Vodena para u atmosferi
–
2. dio

Meteorologija

2.N

Motrenje oblaka

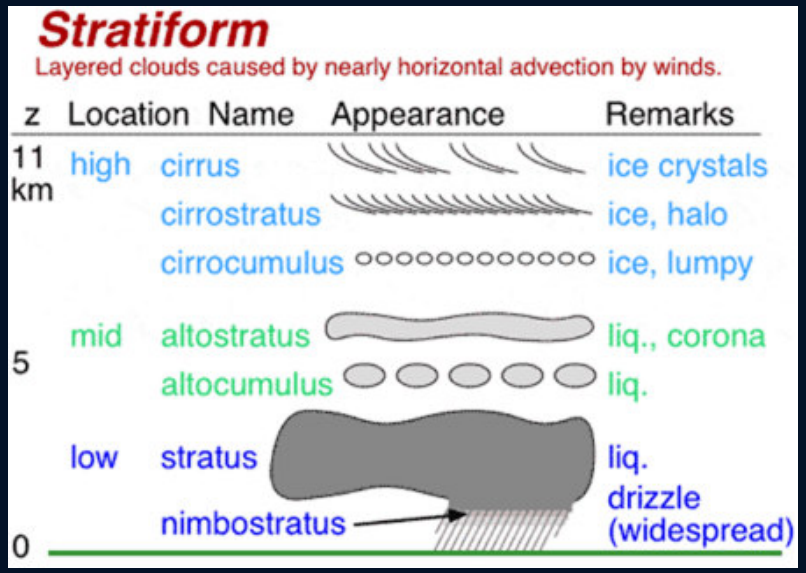
Vodena para u atmosferi – Meteorologija – 2.N

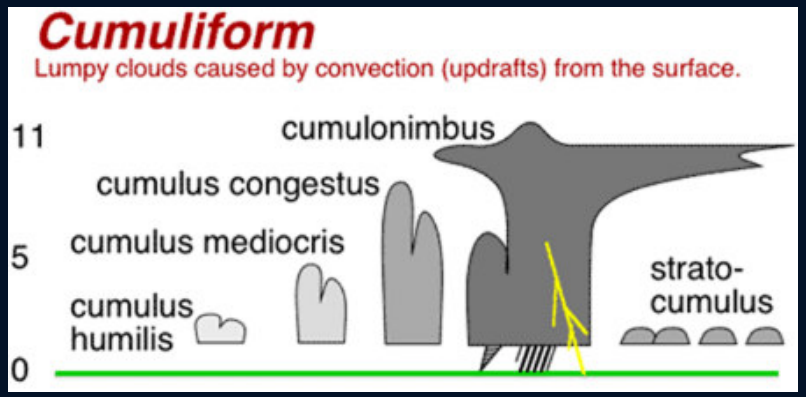
Naoblaka

- oblaci se motre s otvorena mjesta odakle se vidi čitav nebeski svod
- *naoblaka* – prekrivenost oblacima
  - za potrebe pomorstva se računa u osminama
  - za potrebe klimatologije se računa u desetinama
  - noću – gdje se ne vide zvijezde
- za lakše raspoznavanje koristi se Međunarodni atlas oblaka

Visina oblaka

- udaljenost od zemaljske površine do osnovice oblaka u metrima
- na brodu se procjenjuje odoka
  - uz obalu temeljem poznatih visina obale
  - na moru prema vrsti oblaka
- za meteo-svrhe:
  - pilot-balon – vrijeme potrebno da balon dođe do oblaka
  - laserski (ceilometar)





Smjer i brzina kretanja oblaka

- samo na kopnenim postajama sposebnim instrumentima
- na brodu
  - procjenjuje se kompasom prema strani obzora odakle dolaze oblaci (kao vjetar)
  - na točnost od 10° ili po smjerovima (do podjele od NNE, ENE, itd)

Oborine

Vodena para u atmosferi – Meteorologija – 2.N

Vrste oborina

- tekuće ili čvrste vodene čestice u atmosferi koje padaju ili lebde u troposferi podignute s tla ili se talože
- hidrometeori
- tekuće ili čvrste (± 0°C)
- prva skupina (padaju na zemlju)
  - kiša, rosulja, snijeg, zrnati snijeg, ledene iglice, ledena zrna, sugradica, tuča
- druga skupina (kondenzacija i sublimacija)
  - rosa, inje, mraz
- opasan led koji se stvara na palubi i nadgrađu broda u plovidbi

Tipovi oborina

- tip oborine
  - trajne oborine (jednolične, frontalne) – iz Ns, As, St, Sc
  - pljuskovite oborine (nejednolike, nagle, s prekidima) – s grmljavinom, Cb
- jačina oborina
  - u tragovima, slaba, umjerena, jaka
- količina oborine
  - l/m^2 ili visina sloja
- na kartama se oborine označavaju simbolima

STATION MODEL AND EXPLANATION OF WEATHER CODE FIGURES AND SYMBOLS

* Refers to "hail" only
** Refers to "soft hail", "small hail", and "hail"
*** The symbol is not plotted for "ww" when 00 is reported.
When "01, 02, or 03" is reported for "ww",
the symbol is plotted on the station circle.

Effective December 14, 2001

ww
Present Weather

Handout

ww	Present Weather	C_L Clouds of type C_L	C_M Clouds of type C_M	C_H Clouds of type C_H	C Type of Cloud	W Past Weather	N Total amount all clouds	a Barometer characteristics
00	Cloud development NOT observed or NOT observable during past hour.***	0 No Sc, St, Cu, or Cb clouds.	0 No Ac, As, or Ns clouds.	0 No Ci, Cc, or Cs clouds.	0 Ci	0 Cloud covering 1/2 or less of sky throughout the period.	0 No clouds.	0 Rising then falling. Now higher than, or the same as, 3 hours ago.
01	Clouds generally dissolving or becoming less developed during past hour.***							
02	State of sky on the whole unchanged during past hour.***							
03	Clouds generally forming or developing during past hour.***							
04	Visibility reduced by smoke.							
05	Haze.							
06	Widespread dust in suspension in the air, NOT raised by wind, at time of observation.							
07	Dust or sand raised by wind at time of observation.							
08	Well developed dust devil(s) within past hour.							
09	Dust storm or sandstorm within sight of or at station during past hour.							
10	Light fog.	1 Ragged Cu, other than bad weather, or Cu with little vertical development and seemingly flattened, or both.	1 As, the greatest part of which is semi-transparent through which the sun or moon may be faintly visible as through ground glass.	1 Filaments, strands, or hooks of Ci, not increasing.	1 Cc	1 Cloud covering more than 1/2 of sky during part of period and covering 1/2 or less during part of period.	1 One-eighth or less, but not zero.	1 Rising, then steady or rising, then rising more slowly. Now higher than 3 hours ago.
11	Patches of shallow fog at station, NOT deeper than 6 feet on land.							
12	More or less continuous shallow fog at station, NOT deeper than 6 feet on land.							
13	Lightning visible, no thunder heard.							
14	Precipitation within sight, but NOT reaching the ground.							
15	Precipitation within sight, reaching the ground, but distant from station.							
16	Precipitation within sight, reaching the ground, near to but NOT at station.							
17	Thunder heard, but no precipitation at the station.							
18	Squall(s) within sight during past hour.							
19	Funnel cloud(s) within sight during past hour.							
20	Drizzle (NOT freezing and NOT falling as showers) during past hour, but NOT at time of observation.	2 Cu of considerable development, generally towering, with or without other Cu or Sc; bases all at same level.	2 As, the greatest part of which is sufficiently dense to hide the sun or moon, or Ns.	2 Dense Ci in patches or twisted sheaves, usually not increasing; or Ci with towers or battlements or resembling cumuliform tufts.	2 Cs	2 Cloud covering more than 1/2 of sky throughout the period.	2 Two--eighths.	2 Rising (steady or unsteadily). Now higher than 3 hours ago.
21	Rain (NOT freezing and NOT falling as showers) during past hour, but NOT at time of observation.							
22	Snow (NOT falling as showers) during past hour, but NOT at time of observation.							
23	Rain and snow (NOT falling as showers) during past hour, but NOT at time of observation.							
24	Freezing drizzle or freezing rain (NOT falling as showers) during past hour, but NOT at time of observation.							
25	Showers of rain during past hour, but NOT at time of observation.							
26	Showers of snow, or of rain and snow, during past hour, but NOT at time of observation.							
27	Showers of hail, or of hail and rain, during past hour, but NOT at time of observation.							
28	Fog during past hour, but NOT at time of observation.							
29	Thunderstorm (with or without precipitation) during past hour, but NOT at time of observation.							
30	Slight or moderate dust storm or sandstorm, has decreased during past hour.	3 Cb with tops lacking clear-cut outlines, but are clearly not fibrous, cirriform, or anvil-shaped; Cu, Sc, or St may be present.	3 Ac (most of layer is semitransparent) other than crenelated or in cumuliform tufts; cloud elements change but slowly with all bases at a single level.	3 Ci, often anvil shaped derived from or associated with Cb.	3 Ac	3 Sandstorm or duststorm, or drifting or blowing snow.	3 Three-eighths.	3 Falling or steady, then rising then rising more rapidly. Now higher than 3 hours ago.
31	Slight or moderate dust storm or sandstorm, no appreciable change during past hour.							
32	Slight or moderate dust storm or sandstorm, has increased during past hour.							
33	Severe duststorm or sandstorm, has decreased during past hour.							
34	Severe duststorm or sandstorm, no appreciable change during past hour.							
35	Severe duststorm or sandstorm, has increased during past hour.							
36	Slight or moderate drifting snow, generally low.							
37	Heavy drifting snow, generally low.							
38	Slight or moderate blowing snow, generally high.							
39	Heavy blowing snow, generally high.							
40	Fog at a distance at time of ob.; but NOT at station during past hour.	4 Sc formed by spreading out of Cu; Cu may be present also.	4 Patches of semitransparent Ac which are at one or more levels; cloud elements are continuously changing.	4 Ci, hook-shaped and/or filaments, spreading over the sky and generally becoming denser as a whole.	4 As	4 Fog, or thick base.	4 Four-eighths.	4 Steady. Same as 3 hours ago.
41	Fog in patches.							
42	Fog, sky discernible, has become thinner during past hour.							
43	Fog, sky NOT discernible, has become thinner during past hour.							
44	Fog, sky discernible, no appreciable change during past hour.							
45	Fog, sky NOT discernible, no appreciable change during past hour.							
46	Fog, sky discernible, has begun or become thicker during past hour.							
47	Fog, sky NOT discernible, has begun or become thicker during past hour.							
48	Fog, depositing rime, sky discernible.							
49	Fog, depositing rime, sky NOT discernible.							
50	Intermittent drizzle (NOT freezing), slight at time of observation.	5 Sc not formed by spreading out of Cu.	5 Semitransparent Ac in bands or Ac in one more or less continuous layer gradually spreading over sky and usually thickening as a whole; the layer may be opaque or a double sheet.	5 Ci, often in converging bands, and Cs or Cs alone but increasing and growing denser as a whole; the continuous veil not exceeding 45 degrees above horizon.	5 Ns	5 Drizzle.	5 Five-eighths.	5 Falling, then rising. Now lower than, or the same as, 3 hours ago.
51	Continuous drizzle (NOT freezing), slight at time of observation.							
52	Intermittent drizzle (NOT freezing), moderate at time of observation.							
53	Continuous drizzle (NOT freezing), moderate at time of observation.							
54	Intermittent drizzle (NOT freezing), thick at time of observation.							
55	Continuous drizzle (NOT freezing), thick at time of observation.							
56	Slight freezing drizzle.							
57	Moderate or thick freezing drizzle.							
58	Drizzle and rain, slight.							
59	Drizzle and rain, moderate or heavy.							
60	Intermittent rain (NOT freezing), slight at time of observation.	6 St in a more or less continuous layer and/or ragged shreds, but no Fs of bad weather.	6 Ac formed by the spreading out or Cu.	6 Ci, often in converging bands, and Cs or Cs alone but increasing and growing denser as a whole; the continuous veil exceeds 45 degrees above horizon but sky not totally covered.	6 Sc	6 Rain.	6 Six-eighths.	6 Falling, then steady; or falling, then falling more slowly. Now lower than 3 hours ago.
61	Continuous rain (NOT freezing), slight at time of observation.							
62	Intermittent rain (NOT freezing), moderate at time of observation.							
63	Continuous rain (NOT freezing), moderate at time of observation.							
64	Intermittent rain (NOT freezing), heavy at time of observation.							
65	Continuous rain (NOT freezing), heavy at time of observation.							
66	Slight freezing rain.							
67	Moderate or heavy freezing rain.							
68	Rain or drizzle and snow, slight.							
69	Rain or drizzle and snow, moderate or heavy.							
70	Intermittent fall of snowflakes, slight at time of observation.	7 Fs and/or Fc of bad weather (scud) usually under As and Ns.	7 Double-layered Ac or an opaque layer of Ac, not increasing over the sky; or Ac coexisting with As or Ns or with both.	7 Veil of Cs completely covering the sky.	7 St	7 Snow, or rain and snow mixed, or ice pellets (sleet).	7 Seven-eighths.	7 Falling (steadily or unsteadily). Now lower than 3 hours ago.
71	Continuous fall of snowflakes, slight at time of observation.							
72	Intermittent fall of snowflakes, moderate at time of observation.							
73	Continuous fall of snowflakes, moderate at time of observation.							
74	Intermittent fall of snowflakes, heavy at time of observation.							
75	Continuous fall of snowflakes, heavy at time of observation.							
76	Ice needles (with or without fog).							
77	Granular snow (with or without fog).							
78	Isolated starlike snow crystals (with or without fog).							
79	Ice pellets (sleet, U.S. definition).							
80	Slight rain shower(s).	8 Cu and Sc (not formed by spreading out of Cu); base of Cu at a different level than base of Sc.	8 Ac with sprouts in the form of small towers or battlements or Ac having the appearance of cumuliform tufts.	8 Cs not increasing and not completely covering the sky.	8 Cu	8 Shower(s).	8 Eight-eighths.	8 Steady or rising, then falling; or falling, then falling more rapidly. Now lower than 3 hours ago.
81	Moderate or heavy rain shower(s).							
82	Violent rain shower(s).							
83	Slight shower(s) of rain and snow mixed.							
84	Moderate or heavy shower(s) of rain and snow mixed.							
85	Slight snow shower(s).							
86	Moderate or heavy snow shower(s).							
87	Slight shower(s) of soft or small hail with or without rain or rain and snow mixed.							
88	Moderate or heavy shower(s) of soft or small hail with or without rain or rain and snow mixed.							
89	Slight shower(s) of hail**, with or without rain or rain and snow mixed, not associated with thunder.							
90	Moderate or heavy shower(s) of hail**, with or without rain or rain and snow mixed, not associated with thunder.	9 Cb having a clearly fibrous (cirriform) top, often anvil-shaped, with or without Cu, Sc, St, or scud.	9 Ac, generally at several layers in a chaotic sky; dense Cirrus is usually present.	9 Cc alone or Cc accompanied by Ci and/or Cs, but Cc is the predominant cirriform cloud.	9 Cb	9 Thunderstorm with or without precipitation.	9 Sky obscured, or cloud amount cannot be estimated.	9 Indicator figure. Regionally agreed elements and NOT 'pp' are reported by the next two code figures.
91	Slight rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.							
92	Moderate or heavy rain at time of ob.; thunderstorm during past hour, but NOT at time of observation.							
93	Slight snow or rain and snow mixed or hail** at time of observa.; thunderstorm during past hour, but NOT at time of observation.							
94	Mod. or heavy snow or rain and snow mixed or hail** at time of ob.; thunderstorm during past hour, but NOT at time of observation.							
95	Slight or moderate thunderstorm without hail*, but with rain and/or snow at time of observation.							
96	Slight or moderate thunderstorm, with hail* at time of observation.							
97	Heavy thunderstorm, without hail* , but with rain and/or snow at time of observation.							
98	Thunderstorm combined with duststorm or sandstorm at time of observation.							
99	Heavy thunderstorm with hail* at time of observation.							

Raspodjela oborina

- razmjerna raspodjeli naoblake
- obrnuto razmjerna raspodjeli atmosferskog tlaka
- maksimum oborine u ekvatorijalnom pojasu – tropske kiše
  - dva maksimuma poslije ekvinocija
  - dva minimuma poslije solsticija
- suptropski kraj – najmanje oborina – pustinje
- umjerene širine – količina oborina raste, ciklone
- prema polovima oborina sve manje
- malo oborine gdje su pasati

Raspodjela oborina

- područja monsuna
  - kišno razdoblje ljeti
  - sušno razdoblje zimi
- orogenetičke oborine – ovise o mjesnom reljefu
- izohijete – krivulje s istom raspodjelom količine oborina
- dnevni hod oborina
  - ocean maksimum danju
  - obale maksimum noću
- godišnji hod oborina

Područja vječnog snijega i leda - glečeri

- snježna granica – zemlja nad njom pokrivena vječnim snijegom i ledom
  - Himalaja 30° N, 6000m
  - Norveška 70°N, 900m
  - Arktik/Antarktik i ispod morske razine
- domovina glečera – Labrador, Grenland (led i 2 km)
  - brzina glečera 15-20m/dan
  - na Arktiku se kreću sa morskim strujama, na Antarktiku lutaju
- Praćenje leda – USCG, Ice Patrol, Navtex, Pilot Charts,…

Mjerenje oborina

- litra vode na 1 m^2 = 1mm vode na 1 m^2 = 10cm snijega na 1 m^2
- intenzitet oborine – količina oborine u jedinici vremena
- kišomjer – lijevak
- ombrograf – registrira vrijeme početka i kraja padanja, količine i intenzitet kiše, s plovkom, bilježi se na ombrogram
- snjegomjern – štap ili letva

Uvjeti nastanka oborina

(nema u knjizi!)

1. Postojanje atmosferske vlažnosti (vodene pare) kao posljedica isparavanja
2. Proces kondenzacije uglavnom kao posljedica dinamičkog hlađenja
3. Prisustvo kondenzacijskih jezgri (čvrstih čestica) :

   3.1. Higroskopske čestice (npr. oceanska sol)
   - proces kondenzacije započinje i prije nego što zrak postane zasićen.

   3.2. Nehigroskopske čestice (npr. prašina, čestice dima, pepeo)
   - proces kondenzacije je uvjetovan određenim stupnjem zasićenosti.

Kiša, rosulja

Kiša

- kapi s promjerom većim od 0.5 mm

Rosulja

- oborina u tekućem stanju čije su kapljice manje od 0,5 mm u promjeru, lebde u zraku, padaju iz stratusa

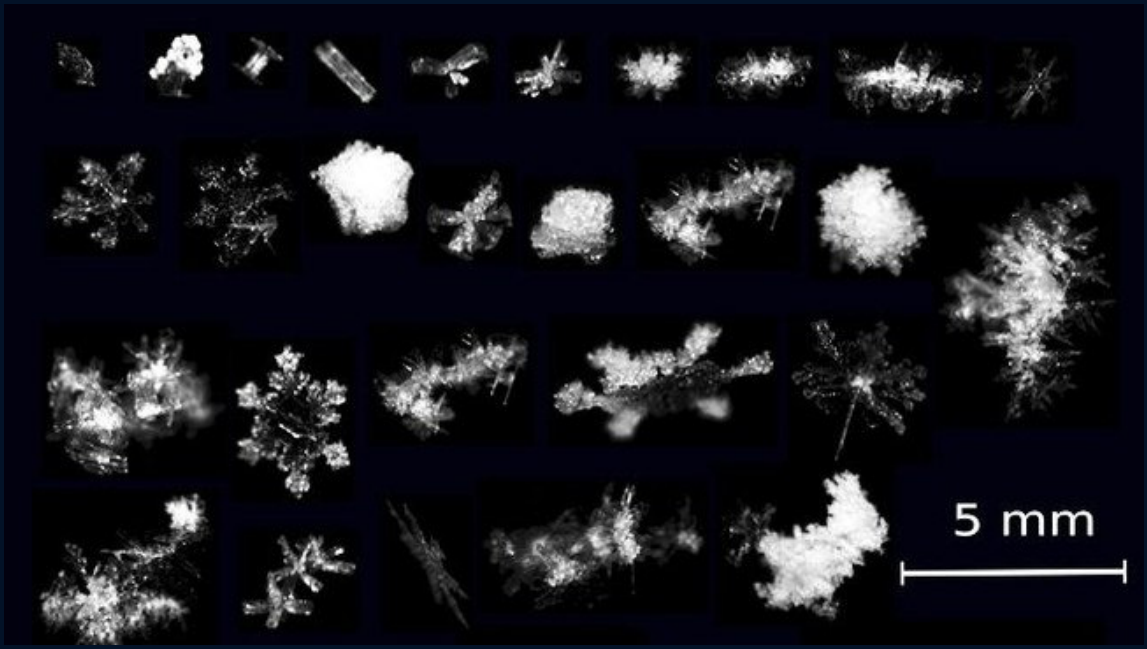
snijeg, susnježica

Snijeg

- od temperature oko -12°C vodena para se kondenzira direktno u sitne ledene kristaliće (t.zv. resublimacija), koji se tada vežu u snježne pahuljice

Susnježica

- mješavina kiše i snijega



solika, tuča

Solika

- zrnca leda nepravilnog oblika veličine 2 - 5 mm, sadrže zrak a mogu nastati zbog snažnih vjetrova u hladnoj fronti

Tuča

- smrznute kapi kiše promjera većeg od 5 mm,
- nastaju od jednog kristala leda kao jezgre i oko nje više slojeva smrznutih ljuski koje nastaju kad se olujni oblaci sretnu sa snažnim okomitim strujama zraka, pa se višekratno stvara oko njih sloj vode koji se zatim smrzne

ROSA, inje

Rosa

- vodena para koja se noću kondenzira na bilju ili predmetima u sitne kapljice

Inje

- vodena para koja se zaledi na biljkama ili predmetima

Ledena kiša

- započinje kao snijeg koji se na putu do zemlje otopi dok prolazi kroz sloj zraka sa temperaturom iznad nule, a potom prođe kroz sloj zraka kojem je temperatura ispod 0 C.
- kapljice ledene kiše se ohlade ispod točke ledišta, ali se ne zalede sve dok ne padnu na predmete sa temperaturom ispod nule (npr. dalekovodi, ceste itd.).
- prilikom zaleđivanja na cestama stvara poledicu.

Magla

Vodena para u atmosferi – Meteorologija – 2.N

Nastanak i vrste magle

- *Magla*
  - sićušne vodene kapljice
  - promjer 0,008-0,060 mm
  - u prizemnim slojevima zraka
  - vidljivost <1km

- *Sumaglica*
  - vidljivost 1-10 km
- pojavljuje se rashlađivanjem vrlo vlažnog zraka temperature blizu rosišta ili povećanjem vlažnosti zraka isparivanjem

Ledena magla

- pri temperaturi <0°C sadrži
  - kapi prehlađene vode (do -30°C)
  - ledene kristale (ispod -30°C)

Smog

- *taloženje kapljica na čestice dima*
- žućkasta
- štetna za zdravlje

Vrste magle

- prema načinu postanka
  - magla zračnih masa
    - radijacijska
    - advekcijska
  - frontalna magla

- klasifikacija po vidljivosti
  - gusta <50m
  - umjerena 50-500m
  - slaba 500-1000m

- mokra magla (vlažna)
  - taloženje kapi na podlogu ili padanje (rosulja, izmaglica)
  - na W obalama kontinenata
- suha magla
  - kapi se ne združuju
  - nema oborine

Radijacijska magla

- nastajanje u stabilnoj i vlažnoj zračnoj masi pri tišini ili slabom vjetru do 3 m/s
- nad kopnom u bilo koje doba godine i geografskoj širini

duge, vedre,

tihe zimske noći

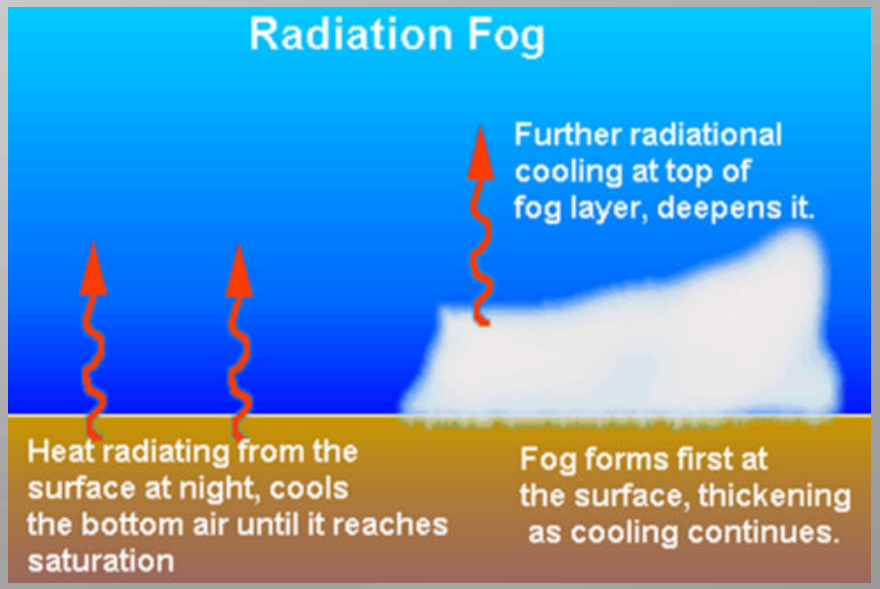
podloga i prizemni sloj zraka gube toplinu zračenjem (radijacijom)

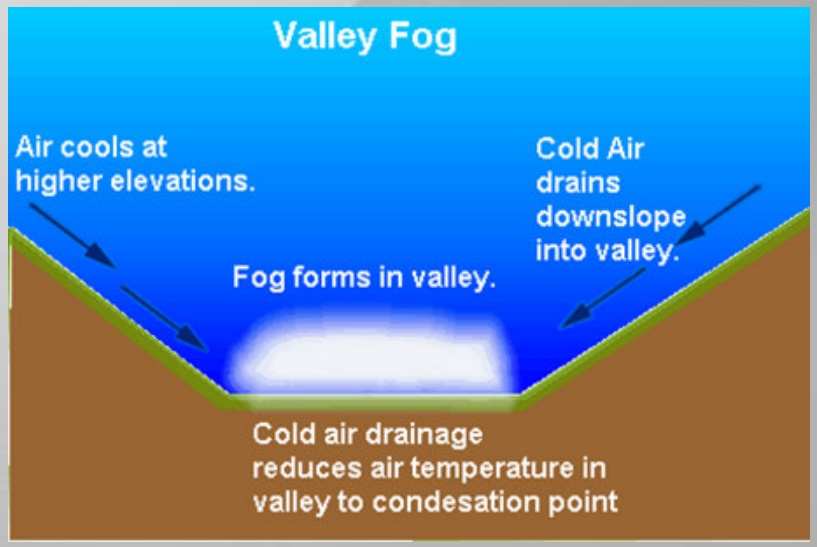
taj se sloj zraka rashlađuje i zasićuje vodenom parom

nastaje *prizemna magla* ili *magla noćnog hlađenja*

Radijacijska magla

- nad morem samo u višim geografskim širinama
- do 200m visine, najčešća zimi, nestaje između 10 i 11 sati
- može se uzdići i pretvoriti u St oblak





- pojavljuje se nad morem kasnije nego nad kopnom
- nestaje prije nad kopnom nego nad morem
- najpovoljnije kotline i uvale

Advekcijska magla (topla advekcija)

Lagano vodoravno strujanje vlažnog toplog zraka iz toplijih predjela u hladnije (vjetar <10 m/s)

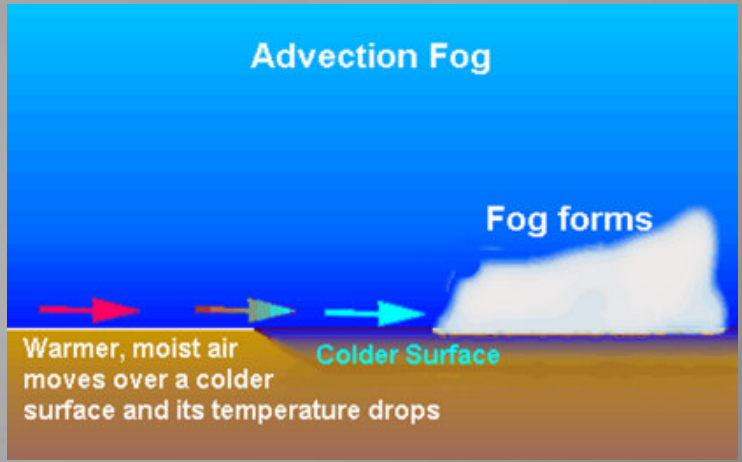
Topli zrak se pri dodiru s hladnom podlogom hladi

Povećava se relativna vlažnost zraka

Kondenzira se vodena para

Advekcijska magla – najpovoljniji predjeli

- primorska područja
  - zrak bogat vodenom parom
  - temperaturne razlike između kopna i mora najveće
  - *obalna magla*
- morska područja
  - sukob hladne i tople morske struje
  - *morska magla*
- otvoreno more
  - strujanjem tropskog zraka u više širine
  - u hladno doba godine
  - *magla tropskog zraka*



Advekcijska magla

- advekcijska ljetna magla
  - Newfoundland (Grand Banks)
  - Britanski otoci
  - Kurilski otoci
  - California (S. Francisco →)
  - područje sudara
    - tople Golfske i hladne Labradorske struje
    - tople Kuroshio s hladnom Kamčatkanskom strujom
- *hladna advekcija*
  - strujanje hladnog zraka preko tople podloge
  - *arktički morski dim*

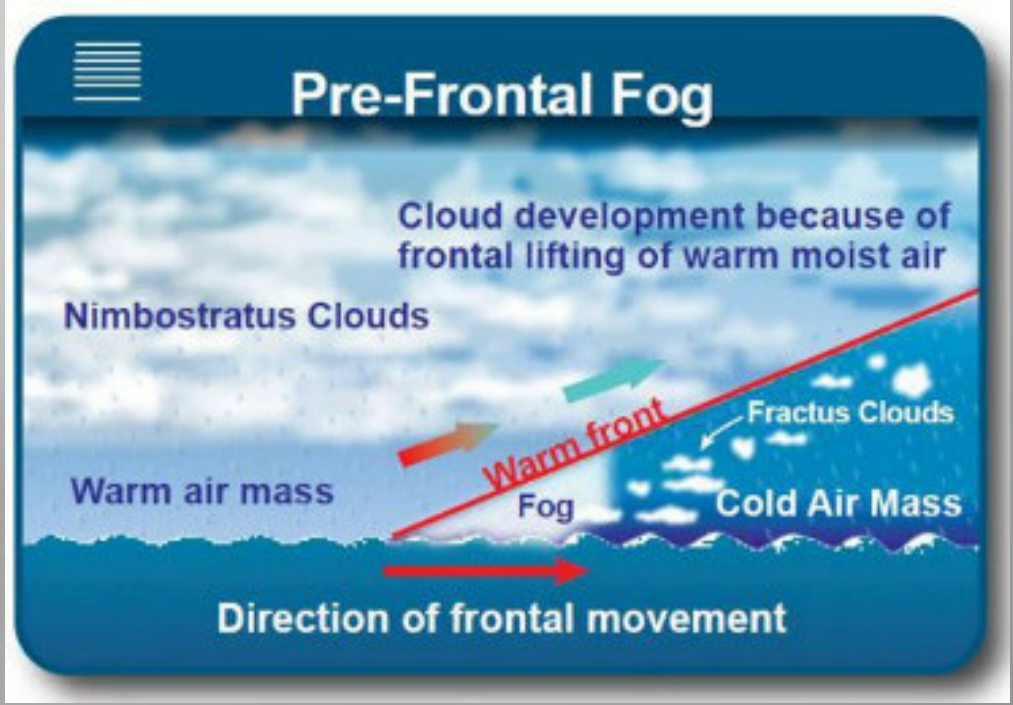
Advekcijsko-radijacijska magla

nastaje zimi

- vlažna zračna masa prelazi iz toplijeg područja u hladnije
- kada vlažan morski zrak dođe na hladno kopno pa se ohladi
- nije gusta, traje kratko

Ostale vrste magli

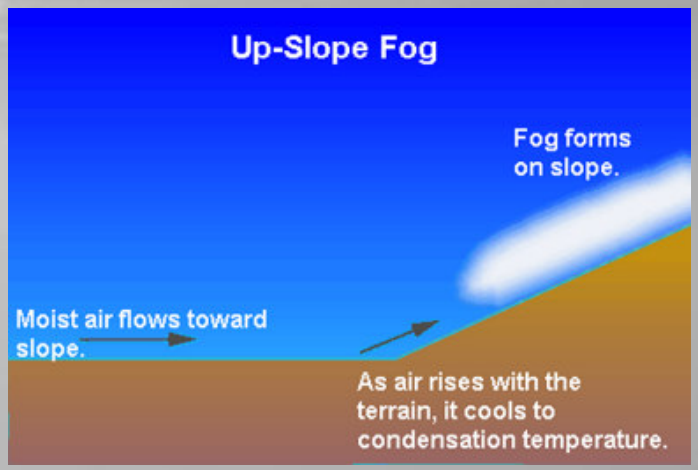
- Frontalna magla
  - na graničnoj plohi (fronti) između vlažne tople i hladne zračne mase
  - usko područje tople fronte ili fronte okluzije iznad mora u srednjim i visokim zemljopisnim širinama



- Magla isparivanja
  - jesen, zima pri prolazu hladnijeg zraka preko toplije vodene ili kopnene površine koja se naglo isparava
  - kratkotrajna

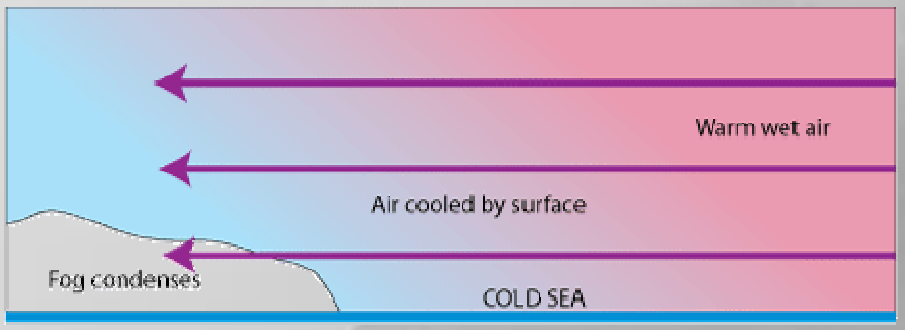
Magla na padinama (nema u knjizi)

- *upslope fog*
- lagani vjetar tjera vlažni zrak prema gore (brdo, planina)
- na određenoj visini dolazi do zasićenja i dolazi do kondenzacije

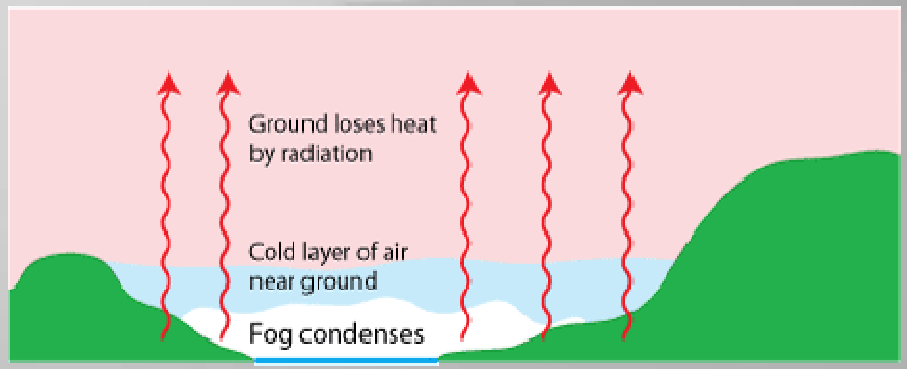


Ponavljanje

Advekcijska : Radijacijska



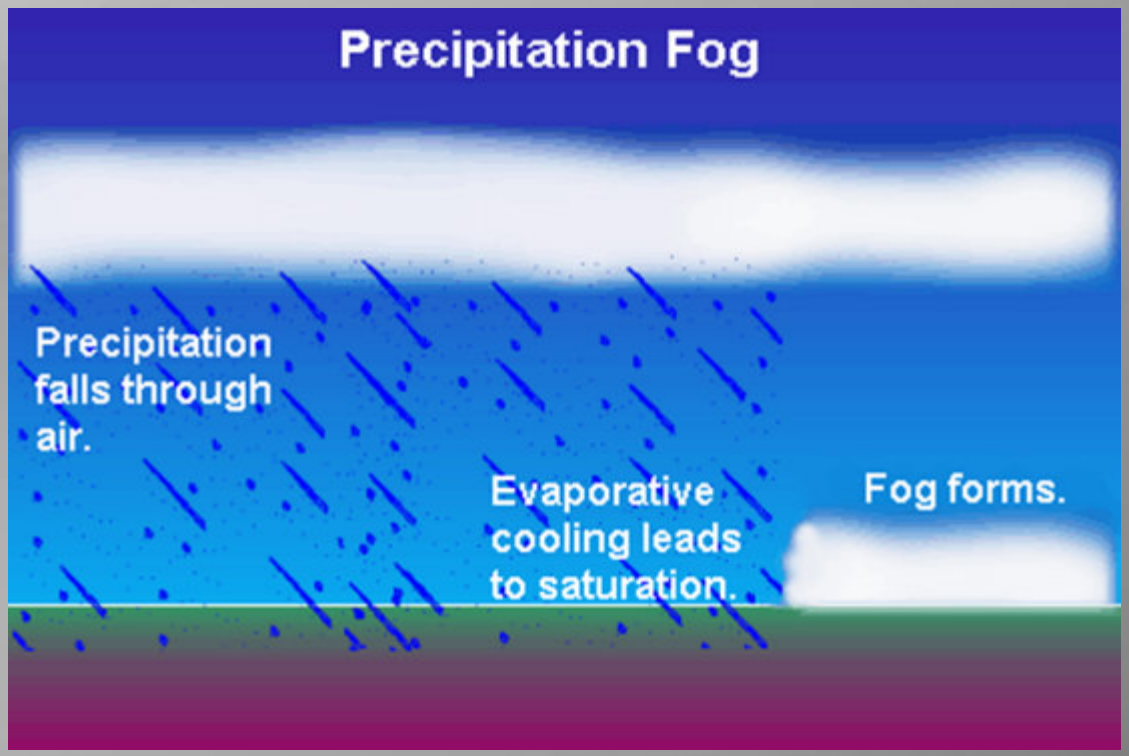
Advection - fog caused when warm wet air flows over a cold surface



Radiation - ground cools by radiation, and fog forms as the air cools

Figure 10

Frontalna magla



Ponavljanje

Radijacijska magla

Advekcijska magla

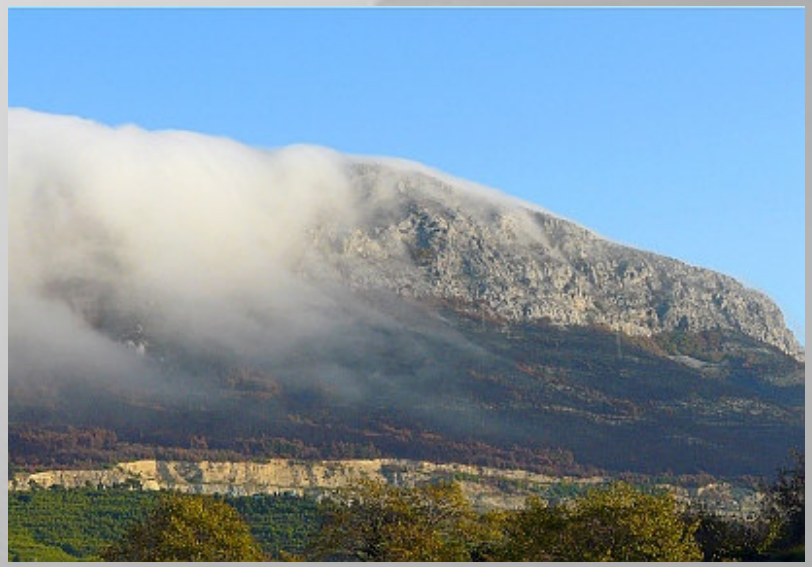
Ponavljanje

Predfrontalna magla

Morski dim

Fenomen: Magla se slijevala niz padine Kozjaka

- subota, 06.studenog 2010.
- stabilna subota počela je nešto svježijim jutrom u odnosu na prethodne dane.
- minimalna temperatura zraka u zagori bila ispod 5°C.
- u otoku pored sinja je izmjereno 3°C.
- uz obalu su minimalne temp. bile od 9 do 13°C.



- tijekom jutra Splićani su mogli promatrati fenomen prelijevanja magle preko Kozkaja.
- hladan zrak na visoravni Kozjaka zadržavao je maglu koja se poput slapova prelijevala južnim padinama planine,
- dok se zrak spušta se zagrijava pa magla "ispari" dok dođe do podnožja.

Novi fenomen s maglom: Condo Effect Fog (CEF)

- vlažni zrak iz Meksičkog zaljeva se diže iznad zgrada i kondenzira radi dizanja

- moist air off the Gulf of Mexico flowing over the buildings and condensing as it is lifted

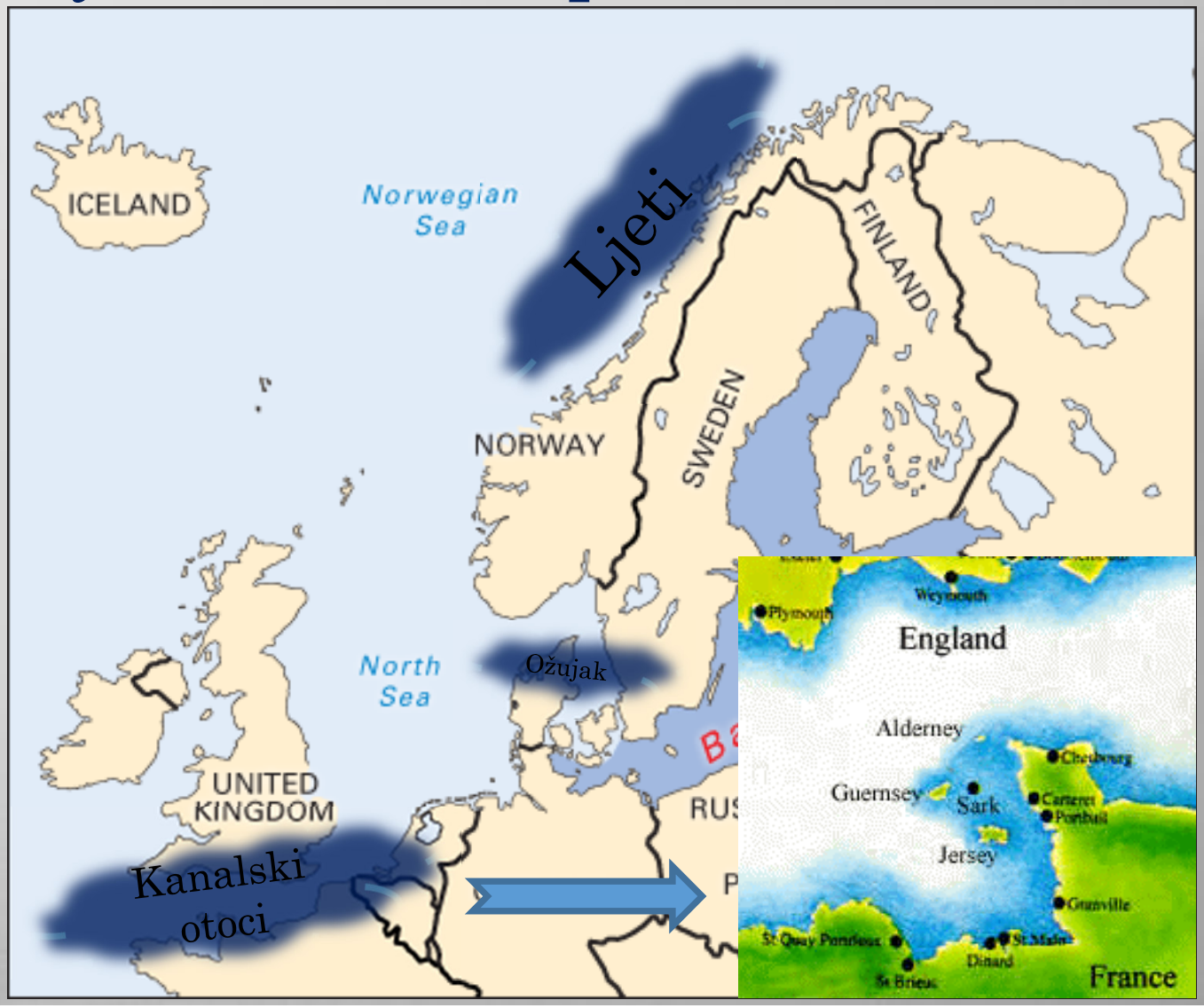
Raspodjela magle na Zemlji

- na oceanima i morima najviše u toplo doba godine
  - more hladnije od kopna
- nad oceanima gotovo uvijek advekcijska, a može biti i frontalna
- razvoju magle pogoduju:
  - topli zrak preko hladnog moraili kopnom
  - sjecišta toplih i hladnih morskih struja
  - anticiklone
  - gibanje toplog zraka prema višim geografskim širinama
- Atlantski i Tihi ocean slični,
- u Indijskom oceanu magla ne ometa bitno promet na moru

Magla u Atlantskom oceanu

- između 40°N i 30°S je učestalost magle 1%
- oko 50°N najveća učestalost između 40°W i 60°W i oko Newfoundlanda (Grand Banks)

Sjeverna Evropa



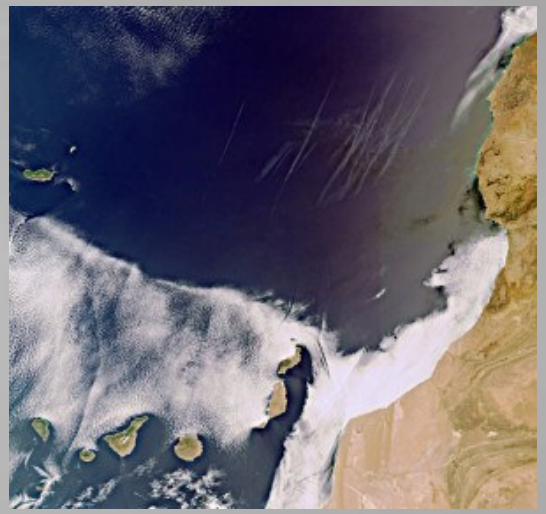
- Norveška i Sjeverno more ljeti
- Skagerak u ožujku
- Kanalski otoci (magla+m.mjene)

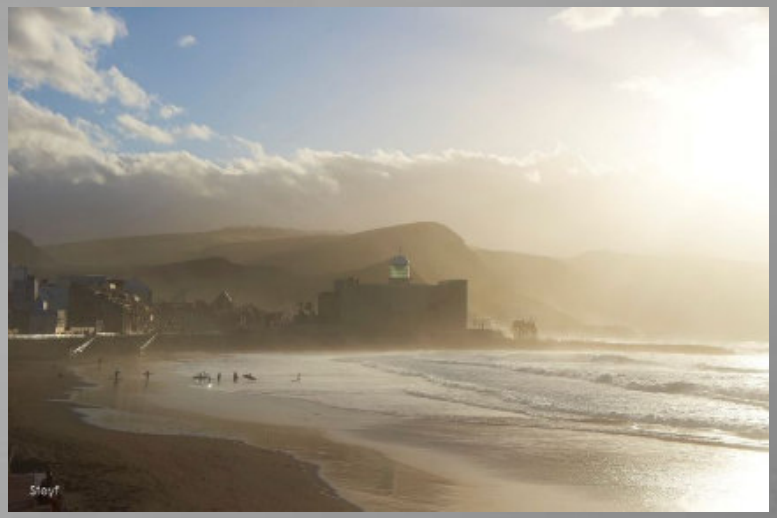
Portugal

- Ljeti visoka magla
- Mærsk Mc-Kinney Møller trenutno najveći kontejneraš na svijetu 18000TEU
- TripleE:
  - Economy of scale
  - Energy efficiency
  - Environmentally improved

Maroko do Sierra Leonea

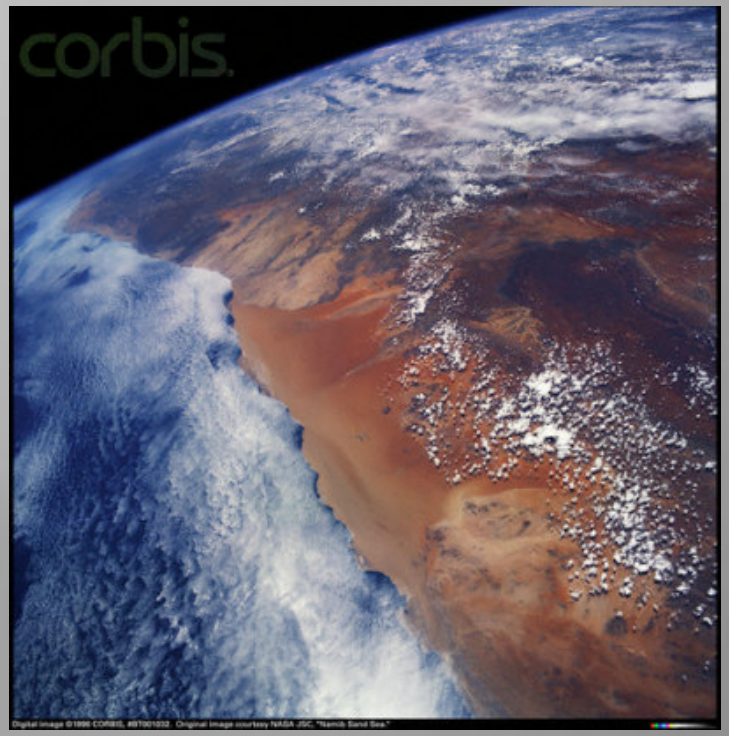
➢kasna jesen i zima, ujutro





Atlantik

- Južna Afrika, Namibija
- Kanarska i Benguelska struja
- svakodnevno, zimi
- može se mjeriti kišomjerom
- donosi maglu i u pustinju Namib



Patagonija – Cape Horn

Rio de Janeiro

učestalost zimi 30%, ljeti 65%

Panama

- Novi fenomen s maglom: Condo Effect Fog (CEF)
- vlažni zrak iz Meksičkog zaljeva se diže iznad zgrada i kondenzira radi dizanja

Mississippi

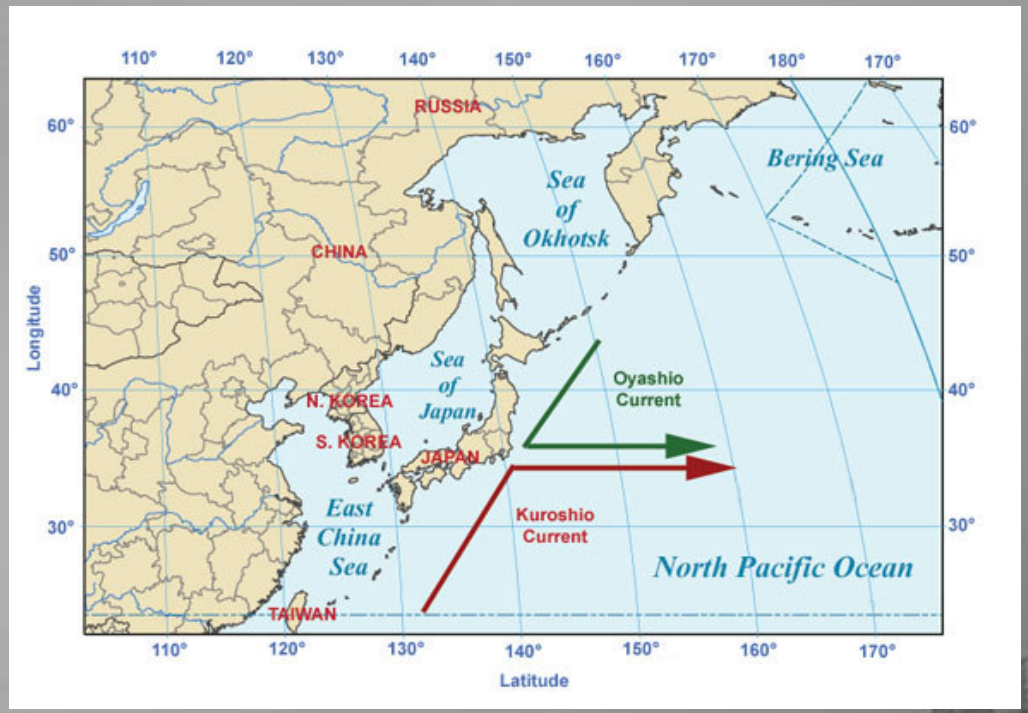
- na ušću rijeke
- granica magle je granica riječne vode s Golfskom strujom

Cape Hatteras

- Sjevernije od Rta Hatteras magle su gušće
- područje prikladno za okluziju fronte

Tihi ocean

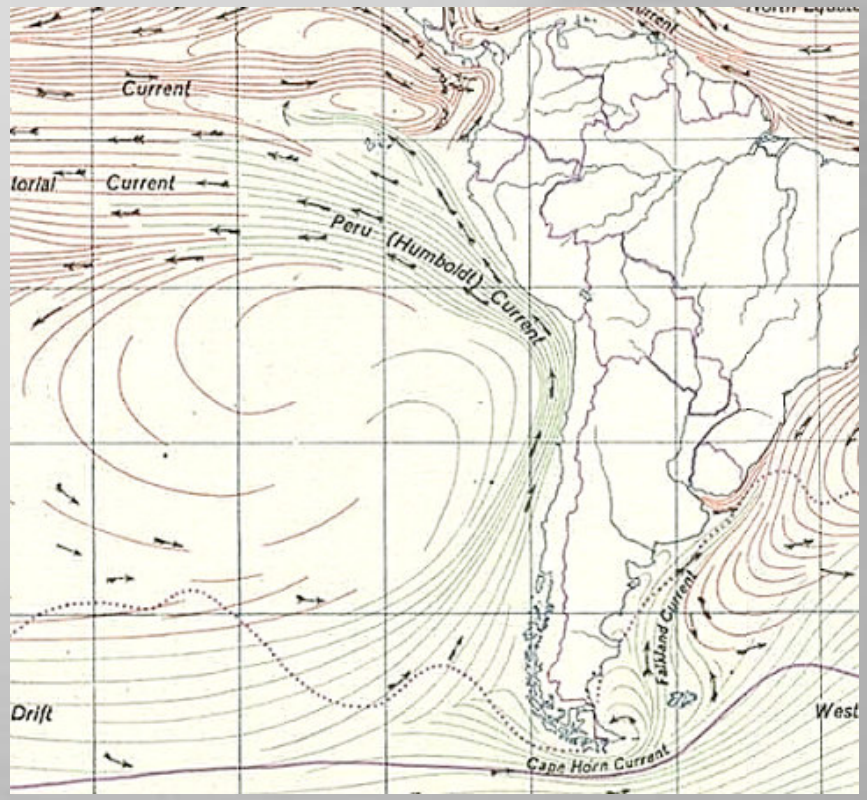
- Kurilski otoci, Aleuti – sudar hladne Oyashio i tople Kuroshio struje



Point Reyes, California

Peru – Humboldtova hladna struja

Peru i Čile – najmaglovitiji na Zemlji



Kanada – kolovoz, rujan

Beringovo more – ljeti

Hong Kong

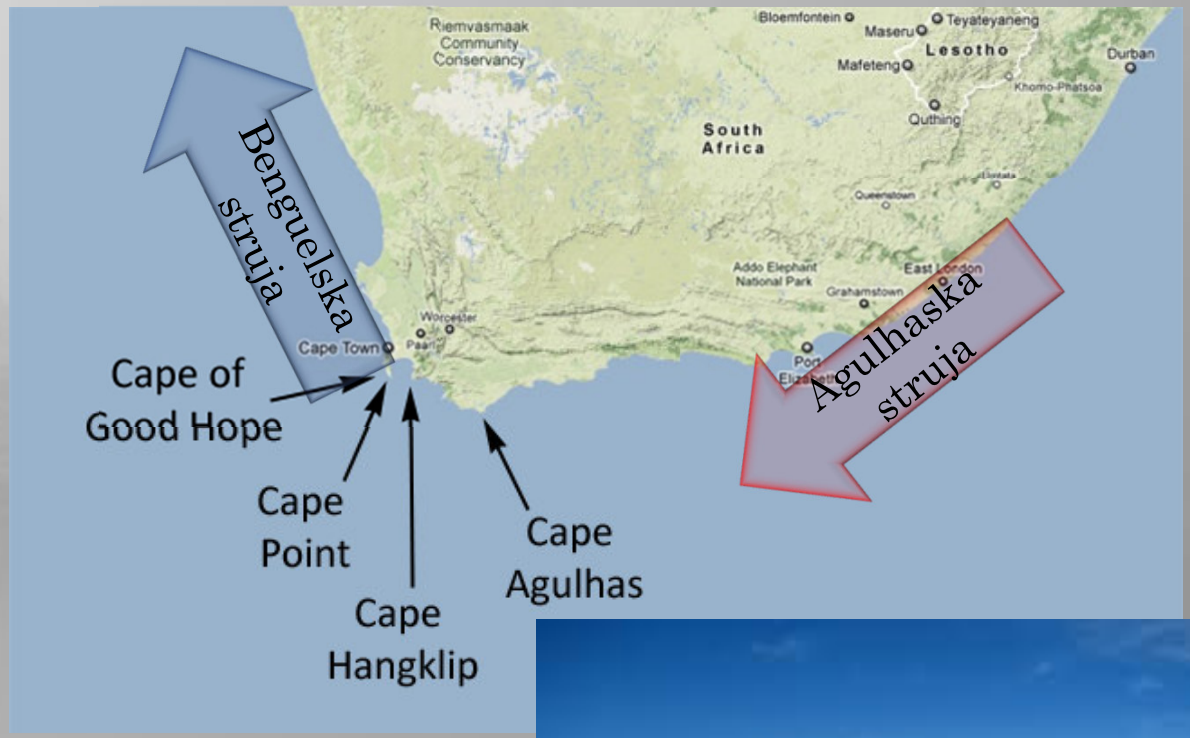
- od veljače do travnja oko 38 dana magle

Indijski ocean

- malo magle u Australiji koja ne ometa plovidbu
- crvena magla snimljena 11.1.2013.

Agulhaska struja

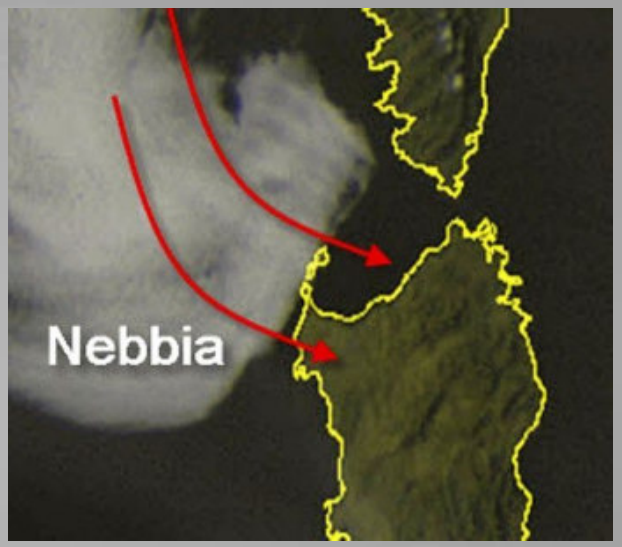
- Agulhaska struja
  - česta kiša i oluja, rijetka magla
- Benguelska struja
  - česta magla, rijetka kiša i oluja



→ mjesto susreta A. i B. struja

Sredozemno more

- istočni dio
  - blizu obale, uz južni vjetar
  - travanj, do podneva
- zapadni dio (Gibraltar), Korzika, Sardinija
  - ljeti (lipanj)
  - gusta i suha magla
  - kratkotrajna
- Tirensko more - rijetko



Jadransko more

- češće na sjeveru
  - Venezia (vjetrom do Istre)
  - albanska nizina
- najčešća zimi (Istra)
  - *jutarnja magla*

Morski dim

- plitki sloj ledene sumaglice ili magle
- tik uz površinu otvorenog mora
- vrlo niska temperatura zraka
- rezultat sublimacije vodene pare u zraku
- temperaturna razlika mora i zraka barem 12°C
- *arktički morski dim (frost smoke)* →→→
- područje Newfoundlanda i St. Lawrence
  - lokalno vrlo opasna za plovidbu
  - *ledena kristalna magla (ice crystal fog)*
- mnogi ga zamjenjuju za *morsku prašinu* (kod turbulentnog vjetra)

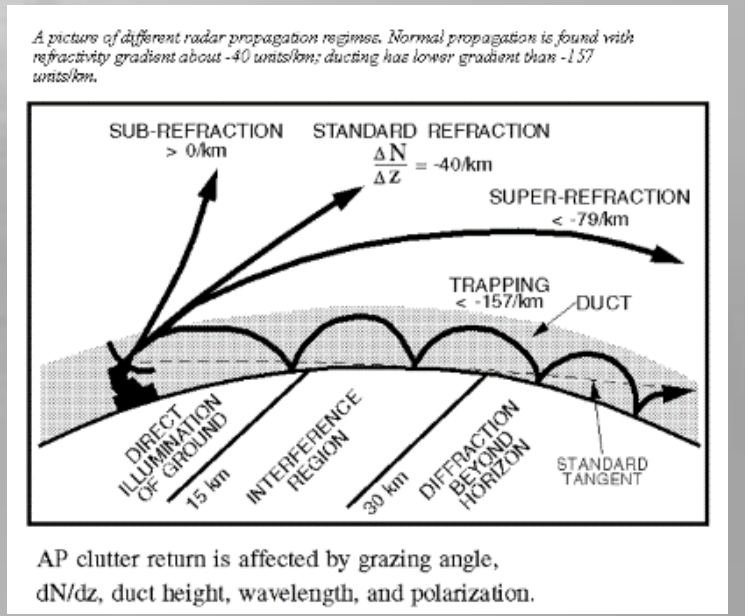
Uporaba radara u magli

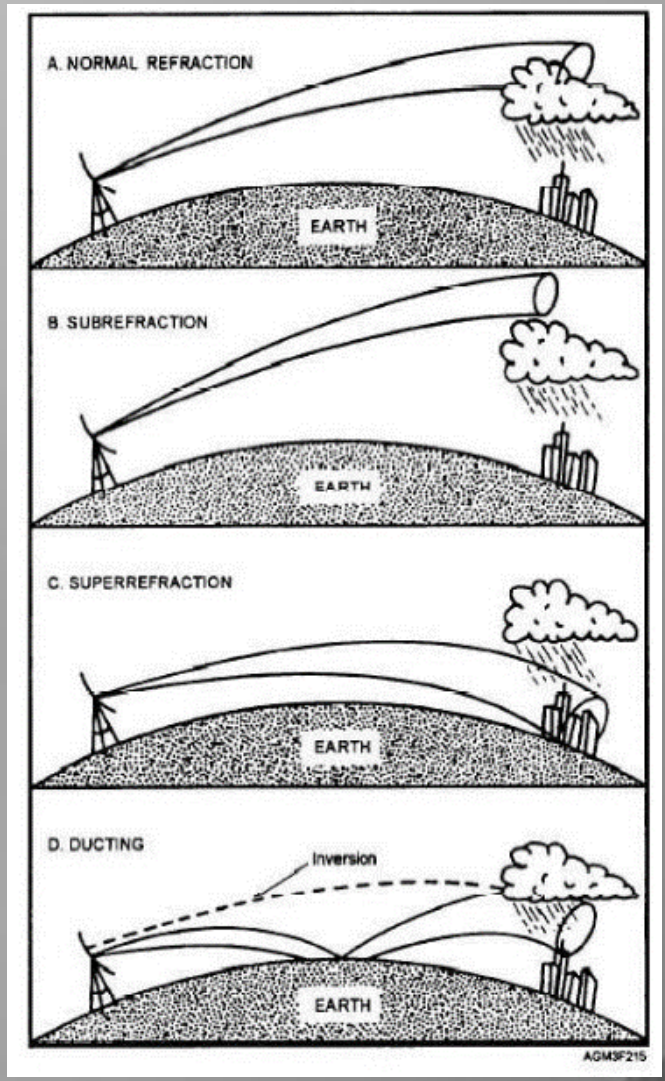
optimalni domet

- 1013 hPa;
- +15°C na razini mora;
- relativna vlaga 60%

slabljenje dometa

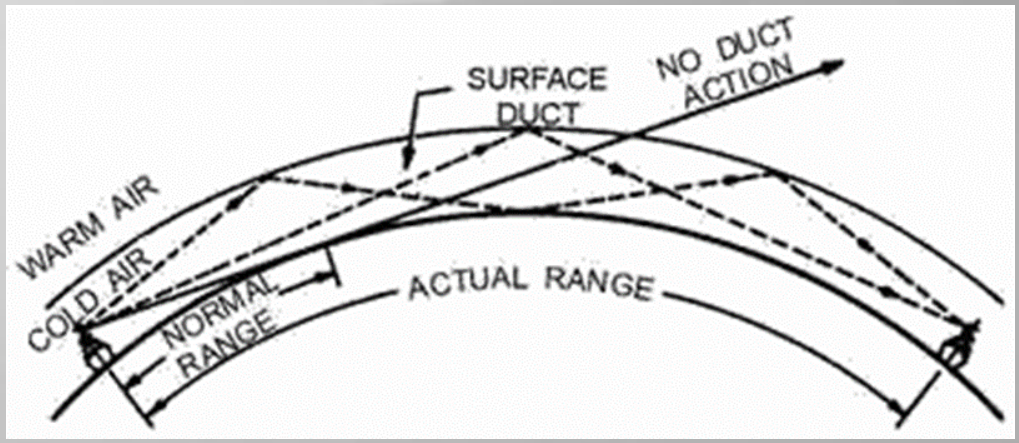
- najveće pri gustoj kiši
- manji pad pri susnježici
- najmanje smeta magla





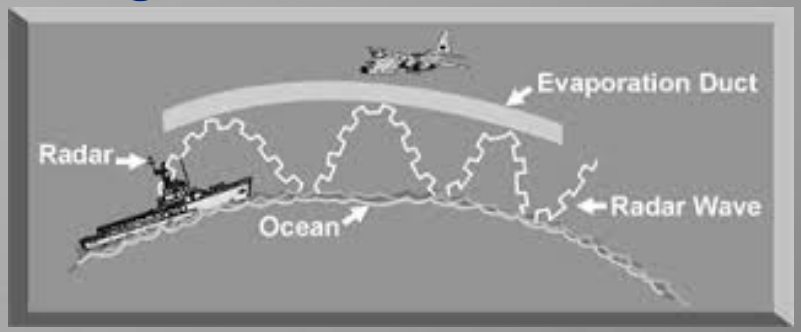
Subrefrakcija

- smanjen domet
- pad temperature po visini veći od uobičajenoga
- vlažnost zraka raste po visini
- temperatura zraka barem 5,5°C niža od temperature mora



Superrefrakcija

- povećan domet
- pad temperature po visini manji od uobičajenoga
- vlažnost zraka pada po visini
- temperatura zraka viša barem 5,5°C od temperature mora
- višestruka superrefrakcija - ducting



Sudar Andrea Doria - Stockholm