
- **What information can be provided to select optimal variety and density?**
- **How can the supply chain be adapted to climate change to ensure sustainable production, quality and fair income?**

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