

A landscape photograph of a valley. The sky is a deep blue, and a bright sun is shining from the upper left, creating a starburst effect with rays of light. The sun's light illuminates the valley floor, where a river or stream is visible, winding through the landscape. The hillsides are covered in green vegetation, and the overall scene is peaceful and scenic.

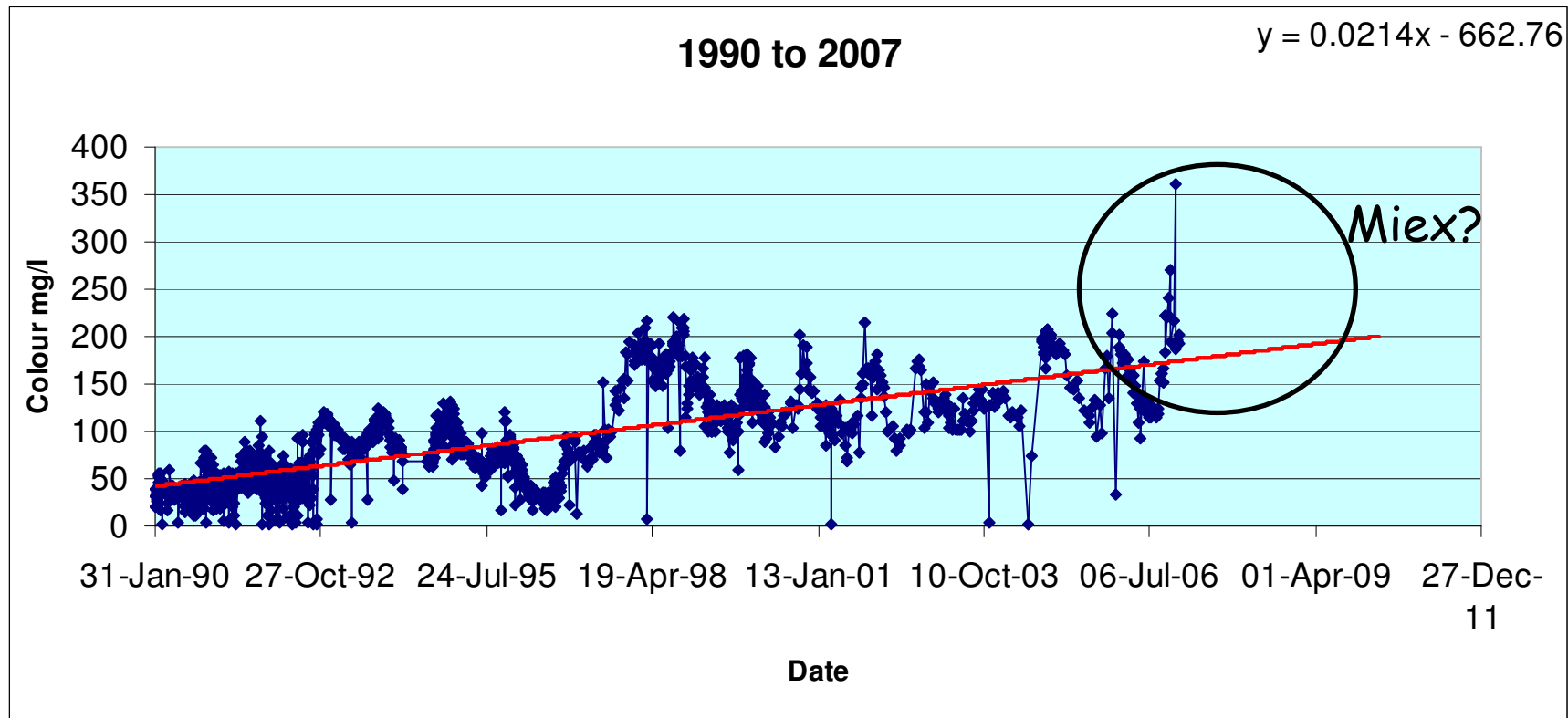
Moorland Fires – The Implications for Water

Andrew Walker – Yorkshire Water



Dissolved Organic Carbon

Affects about 70% of our resources...and its increasing....
Significant challenges due to increasing colour



Treatment issues of increasing colour

- Very High coagulant doses
- Increased sludge volumes
- High operational cost
- High clarified turbidity
- Short filter runs
- Reduced output
- Turbidity breakthrough at low headloss
- Trihalomethanes
- Further treatment investment
- New treatment processes





Do nothing option
5ish WTW per AMP

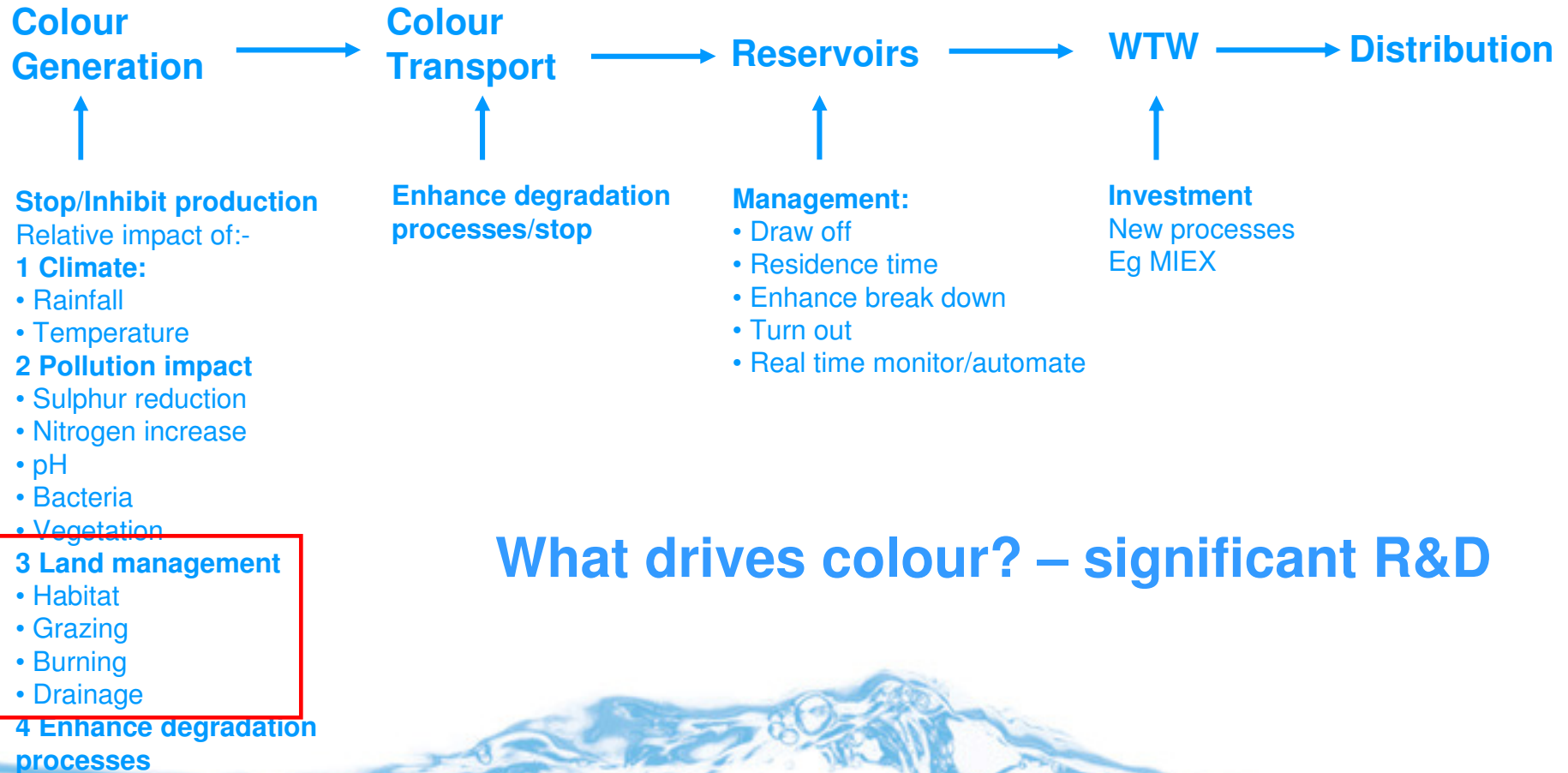
Regulation and sustainability approach is developing and evolving...

Eg The overriding aim of Article 7 Water Framework Directive :-

“ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water”



Source – pathway – receptor approach



What drives colour? – significant R&D



Catchment Management – Taking R&D into Strategy
Impacts of vegetation type on DOC – Aberdeen & Leeds University

Colour impact?



Heather Moorland



Grazing



Heather Burning

We can model and identify the areas that generate colour

Colour hazard map

Value

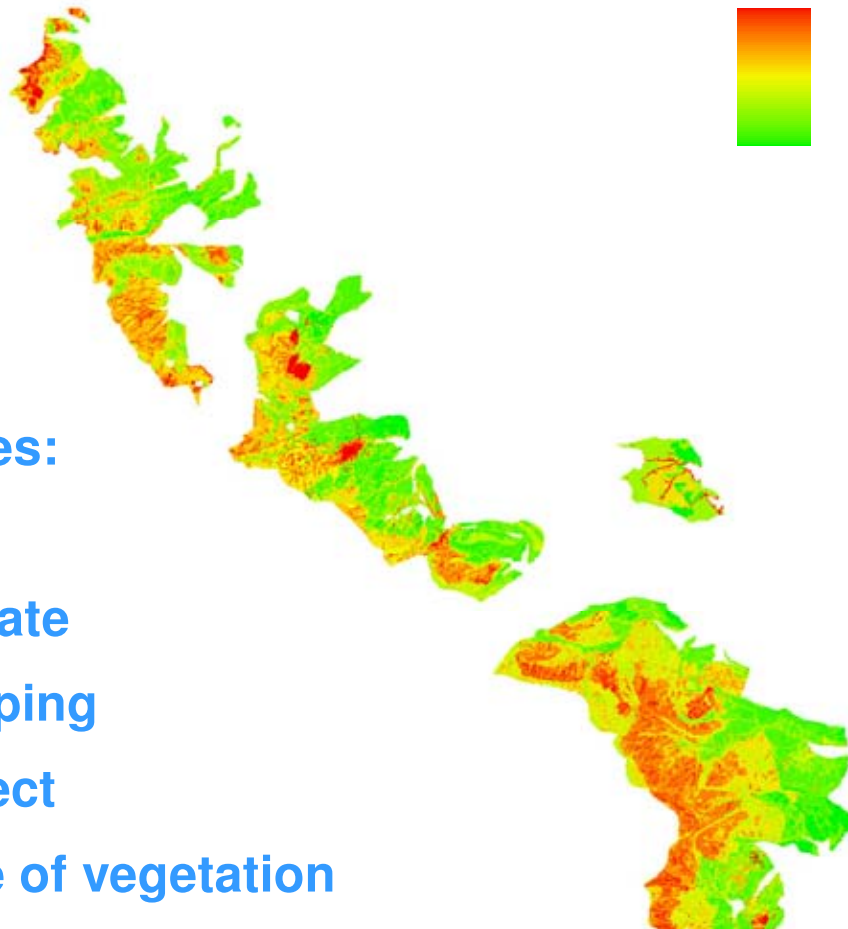
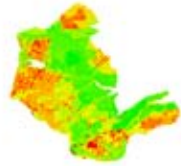


High : 1525.8

Low : 15.4

Causes:

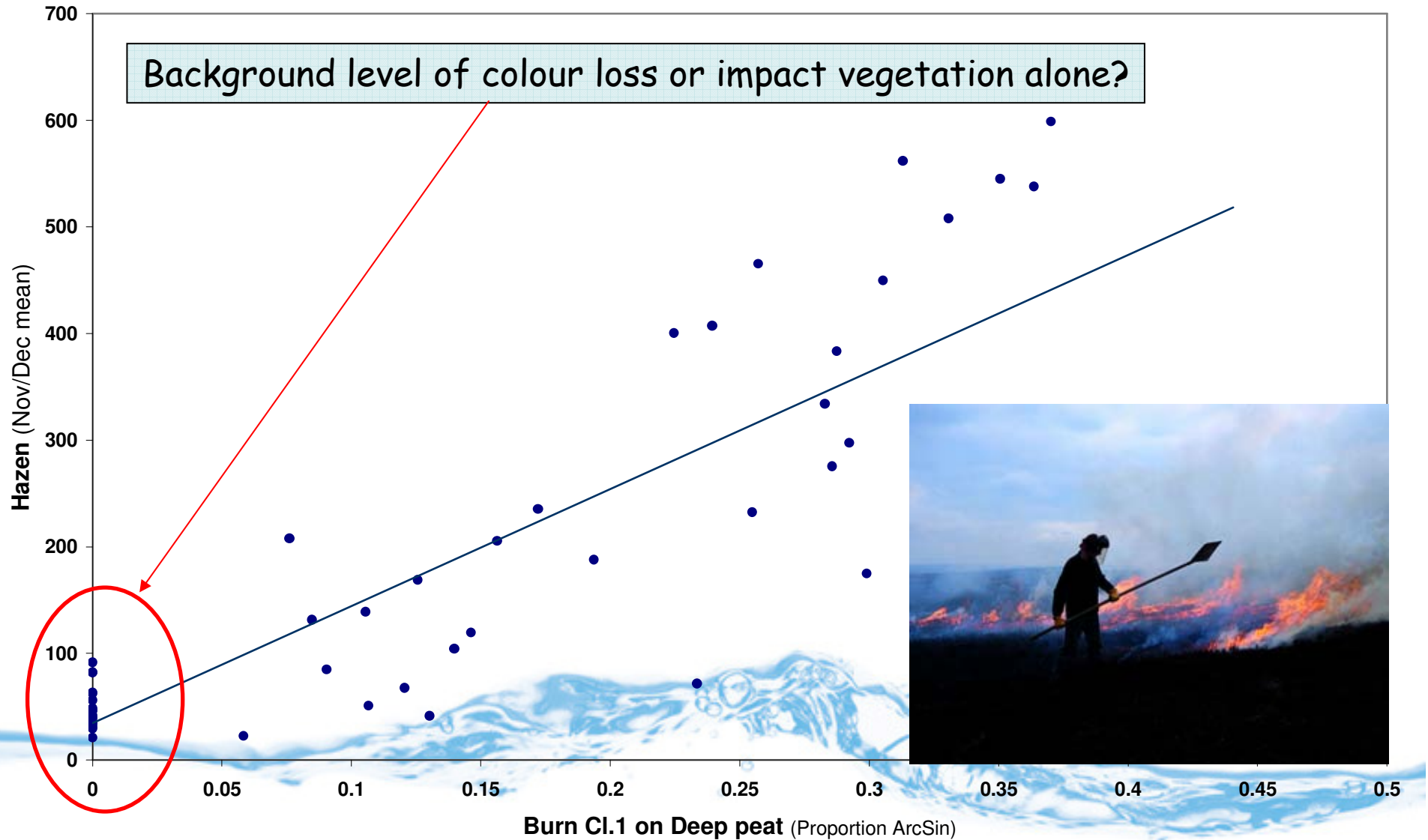
- Peat
- Climate
- Gripping
- Aspect
- Type of vegetation



The impact of “managed” fires on colour release



Area of burning significant relationship





Grip blocking (ditch drains)

UK-wide: impact of blocking on colour

➤ Blocking reduces water colour

Condition	Mean	Median
Blocked	88.0	73.8
Unblocked	112.8	125.6

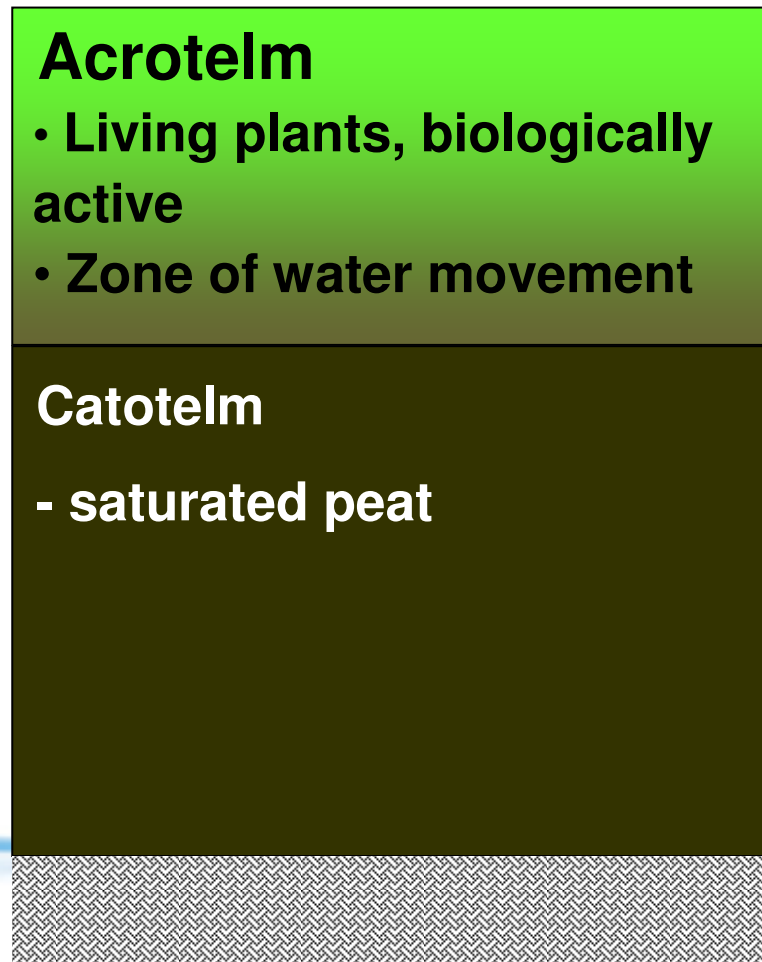




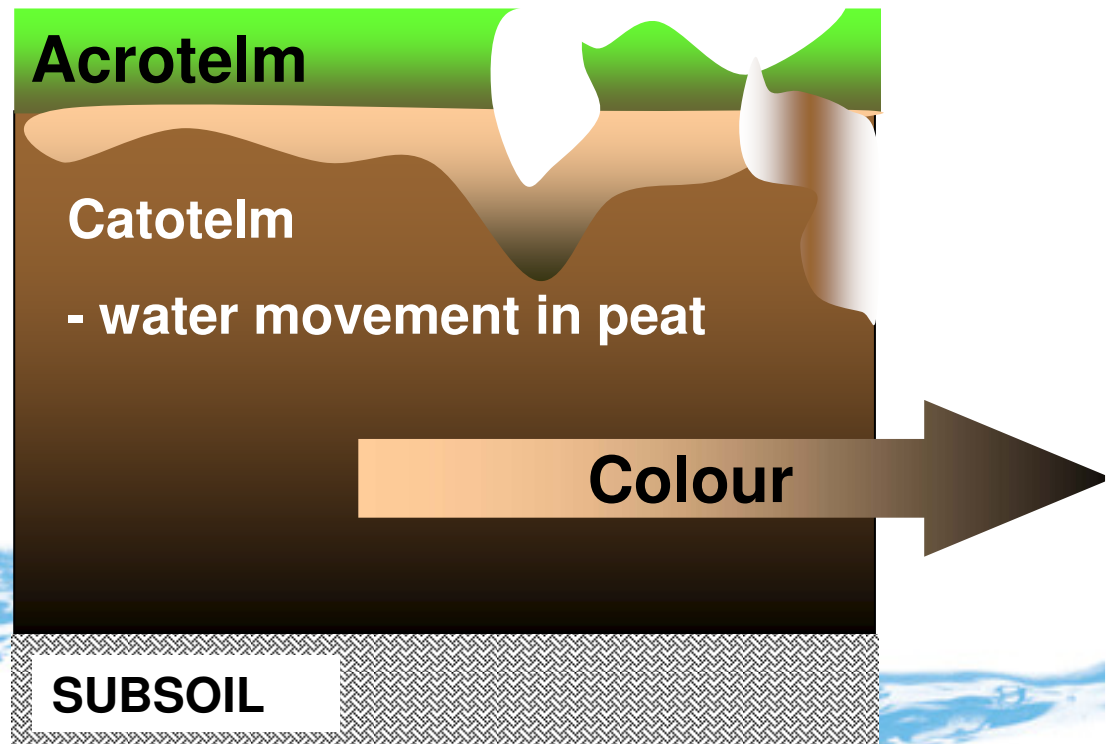
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How does a bog degrade & form colour?

Healthy blanket bog



Degraded bog



**Wild fire is even more damaging.....
We can not just stop burning
Hotter fires take longer to re vegetate**





YorkshireWater

Drought & Climate Change

We expect

- Changes in rainfall and river flows
- Changes in storm rainfall
- Changes in temperature

Which will impact on

- Peat water levels
- Bacterial productivity



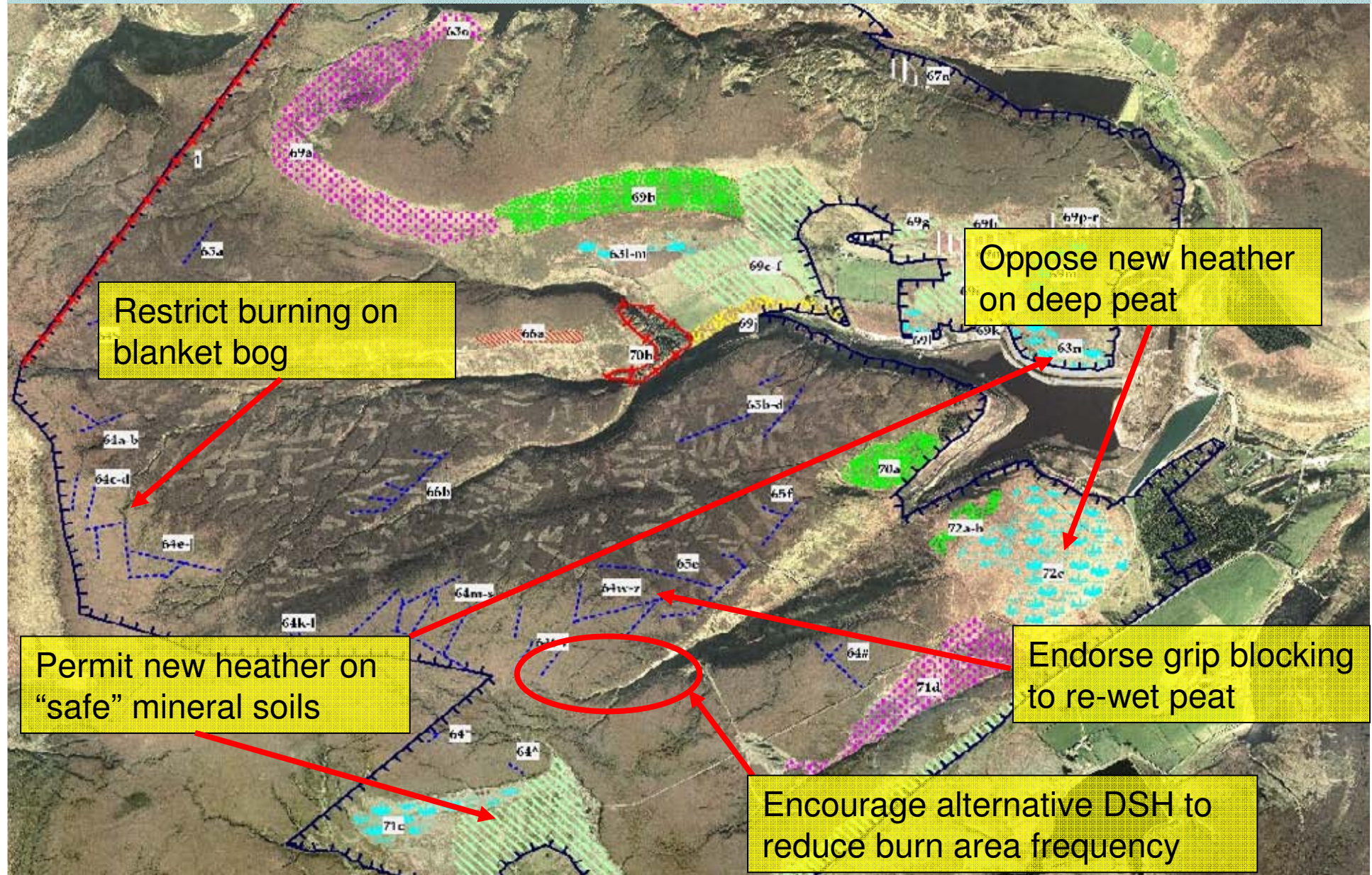
What does good look like for colour....

How do we achieve this?



What does implementation look like?

Using knowledge to guide SSSI Recovery project – No own goals!





Taking the Strategic View - Should we be looking at introducing and extending the mosses that helped form peat originally?

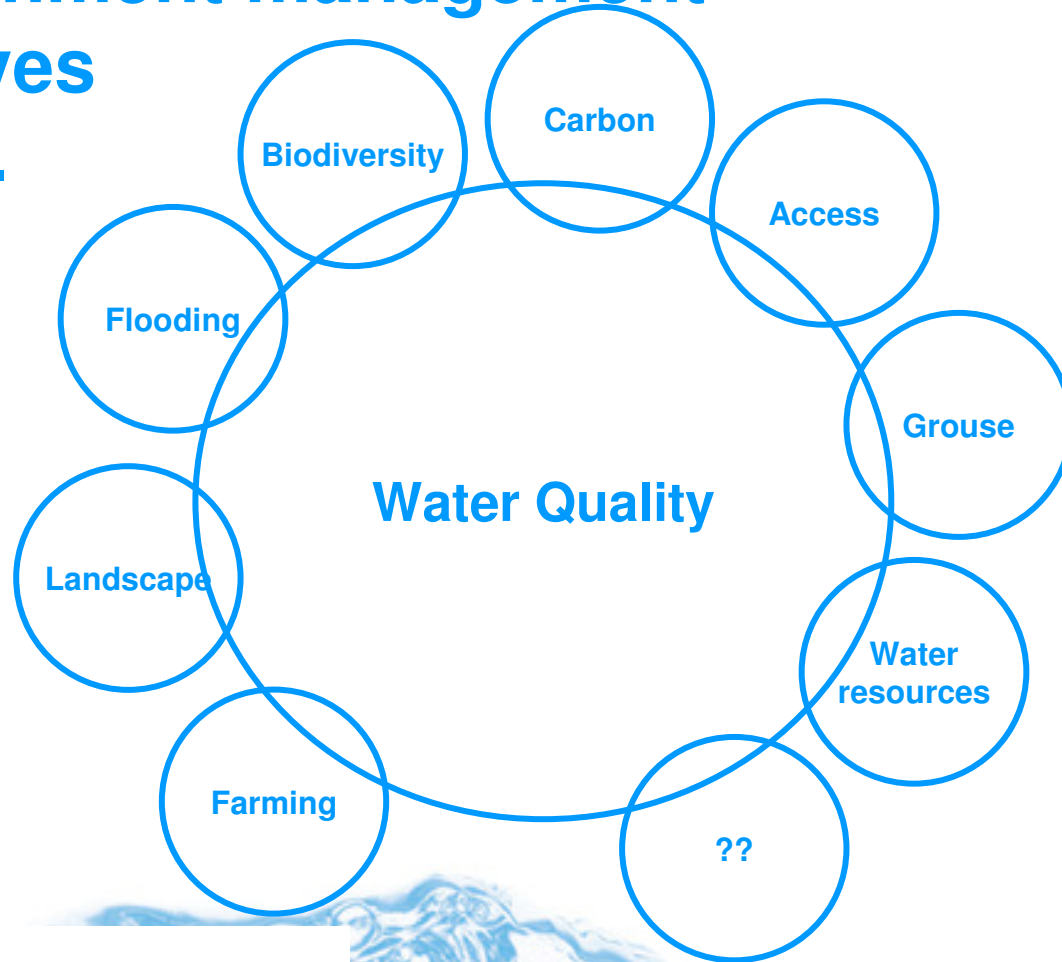




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Developing catchment management Multiple objectives and interests.....

Need broad engagement,
Evaluation & integration
of wider benefits and
disbenefits



Strategic Direction Statement

Customer Service

- └ Best WQ

- └ Zero Failures

- └ Develop catchment management





Catchment Solutions Require:

- **Development and assessment of methodologies at catchment scale**
- **Understanding of the economics**
- **Understanding time, certainty and security**
- **Further R&D on interactions**

